# International Conference on

# Open Access Sources and Information Services during Post-Covid Times: Challenges and Opportunities




## 67th ILA CONFERENCE PROCEEDINGS

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Dravidian University Library,
Kuppam, Adhra Pradesh
Indian Library Association (ILA),
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Vijayawada

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**(Volume I & II)**

**March, 24-26, 2022**

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**67th ILA International Conference on "Open Access Sources and Information Services during Post-Covid Times: Challenges and Opportunities (Volume -I & II)**

**by Prof. B. Ramesh Babu**

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**Prof.Tummala Ramakrishna**
M.A., M.Phil., Ph.D.
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## *Foreword*

It is happy to note that the Dravidian University Library in association with the Indian Library Association (ILA) and Andhra Pradesh Library Association has planned an International Conference on **"Open Access Sources and Information Services during Post-Covid times: Challenges and Opportunities"** during 24-26 March 2022. Although the university environment has suffered due to Covid pandemic, yet our university has come forward to host this conference physically and provided necessary infrastructure and facilities for the smooth conduct of this mega event. Our Library staff has taken efforts for the planning and preparation to host the 67th Annual Conference of the Indian Library Association, 2022. I am glad that the organisers of the conference are bringing out a pre-conference volume.

As observed from the Table of Contents of the Pre-conference proceedings, I understand that a total of 130 papers from across the country have been submitted and the Editors have systematically grouped them under various sub-themes within the framework of the main theme. The subthemes represent the various dimensions of Open Access sources and information services to be provided.

I congratulate the organisers of this conference on choosing a timely and appropriate topic. I also thank the paper presenters for sharing their thoughts and experiences on such an important subject. I am sure the ILA and APLA teams, the delegates and the invitees will find this greenery campus which would provide more conducive environment for their brain storming technical sessions and generate feasible and workable resolutions for the development of the profession in the direction of using Open Access sources and provide information services especially in the present post-Covid times.

I wish the Conference a Grand Success

**15-03-2022**

**Kuppam**

**PROF. TUMMALA RAMAKRISHNA**

15/3


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## PREFACE

In the present digital environment, the process of scholarly communication has been changed on par with the emerging digital communication, technologies and virtual network among the scholars. The Open Access (OA) movement is one among the many factors contributing in the information generation and dissemination. Libraries are supporting OA publications in the provision of information services and the use of these sources are more seen during pre-COVID pandemic environment and it continues even after that period. OA publishing provides free access to scholarly literature available over the internet and it has gained sufficient moment in the recent years. Accordingly, a sizeable quantum of OA literature is being available on the web domain. Here lies the role of library professionals to advocate and propagate the use of such literature and shall bring to the knowledge of the clientele. Keeping these aspects in mind the Indian Library Association (ILA) in association with the Dravidian University Library, Kuppam, (A.P) and Andhra Pradesh Library Association (APLA) has planned to conduct an International Conference on **"Open Access Sources and Information Services during Post-Covid times: Challenges and Opportunities"** during 24-26 March 2022 at Dravidian University Campus,Kuppam. This conference marks the 67th Annual conference of the Indian Library Association, New Delhi.It is hoped that this international conference would pave the way as an academic platform to discuss, debate and deliberate issues, challenges and opportunities concerned with the OA initiatives and developments and the provision of information services during the post-COVID times.

This conference has been planned with the following objectives:

1. To trace the Open Access (OA) initiatives in various countries and to bring out the trends and developments in this regard;
2. To identify the various Open Educational Resources available and survey their utilization in libraries;
3. To trace the OA tools and services and to discuss their selection and evaluation criteria;
4. To identify the Free and Open Source Software (FOSS) and their application in Libraries;
5. To discuss the various Information Services provided during Post COVID times and examine the role of Libraries in promoting OA;
6. To bring out the role of Institutional Repositories, Electronic Theses and Dissertations (ETDs) and Digital Libraries including Consortia during Post COVID times; and

7. To survey the user perception on OA sources and to discuss the implications of Intellectual Property Rights (IPR) regulations in connection with the use of OA sources.

A total of 130 papers have been included in the Pre-conference in two volumes and logically grouped under **nine** sub-themes as follows:

Volume I

| | |
|---|---|
| Theme 1 | Open Educational Resources |
| Theme 2 | Open Access Tools and Services |
| Theme 3 | Information Services and COVID-19 |

Volume II

| | |
|---|---|
| Theme 4 | Metric Studies on OA Sources |
| Theme 5 | Information Seeking Behavior and Open Access Sources |
| Theme 6 | Open Access & Scholarly Communication & Free and Open Source Software |
| Theme 7 | Digital Libraries, IRs &Application of ICT |
| Theme 8 | Information Literacy, Best Practices and others |
| Theme 9 | Plagiarism, IPR & Library Management |

From the Table of Contents one can witness that the papers have been contributed from different parts of the country representing the above nine subthemes of the main theme namely 'Open Access Sources and Information Services during Post-Covid times'. The papers to this pre-conference volume have been contributed by the experienced practicing library and Information professionals working in academic, public, technical, and other libraries, LIS faculty and research scholars.

The Editors thank and congratulate all the contributors who have responded spontaneously by contributing the articles in spite of the hardships prevailed during the post- Covid Pandemic environment. Further the Editors states that the views expressed in these papers are of the respective authors only. The Indian Library Association, Dravidian University and other host organisationsor the Editors are no way responsible for the thought content of the articles. The Editors take this opportunity to thank the Indian Library Association, New Delhi and the Organising Secretary of this conference for entrusting the Editorial responsibility of the pre-conference volume. We thank profusely **Professor Tummala Ramakrishna, Vice-Chancellor, Dravidian University, Kuppam,** (Andhra Pradesh) who wrote the Foreword to this pre-conference volume in a befitting manner.

The Editors have taken all the possible efforts to maintain the standard and quality of the conference volume without affecting the thought process and ideas of the contributors. Finally, the Editors thank all the organisers, international and national committee members for their support and encouragement and make this international conference a successful event. It is hoped that, this pre-conference volume will be an addition to the literature in Library and Information Science.

It is earnestly hoped that the deliberations at this international conference would be promising and rewarding for the delegates and more particularly the pre-conference volume would be a useful source of reference to the LIS professionals including students, faculty and researchers. Editors wishes to have pleasant and stimulating interactions and fruitful meeting with the delegates during the conference towards providing information services by using the Open Access sources in the post-Covid environment and provide the blue print for future endeavour. Let us work collectively to make the LIS profession a thriving, dynamic and noble profession to achieve the blissful and bright future.

**14-03-2022**
Chennai

**Prof. B. Ramesh Babu**
***Editor -in-Chief***

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# KNOWLEDGE MANAGEMENT IN THE OPEN ACCESS MOVEMENT
## Prospects and Challenges during Post COVID19

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### ACADEMIC LIBRARIANSHIP IN THE PANDEMIC COVID19

"Pursuit of integral knowledge and liberation, which has been a constant endeavor of Indian culture, is also the central objective of education". Education is also visualized as an evolutionary force so that each individual is enabled to evolve from purely material consciousness towards superior planes of intellectual and spiritual consciousness. Education is also perceived as a bridge between the past, present, and the future and as a means by which the best of the heritage is transmitted to the new generations for its further progression (Joshi 1998). The objective of Indian higher education is not only to promote equality and social justice, but also to provide the right kind of work ethos, professional expertise and leadership in all walks of life to foster among teachers and students and, through them, society in general--integral development of values inherent in physical, emotional, rational, aesthetic, ethical and spiritual education (Joshi, 2002). To achieve this, a well-established library is essential for any academic and research institution to support teaching, learning, and research. Thus, Library and Information Services in the academic and research institutes occupy central role in enhancing the quality of learning, teaching and research activities.

The Pandemic COVID19 has been one of the greatest challenges that we never experienced before especially academic libraries. The Corona virus is sweeping its way around the world and its impact is only beginning to be visible. It is evident that its arrival is changing and influencing everything in all spheres of life and education is not an exception. The news, both print and electronic media, is full of stories about the need to reduce social contact and stay at home is a safe means. The widespread of this deadly disease has necessitated the governments to take certain strict measures to prevent its further spreading. The measures include closing of all educational institutions including libraries, airports, rail and road transports, restricting on the social gatherings and propagating to observe social distancing and restricting of certain services by the governments.

Open Access has become an order of the day especially under Pandemic COVID19 and a new norm in learning, teaching, scholarship and research. Institutional repository

being an integral component of open access occupies significant role in collecting, organizing and preserving the intellectual output of a university to encompass scientific, technological, cultural, artistic, and historical materials.

## IMPACT OF COVID-19 ON ACADEMICS

India's education system is impaired, and students are unable to follow their regular academic routines. "The spread of COVID-19 has forced many educational institutions across the globe to close campuses. India has over 37 million students enrolled in higher education. An interruption in the delivery of education could cause long term disruption. The pandemic requires universities to rapidly offer online learning to their students. Fortunately, technology and content are available to help universities transition online quickly and with high quality," says Raghav Gupta, Managing Director (India and APAC), Coursera(The New Indian Express, dated 21st March 2020).

IFLA (2020) states that Libraries around the world are facing hard choices around which services to offer and how, ranging from minimal restrictions to full closure. The governments themselves are taking different approaches, sometimes ordering the closure of all institutions, others indicating that life should continue as usual, and others simply leaving decisions up to library directors. Libraries in India are facing very different situations, from broadly maintaining a full service to complete closure. Libraries especially attached to higher education institutions have been working hard to provide access to collections and services remotely. Many libraries are seeing a major increase in interest in digital resources. Beyond this, there are many great freely available resources available with educational materials – notably Open Education Resources Commons, which provides access to materials curated by a team of librarians. UNESCO's Education Division is also providing links to valuable educational resources. But at the same time, with libraries and library associations closing offices, many in the library field are facing challenges around how to manage remote working effectively.

Although globally, online education has met with some success but in India, we still have a long way to go before digital learning is seen as mainstream education. But many higher education institutes in India are not equipped with such facilities. Remote learning increasingly relies on the reliable power supply and ubiquitous Internet connectivity. Many rural students lack the internet connections or hardware to learn remotely. Lack of access to technology or fast, reliable internet access can prevent students in rural areas and from disadvantaged families and having good internet connectivity is an obstacle to continued learning, especially for students from disadvantaged families. Online learning appears to be no substitutes for field trips, academic exchanges and the social and cultural attractions of vibrant campus life. E-learning is likely to witness a high dropout rate due to lack of atmosphere for

studying. Students might tend to get distracted by gaming consoles, social media at home and might not feel a sense of community while taking online classes. Teaching and learning online is somewhat more successful in higher educational contexts. But, compared to the Massive Open Online Courses (MOOCS), a blended-model of online (asynchronous) teaching and learning utilizing LMS platforms (such as blackboard or Moodle) and, on-campus (synchronous) classroom interactions are more effective.

**KNOWLEDGE MANAGEMENT IN THE OPEN ACCESS MOVEMENT**

It was Dr S R Ranganathan, Father of Library and Information Science, who proclaimed the concept of open access movement, when he found that the books are kept under locking system and were chained and felt privilege of a few. This has led to the first law `Books are for use'. In the digital environment, efforts to provide access to the digital content to the user community under network environment and even through remote access serves the philosophy of open access. Satija and Singh (2007) enumerated the implications of the five Laws with respect to the ubiquitous Internet, Electronic publishing, Information Literacy, Virtual Reference Desks, Open Access Archives, Information Transfer, Knowledge Management,Information Marketing, OPACs and Hypermedia and reiterated that all the new concepts and processes facilitate the implications of the five Laws which square well with the IT enabled services and information society. It would be needless to mention that the ideas of Dr S.R. Ranganathan's transformed to reality to form the Budapest Open Access (OA) initiative during 2001 to make the academic and research literature of all disciplines made available freely on the Internet.

Libraries have applied knowledge management principles to provide effective library services and user satisfaction.Now days; there has been a significant advancement in information communication technology which offered new possibilities to the knowledge management process in libraries to enhance knowledge management methods and sources such as digital library, internet, library consortia and expert system. National Knowledge Commission has emphasized the expected role of librarian in changing society so that the professionals can work closely with the academic activities to develop effective learning environment, through information literacy projects and online. As the needs of clients are constantly changing, developing new services, delivering sources to the clients will continue to be a real challenge.

Students and teachers can use these OA resources for teaching and learning while accessing from home. OA facilitates the researchers to access freely available literature without any restrictions. It also provides the opportunity to publish and have wider visibility, discoverability, and usage of research findings. Access to scholarly and scientific literature is a common problem of all developing countries due to limited resources. OA resources increase the availability of open resources for

students, teachers, researchers, and common people. Libraries can also provide their services by creating awareness of OA resources and their associated benefits.
The open-access model provides great opportunities not only for libraries, students, teachers, and researchers but also for universities to use and support the OA movement and have wider visibility of their research and researchers' profiles. Universities can invest in this model by supporting financially their researchers to publish through the OA model and creation library research repositories based on OA research.

| No | Resources with URL | Contents |
|---|---|---|
| 1. | Directory of Open Access Journals (DOAJ) https://doaj.org/ | Access to free 14,452 Journals, 11,457 searchable at Article level 133 Countries and 4,768,578 Article |
| 2. | Directory of Open Access Books https://www.doabooks.org/ | Free access to 27660 Academic peer-reviewed books from 379 publishers |
| 3. | National Programme on Technology Enhanced Learning (NPTEL) https://nptel.ac.in/ | Online web portal http://nptel.ac.in – more than 471 million and more than 56000 hours of video content |
| 4. | e-ShodhSindhu Consortia https://ess.inflibnet.ac.in/ | Current as well as archival access to more than 10,000 core and peer-reviewed journals and a number of bibliographic, citation and factual databases in different disciplines from a large number of publishers and aggregators to its member institutions including centrally-funded technical institutions, universities and colleges that are covered under 12(B) and 2(f) Sections of the UGC Act |
| 5. | Shodhganga-a reservoir of Indian Theses https://shodhganga.inflibnet.ac.in/ | The Shodhganga@INFLIBNET Centre provides a platform for research students to deposit their Ph.D. theses and make it available to the entire scholarly community in open access. |
| 6. | e-PG Pathshala https://epgp.inflibnet.ac.in/ | It is an initiative of the MHRD under its National Mission on Education through ICT (NME-ICT) being executed by the UGC. The content and its quality being the key component of education system, high quality, curriculum-based, interactive e-content in 70 subjects across all disciplines of social |

| | | |
|---|---|---|
| | | sciences, arts, fine arts and humanities, natural & mathematical sciences, linguistics and languages. |
| 7. | Open Access Thesis & Dissertationshttps://oatd.org/ | OATD currently indexes 5,039,477 theses and dissertations |
| 8. | Legal Information Institute of India http://liiofindia.org/ | Free, independent and non-profit access to 159 databases of Indian law |
| 9. | PubMed Central (PMC) https://www.ncbi.nlm.nih.gov/pmc/?cmd=search&term | Fee full-text archive of biomedical and life sciences journal literature at the U.S. National Institutes of Health's National Library of Medicine (NIH/NLM) |
| 10. | Project Gutenberg https://dev.gutenberg.org/ | **Project Gutenberg** is a library of over 60,000 free eBooks. |
| 11. | AGRIS http://agris.fao.org/agris-search/index.do | The AGRIS database contains 11,714,169 records ( including 1,528 datasets ) from 460 data providers |
| 12. | ScienceDirect Open Access Contenthttps://www.sciencedirect.com/#open-access | Over 1.2 million articles on ScienceDirect are open access |
| 13. | Cambridge University Press https://www.cambridge.org/core/what-we-publish/open-access | At Cambridge University Press, Open Access submissions are accepted in more than 350 of our journals |
| 14. | SWAYAM ONLINE https://swayam.gov.in/) | The courses hosted on SWAYAM are in 4 quadrants – (1) video lecture, (2) specially prepared reading material that can be downloaded/printed (3) self-assessment tests through tests and quizzes and (4) an online discussion forum. Refresher and Orientation courses are valid and recognized. |
| 15. | SWAYAM PRABHA – Online Educational Channel https://www.swayamprabha.gov.in/ | 32 DTH channels devoted to telecasting of high-quality educational programmes on 24X7 using the GSAT-15 satellite. |
| 16. | CEC-UGC YOUTUBE CHANNEL https://www.youtube.com/user/cecedusat) | more than 40,000 video programs, 24,000 e-content modules and CEC has developed around 322 Undergraduate MOOCs covering Arts, Literature, Language, Social Sciences, Natural and Applied Sciences and Management and Professional courses |
| 17. | National Digital Library of | Ministry of Human Resource Development |

| | | |
|---|---|---|
| | India (NDL) https://ndl.iitkgp.ac.in/ | (MHRD) under its National Mission on Education through Information and Communication Technology (NMEICT) has initiated the National Digital Library of India (NDL India) pilot project to develop a framework of virtual repository of learning resources with a single-window search facility. It contains 47,944,566 items hosted in NDL India. |

**BASAVA/SHARANA SAHITYA LIBRARIES AND INFORMATION RESOURCES NETWORK TOWARDS OPEN ACCESS MOVEMENT**

Exhaustive Collection development, Resource building and Clearinghouse of Information on Sharana Sahitya, Shivasharnas, Vachana Sahitya, Sharanakshetras from different sources are major tasks of the Project. Efforts have to be made to collect rare material, manuscripts, archival material and historical records from institutions, organizations, Mathas, individuals, Samsthanas, Sharanakshetras, Museums, etc. Photography, Videography, recording of statements by elders, Experts and Scholars have to be made in addition to borrowing manuscripts for digitization. Some of the following a new programs/works may be initiated by procuring the State-of-the-Art ICT facilities and networking to make the Basava samiti website as one stop point for information access by the Scholars, Researchers and Academicians.

Digitizing a document in print or other physical media makes the document more useful as well as more accessible. It is possible for a user to conduct a full-text search on a document that is digitized and OCRed. It is possible to create hyperlinks to lead a reader to related items within the text itself as well as to external resources. Ultimately, Digitization does not mean replacing the traditional library collections and services; rather, it serves to enhance them.

In an effort to reach all the SharanaShaitya Literature to the public and make it accessible in the open access mode, Institutional Repository (IR) of Basava Samithi's publications, rare documents etc using DSpace/Greenstone open-source software. Digitize available Photos of all known and documented Vachanakaras and Shiva Sharanas with brief biographical details. This shall be linked to the Website of Library IR and thereby Establish 'Sharana Sahitya Information Resources Network' by linking all Basava Samithi Libraries and Information Centers in India and abroad.

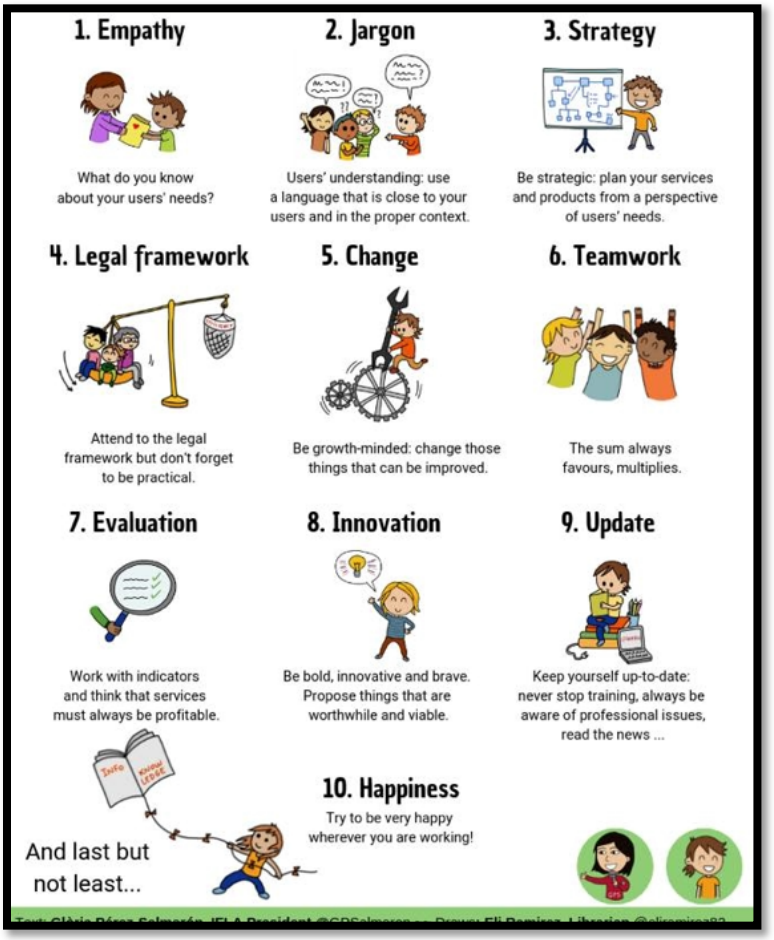
**EXPECTATIONS FOR LIBRARAINS IN THE POST COVID19**

According to contemporary thinkers, there exist five fundamental traits/dimensions of best librarian/information and knowledge manager.

1) Know the Library Users:
2) Need based content creation

**3)** Abreast with Knowledge Growth: Dr. A.N Bandi always keep himself in getting care of development and be growth-minded to change those things that can be improved, never stop reading and writing.
**4)** Teamwork Man:
**5)** Happiness with a smile and putting indicators for the resource center services must always reach to the end-user which always be profitable.

It should be noted that, irrespective of any situation for the survival and image building of Librarianship in this critical juncture, the Librarian should be a man of distinction with his/her skills of information management, leadership, IT passion and more important is his/her attitude towards service matters and this is depicted in the following picture for making effective ways to lead the Libraries on par excellence.



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# THEME 1
# Open Educational Resources

# Open Access Sources: Issues and Challenges

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## Abstract

*The issues and challenges of open access products and services were discussed in this paper. In addition it also discussed the benefits of open access, open source, and open standards are numerous on the Internet. Benefits include lower costs, great accessibility, and better prospects for long-term preservation of scholarly works. It is an attempt to study open access products on the Internet and their services.*

**Keywords:** *Open Access initiatives, Open Access, Sources and Services.*

## Introduction

Things changed after ICT improved; With the help of the Internet, electronic reports become accessible to all. Web means getting anything, anywhere, without any limits. Thus, around the word Internet brought the idea of getting the data kept in the organization. Plus, it's built for free, private access with the help of innovation. These days, in every state of the Earth, they put out their stuff for the general public to get to know them. Here comes the entrance to the material whether it is open material for public use or for limited use? In this paper an attempt has been made to focus on open access items and their administration on the web. Open access journals maintain the excellent peer survey with the traditional ups and downs of the diary, yet also change and design and promote furthermore.

Farzand Ali, Amna&Saleem, Qurat-Ul-Ain (2020) through their study on "Open Access Resources as an Opportunity for Academic Libraries during Pandemic: A Study" identified the advantages of open access resources for academic libraries which had a special reference to an emergency situation like the covid - 19 pandemic. The study mainly focused on the role played by the libraries and library professionals in providing quality services during this pandemic situation. The other main reason of the study was to highlight the efforts of HEC and high ranked university libraries during this covid-19 pandemic to fulfill the needs of their patrons. The results of the research study confirmed that academic libraries used open access resources to support the research activities of their parent

institute. The major purpose of using open access includes the fiscal constraints, time involved in getting the fee-based copies of journals and articles, budget cuts by parent institutes, and less involvement of authorities towards libraries.

The Guru of Open Access Harnad (2008) Features of Open Access are illustrated. "Data that is free, speedy, super durable, full-text, on-line and open". Harnad proposes three fundamental defenses of the OA: "to promote the take-up, use, applications, and impact of your higher institution test results; measure the take-up, use, applications, and impact of your institutional's research results." To collect, view and present a long-lasting record of your college's research results and impact".

Wilinsky (2003) identified nine flavors of open access. They are:

 E-print archive (authors self-archive pre – or post prints)

 Unqualified (immediate and full open access publication of a journal)

 Dual mode (both print subscription and open access versions of a journal are offered)

 Delayed open access (open access is available after a certain period of time)

 Author fee (authors pay a fee to support open access)

 Partial open access (some articles from a journal are available via open access)

 Per capita (open access is made available to countries based on per-capita income)

 Abstract (open access available to table of contents/abstracts) and

 Co-op (institutional members support open access journals)

**Open Access**

Open Access (OA) is the act of providing seamless access via the Internet for peer-checking on insightful diary articles. Proposals, academic monographs and book sections are also being given OA progressively.

Open access comes in two degrees: Free OA is a no-cost Internet-based admission, while Libre OA is free OA with the addition of some additional access privileges. Open matter is like OA, although it usually includes the option of accommodating the work, whereas academic distribution is routine in keeping the substance of an article in one piece and linking it to the appropriate author or fixed assembly of authors. The Imaginative Commons license can be

used to determine usage privileges. The idea of open access can also be extended to the learning items and assets provided in e-learning.

### Green OA Self Archiving

Authors distribute in any diary and later self-document a form of the article with the expectation of complimentary public use in their institutional repository,] a focal vault (such as PubMed Central), or on another OA site . What is kept is the partner's evaluation postprint - either the manufacturer's referee, the revised final draft or the distributor's version of the record. Green OA Diary Distributors adopt accelerated OA self-filing by their creators. OA self-documentation was first officially proposed in 1994 by Steven Harnaud. In any case, self-filing of nearby FTP files was being eliminated by PC researchers at the time in their nearby FTP files, which were later aggregated into CitySeer. High-energy physicists have been self-filing halfway into the arXiv, starting around 1991.

### Gold OA Publishing

Writers distribute in an open access diary that gives a quick OA of each of their articles on the distributor's website. [8] (Hybrid open access diaries award Gold OA only to unique articles for which their authors (or their authors founded or funders) pay an OA distribution fee. Examples of OA distributors [13] BioMed Central, Public Library of Science, and Are. Dove Medical Press.

Free-to-the-world wide web became far-reaching in the late 1990s and mid-2000s. Minimal expense dissemination innovation has driven OA development, and inspired both the Green OA self-chronicling of non-OA diary articles and the creation of the Gold OA diary. The customary non-OA diary covers delivery costs through access costs, for example, membership, site-licensing or pay-per-view. Some non-OA diaries give OA after a restriction time of 6 years or more (see Delayed Open Access Diaries). Dynamic discussion on financial matters and interdependence of different approaches to deliver OA among experts, scholars, curators, college officials, subsidizing organizations, government officials, trade distributors, publishing staff and society distributors.

## Hybrid OA

Cross-breed open-access diaries contain a combination of open access articles and closed access articles. A distributor following this model is somewhat subsidized by subscription, and gives open access only to singular articles for which the author (or exploration support) pays distribution expenses. For the most part the crossover OA costs more than the gold OA and can offer a

lower nature of administration. One particularly questionable practice is "going for seconds" in the Half Breed open access diary, where two creators and supporters are accused.

## Features of Open Access

- All materials are accessible web or on the web.
- Continuously free accessibility of insightful distribution.
- Anyone from anyplace the material can be gotten to by with no preference
- Free copyright and permitting limitations
- Full text materials are accessible nonstop
- Material can be uninhibitedly utilized by anybody.
- Multi-media, academic articles and their preprints are give through open Access.

However, it should be noted that OA supplies are not free of cost or at a lower cost than traditional education papers. Distribution costs are transferred to various sources, just like colleges and schools. This way, open access is free at all times for the audience, not the producers, and it is not exempt from the offer. The creator or manufacturer awards recognition owner the option to be properly and fully recognized for widespread use and reuse of data and no authorization is given to modify distribution or report it for commercial purposes. The continuous expansion of the Internet and new computerized distribution advancements provide us with a one-of-a-kind opportunity to work in educational exchange. The use of this new environment is open access to make all the wise exam papers unrestricted and accessible to all the interested users. Useful open access items and downstream events of the administration will be presented along with illustrations of late developments at the political level linking open access.

## E-Journals

E-journals allow new types of diaries to be memorized, for example video content or exam-based information codes. With the growth and development of the Internet, there has been an increase in the number of new diaries, especially those that are computerized distribution. This set of diaries is an open access topic, accessible to all, and has a Creative Commons license to reproduce the content in a variety of ways. The best open access diaries are recorded in the

Directory of Open Access Journals. Most will be membership diaries anyway, purchases of libraries, associations and public access.

## Free open-access journals

Free open access diaries use a variety of action plans. Some OA diaries have immediate or backhanded endowments from establishments such as colleges, laboratories, research centers, libraries, emergency clinics, historical centers, learned social order, establishments, or government offices. Some have income from a separate line of non-OA distribution. Some receive income from promotions, ancillary administration, participation fees, promotions, reprints, or a print or premium edition. Some people rely more on volunteering than on individual diaries. Some undoubtedly use a mixture of these methods.

## Issues and Challenges in Open Access Movement

The issues with open access distribution are almost as varied as those related to diaries.As of late the broader communication view on the academic delivery process has elicited both internal and external evaluation of the major perspectives at all times, they are

- The extent and quality of peer review.
- The technologies and cost associated with the capture and display of information and the various distribution channels.
- The pricing policies and subsequent business exercised by the various types of scholarly publishers.
- The always expanding assumptions for the foremost customer concerning the technique for data conveyance alongside its expense, accessibility, and reach out of access.
- The effect of new innovations and current distributing financial matters on other area of the correspondence cycle, to be specific, creators, libraries and unified enterprises such aggregators and membership specialists.
- The mechanical difficulties to following the precision and availability of documents both present and future alongside the expected effect of creator files and store chronicles
- The general maintainability of the insightful correspondence process.

## Barriers to Open Access

Significant expense of ICTs foundations and availability and unfortunate telecom foundation:

- Satisfactory Funding to make and advance the web foundation in creating nations
- Deficient consolation, absence of mindfulness and confusions of the presence and advantages:
- Overseeing IPR (Copy directly) through various distributing arrangements.

**Indian Initiatives: Open Access Journals**

OA development has made the Indian Journals arrive at the ideal interest group of the world's networks and presently in excess of hundred Indian Journals gives give free admittance to full message substance. India is set in the sixth situation in the rundown of open access diaries which is well in front of nations, for example, the Netherlands, China, Germany, Australia and so on Regardless of the number or nature of OA diaries and archives in India, it has shown an extraordinary responsibility among the creating scene

Various Indian distributers are exploiting the superior correspondence organizations and innovation to start an open access strategy for their diaries. These drives are going on as disengaged endeavors by both society and private publishers.

1. Bio Line International: (http://www.bioline.org.br/);
2. Indian Academy of Sciences Published Open Access Journals. e-journals@INSA
3. Indian MEDLARS Centre: (http://indmed.nic.in/);
4. Indian National Science Academy. (http://www.insaindia.org/)
5. IndianJounals.com hosted Open Access Journals ( www.indianjournals.com)
6. ISI Kolkata :Sankhya (http://sankhya.isical.ac.in/)
7. Kamalraj enterprise publishes Open Access Journals.
8. (www.krepublishers.com/KRE-New-J/index.html)
9. MEDIND@NIC : Biomedical Journals from India (http://medind.nic.in )
10. Medknow Publications hosted Open Access Journals

(www.mdknow.com/journals.asp )

11. NISCAIR (National Institute of Science Communication and Information Resources) Journals (http://www.niscom.res.in/ScienceCommunication)

**Conclusion:**

The Open Source development has enormously impacted the data correspondence innovation, in especially computerized library climate where the data frameworks and administrations are inescapable. The advantages of open access, open source, and open guidelines are various over the web. The advantages incorporate lower costs, incredible availability, and better possibilities for long haul protection of academic works.

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# Open Educational Resources in Cyber Security

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## Abstract

*The cyber space continues to evolve at a fast pace. Advances in technologies continue enabling the users of internet throughout the globe to access information based their demand at a very low cost. Individuals learn and develop skills for use in day to day life by taking advantage of this proliferation of sharing information through the internet. Cyber security is a new and rapidly evolving field. It produces unique challenges for individuals who wish to develop new and refine existing knowledge to maintain relevance. Academicians face additional challenges of keeping pace with industry needs and trends, especially in preparing the researchers with both technical and critical thinking skills in order to excel in the field. There is an increase in demand for cyber security professionals in the workforce increases, new pathways have to be developed for the researcher's community to acquire the relevant skills to secure our digital resources. In the recent many new emerging attack threats emerged that require constant development and refinement of skills by professionals to identify and respond to these cyber developments. It takes very deep skillsets from individuals to make an impact on cyber readiness overall. Cyber professionals become life-long learners of their trade; constantly following developments in the field to address new, changing, and more sophisticated attacks. Open Educational resources (OER) in traditional learning environments can offer new opportunities for enriching learning experience for knowledge seekers. This paper focuses on the need for adopting Open Educational Resources in the field of cyber security.*

**Keywords:** *Cyber Security- Open Educational Research-Cyber Attaks-Open Educational Resources*

## Introduction

Information is a commodity, it's like the air we breathe, food we eat and clothes to we wear etc and its marketable like product. People are ready to pay any amount provided it helps in increasing their productivity where they use it. We are living in

the information age and knowledge society. Users access the information for fulfilling their needs be it personal, business, professional, political, economic, social, educational, scientific, etc. There are different types of sources of information, collected, stored and preserved, processed and disseminated to different type of users for their purpose.

The cyber space continues to evolve at a fast pace. Advances in technologies continue enabling the users of internet throughout the globe to access information based their demand at a very low cost. Individuals learn and develop skills for use in day to day life by taking advantage of this proliferation of sharing information through the internet. Cyber security is a new and rapidly evolving field. It produces unique challenges for individuals who wish to develop new and refine existing knowledge to maintain relevance. Academicians face additional challenges of keeping pace with industry needs and trends, especially in preparing the researchers with both technical and critical thinking skills in order to excel in the field. There is an increase in demand for cyber security professionals in the workforce increases, new pathways have to be developed for the researcher's community to acquire the relevant skills to secure our digital resources. In the recent many new emerging attack threats emerged that require constant development and refinement of skills by professionals to identify and respond to these cyber developments. It takes very deep skillsets from individuals to make an impact on cyber readiness overall. Cyber professionals become life-long learners of their trade; constantly following developments in the field to address new, changing, and more sophisticated attacks.

## Open Educational resources (OER)

OECD (2009) has described "a learning resource can refer either to any resources used by teachers and students for the purpose of learning, or to resources particularly designed to be used in learning settings".In the past few decades, education sector has witnessed a major paradigm shift both in terms of teaching methods and in terms of educational resources. Print resources have been largely replaced by Digital Learning Resources. This digital transformation has made educational content available and affordable for the communities at large.After Open Access and Open-Source Software movements success Open Educational Resources is an extended version of these globally accepted higher education movements towards openness.. Open Educational resources (OER) in traditional learning environments can offer new opportunities for enriching learning experience for knowledge seekers. Open Educational Resources refers to any teaching and learning materials that reside in the public domain or have been

released under an Open license, such as creative common license, General Public License (GPL) that permits no-cost access, use, adaptation and redistribution with no or limited restrictions. (Source: OER toolkit, Colleges Library Ontario). Open Educational Resources or OER refer to any teaching and learning materials that reside in the public domain or have been released under an Open license, such as creative common license or GNU General Public License that permits no-cost access, use, adaptation and redistribution with no or limited restrictions. (Source: OER toolkit, Colleges Library Ontario). OER can be full courses, learning objects test or any other tools, materials or techniques for use in teaching, learning and research. The content for OER could be in the for of course material, open textbooks, videos, lesson plans, software, games.

Open Educational Resource fulfils the true aim of education, reaching out to those who cannot afford or access them. Main OER initiatives from India and abroad as follows.

1. National Programme on Technology Enhanced Learning (NPTEL)
2. Study Webs of Active Learning for Young Aspiring Minds (SWAYAM)
3. E-PG Pathshala
4. Consortium of Educational Communication (CEC)
5. Spoken Tutorial
6. Virtual Labs
7. Free and Open Source Software in Education (FOSSEE)
8. Shodhganga
9. VIDWAN
10. A-VIEW
11. E-Yantra
12. Quantum and Nano Computing Virtual Centre
13. ERP Mission
14. ISLERS
15. Oscar++
16. E-Kalpa
17. Pedagogy Project
18. Echarya
19. National Digital Library of India
20. AICTE Courses
21. SWAYAM PRABHA
22. eGyanKosh
23. e-ShodhSindhu
24. IRINS

## UNESCO Recommendations on OER

The Recommendation on OER - adopted unanimously by the UNESCO General Conference at its 40th session in November 2019 - supports the creation, use and adaptation of inclusive and quality OER, and facilitates international cooperation in this field.
The Recommendation is the only existing international standard-setting instrument on OER and is the fruit of over a decade of efforts to bring together a wide diversity of stakeholders.

The Recommendation outlines five Areas of Action, namely:

1. Building the capacity of stakeholders to create, access, re-use, adapt and redistribute OER;
2. Developing supportive policy for OER;
3. Encouraging inclusive and equitable quality OER;
4. Nurturing the creation of sustainability models for OER; and
5. Promoting and reinforcing international cooperation in OER.

The UNESCO OER Recommendation, which supports the creation, use and adaptation of inclusive and quality OER, and facilitates international cooperation in this field, is the fruit of over a decade of multi-stakeholder efforts in the area of OER highlighted by an inter-governmental meeting in May 2019 . This Inter-governmental meeting organised by UNESCO brought together some 100 Experts nominated by UNESCO Member States as well as Observers from civil society and partner Intergovernmental Organizations. (Source:https://en.unesco.org/themes/building-knowledge-societies/oer/recommendation).

The term open educational resources first came into use at a conference hosted by UNESCO in 2002, defined as "the open provision of educational resources, enabled by information and communication technologies, for consultation, use and adaptation by a community of users for non-commercial purposes" (Johnstone, 2005). The definition of OER now most often used is: "open educational resources are digitised materials offered freely and openly for educators, students and self-learners to use and reuse for teaching, learning and research". To clarify further, OER is said to include: Learning content: Full courses, courseware, content modules, learning objects, collections and journals.

**Tools:** Software to support the development, use, reuse and delivery of learning content, including searching and organisation of content, content and learning management systems, content development tools, and online learning communities.

**Implementation resources**: Intellectual property licences to promote open publishing of materials, design principles of best practice and localise content.

**Forms of OER**

OER can be found in the following forms.

1. Lecture notes
2. Database
3. E-books
4. Encyclopaedias
5. E-Journals
6. Course Materials
7. Full Course
8. Media
9. Modules
10. PDF Records
11. Infographics
12. Documents
13. Open Stacks
14. Case Examines
15. Podcasts
16. Narrated Visuals
17. Articles
18. Education related recordings
19. Audio books
20. Magazines
21. Instructive sources or resources
22. Software
23. Games
24. Lesson Plans
25. Discussion Paper
26. Working Paper
27. Occasional Paper
28. Monographs
29. Theme Papers
30. Symposium Papers
31. Reports
32. CaseStudies

**David Wiley** describes the following 5R Activities to allow the users to engage in the open resources:

- **Retain:** The right to make, own, and control copies of the content (e.g., download, duplicate, store, and manage)
- **Reuse**: The right to use the content in a wide range of ways (e.g., in a class, in a study group, on a website, in a video)
- **Revise:** The right to adapt, adjust, modify, or alter the content itself (e.g., translate the content into another language)
- **Remix:** The right to combine the original or revised content with other material to create something new (e.g., incorporate the content into a mashup)
- **Redistribute:** The right to share copies of the original content, your revisions, or your remixes with others (e.g., give a copy of the content to a friend) (S**ource:** Wiley, D. (n.d.) *Defining the "Open" in Open Content and Open Educational Resources*. OpenContent.org. opencontent.org/definition/)

## OER in Cyber Security

Cyber security began in 1972 with a research project on ARPANET (The Advanced Research Projects Agency Network). Cyber criminals find the new software vulnerabilities and they attack every day on the cyber space. Cybersecurity experts are faced with a real challenge to combat the cyber criminals and their attacks as such. Intelligence sharing can help to strengthen our collective resilience and proactive approach of mitigation to potential cyber threats. Cybercriminals are changing the rules of their game by sharing their information freely such that the new malefic techniques spread among the cross sections of criminal syndicates. The idea of information sharing has thus become very important as it helps in the process of mitigating cyber threats through cyber threat intelligence (CTI). Thus proactive sharing of informationabout attacks and defensive mitigations builds resilience across organizations participating within a given trust community, evolving herd immunity against attacks that others have seen only within their own networks. However there are concerns about sharing of information as it requires trust.OER in cyber security has evolved through the past five decades. The growth is exponential. OER in cyber security helps the users to retain, reuse, revise, remix and redistribute the various aspects of cyber security as such.

**Forms of OER in Cyber Security**

The list of only some of the forms of OER in Cyber Security with one link against each form is given below:

1. Lecture notes -https://ocw.mit.edu/courses/electrical-engineering-and-computer-science/6-857-network-and-computer-security-spring-2014/lecture-notes-and-readings/
2. Database -https://www.sei.cmu.edu/about/divisions/cert/
3. E-books -https://www.edureka.co/blog/ebook/cybersecurity-ebook
4. E-Journals - https://www.mdpi.com/about/journals
5. Course Materials - https://www.coursary.com/;
6. Full Course - https://www.cybrary.it/ ;
7. Modules -https://nptel.ac.in/
8. Infographics - https://www.oilandgasiq.com/strategy-management-and-information/whitepapers/infographic-cyber-security-are-you-really-doing
9. Documents - https://creativecommons.org/2002/10/23/itsecurity/
10. Open Stacks - https://docs.openstack.org/security-guide/
11. Case Examines - https://www.cybersecuritycasestudies.com/
12. Podcasts - https://www.youtube.com/watch?v=-OBWRxyRuY8
13. Learning content -https://www.nist.gov/itl/applied-cybersecurity/nice/resources/online-learning-content
14. Articles - https://academic.oup.com/cybersecurity
15. Magazines - https://library.mit.edu.au/c.php?g=948367&p=6873091
16. Software - https://github.com/topics/cybersecurity
17. Games - https://owasp.org/www-project-cornucopia/
18. Lesson Plans - https://teachingsecurity.org/lesson-1-the-security-mindset/
19. Reports - https://pages.checkpoint.com/cyber-security-report-2022.html
20. Case Studies – Blogs - https://blog.ipleaders.in/

Apart from the links against each form given above the following links are also useful in retrieving information regarding the various facet of cyber security:

Open Access Journals:

https://www.scirp.org/

https://benthamscience.com/

https://benthamopen.com/

https://doaj.org/

http://www.sciencepublishinggroup.com/

https://www.hindawi.com/

http://www.sciencedomain.org/

https://www.springeropen.com/journals

http://www.elsevier.com

http://highwire.stanford.edu/

http://www.ias.ac.in/

http://www.niscair.res.in/

http://www.academicjournals.org

http://omicsonline.org

Massive open online course:

https://swayam.gov.in/

https://www.coursera.org

https://www.edx.org

https://www.futurelearn.com/

https://academicearth.org

https://www.nios.ac.in/

http://www.brightstorm.com

http://epgp.inflibnet.ac.in/

http://nptel.ac.in/

http://eacharya.inflibnet.ac.in/vidya-mitra/

https://epathshala.nic.in/

https://www.udemy.com/courses/

**Free online books:**

https://archive.org

https://libgen.is

Academic and Skill-Based Learning:

https://cosmolearning.org

**Challenges before the Academics**

The creation of open education materials in various disciplines by the experts from the institutions of repute will help the teachers to access these materials at the click of the mouse which will help them in classroom teaching. Moreover, it is more beneficial for the students as they will get the opportunity to hear the lectures from the teachers of international repute. Open educationalm resources which are generally made web based are interactive in nature therefore it helps the learner to interact with the teachers and thus clarify the doubts instantaneously. The biggest challenge for the academic fraternity is to create open electronic material for diverse demographical population in diverse vernacular languages as majority of our students belong to different vernacular medium. Another challenge is to make different stakeholders aware of the different open educational resources available to them free of cost. It is indeed necessary that we teachers collaborate, adapt and adopt, translate the educational resources with the external world as it is very difficult to create all kind of materials. In all, one can say success of OER movement means success for higher education.

**Conclusion**

Teaching and learning community worldwide are developing plenty of educational resources on internet to be used freely and openly by everyone. These collaborative efforts have given birth to a new world where every human can access, create or contribute in the wealth of human knowledge. Open educational resources movement is nurturing a knowledge society where a culture of learning, cooperating, creating and sharing is developed among educators. The exponential growth of information resources has created a form of access which is paramount to the demands of today's information users. Therefore, the necessary form in which this access is made easy is through e-resources. The electronic resources are

completely immersed in our environment. The world becomes the world of technology and students are well aware about the use of electronic information resources. They prefer World Wide Web resources for different educational and research purpose. The current evolution in information technology brings major change in the way of information communication. Open Access has been introduced in India for the last two decades. India's contribution to open access literature shows a growing trend however there is a need for publication of more and more numbers of qualitative open access journals to give a platform for future researchers. Open-access of scholarly literature can be achieved in high scale where policy frameworks, institutional frameworks, information infrastructure, trained manpower, and financial resources are adequately available. India as a developing country should mandate policies and regulations for open access to publications. There is a strong requirement for the existence of cooperation among governments, industries, and educational institutions to work together in building an adept taskforce which can adapt themselves to the changing needsin the field of cyber security. As the field of cyber security evolves itself new challenges in the areas of creation of critical infrastructures, creation of resilient systemsemerges. Mere technical training is not sufficient to cater to the needs and requirements of the cyber workforce.They should be meticulously trained in the areas of analysis, problem solving, and communications skills coupled with technical skills so as to help them to adapt themselves to the ever changing cyber environments. OERs help in achieving and shaping the learning environments by introducing new possibilities for the learners of cyber security.

Some sceptical people though attribute limitations and misconceptions about OER, in playing a delimiting role in adoption and creation. However OER provides the opportunity for the learners to handle new emerging topics with ease. Thus OERs encourages its users like cyber professionals, industry leaders, students, researchers and academiciansto create, contribute, and adopt to open learning materials that could shape them to be more mature in building a safe digital society as such.

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# MOOCs: An Effective Alternative to Formal Education

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## ABSTRACT

*The paper highlights how MOOCs developed gradually. The history of MOOCs has been touched upon. The benefits of MOOCs have been discussed. The benefits include wider accessibility to higher education, affordable alternative to formal education, flexible learning schedule and online collaboration. Besides the benefits, the challenges and the criticisms that are faced by MOOCs have also been dealt with. The various MOOCs that have developed in India have been discussed. The MOOCs like SWAYAM, NPTEL, mooKIT, IITBX have been dealt with in detail. The MOOCs platforms at the international level like, Coursera, EdX, FutureLearn, Canvas Network, Miriadax and France UniversiteNumerique have been discussed. The fact concluded is that MOOCs can help the society immensely in its advancement by providing greater accessibility to knowledge, especially, in a country like India where huge demand of enrollment for higher education cannot be fulfilled by the system of formal education.*

**KEYWORDS:** *MOOCs, SWAYAM, NPTEL, mooKIT, IITBX, Coursera, EdX, FutureLearn, Canvas Network, Miriadax, France UniversiteNumerique, ThaiMooc*

## Introduction

In today's information-based society, every person wants to have access to more and more information and knowledge. The formal education system of not a single country can satisfy the demand of all the education seekers of the country. Sir John Daniel, President and CEO of The Commonwealth of Learning (2004-12) mentions, "Today there are over thirty million people who are fully qualified to enter a university, but there is no place available. To meet the staggering global demand for advanced education, a major university needs to be created every week". So, to meet this great demand for education and knowledge, the Massive Open Online Courses (MOOCs) have a significant role to play. Again, the present COVID 19 pandemic situation, has increased the significance of MOOCs manifold. The entire education system of the world has adopted the online mode of teaching-learning process to cope up with the problems that have emerged in imparting the

education in physical mode due to the pandemic. This has resulted in the creation of more and more awareness about the availability of online platforms of education like MOOCs.

## History of MOOCs

A Massive Open Online Course is an online course which is designed for the participation of a large number of learners and is open access via the Web. Besides, providing the formal study materials like video lectures, and assignments, they also provide platform for interaction among the students, teachers and the support-staff of teaching-learning process. They also provide feedback for quizzes and the assignments.

Before the emergence of Digital Age, the distance education was conducted in the form of correspondence courses, radio and television broadcast of courses, e.g., radio broadcast of IGNOU courses in our country and the early forms of e-learning. During the 2000s, there occurred changes in online e-learning and distance education.

The Open Educational Resources (OER) movement initiated by MITOpenCourseWare project, led to the development of the first MOOC. The above mentioned movement was developed as a result of the fact that the work of the researchers established that there was no connection between the class size and the learning outcomes, evident from the fact that Daniel Barwick's work was the most often cited example. In 2008,Dave Cormier from the University of Prince Edward Island ,coined the acronym,'MOOC' in relation to a course known as'Connectivism and Connective Knowledge' ( also known as CCK08).

The early MOOCs, such as, the connectivist MOOCs (cMOOCs) allowed open licensing for their course materials enabling reuse and remixing of the resources. While the Extended MOOCs (xMOOCs) of the present day, follow the closed licenses for their course materials allowing free access to the students.cMOOCs are based on the principles of connectivist pedagogy, that is, this type of MOOCs advocate that the course materials should be aggregated rather pre-selected, should be remixable, re-purposable and feeding forward, that is, the evolution of the course material should be aimed at future learning. This type of platforms aim to connect the learners to each other to answer questions or collaborate on joint ventures. On the other hand, xMOOCs have a traditional course structure. They are aimed at

completing a course with a specified syllabus and recorded lectures and self-test problems.

## Benefits of MOOCs

MOOCs have several benefits in the field of education. Some of them are as follows:

1) They provide wider accessibility to higher education. With the availability of technologies, the students can have access to various courses provided by the renowned institutions all over the world.
2) They provide an affordable alternative to formal education. The cost of formal education is getting hiked day by day. With the help of MOOCs, the learners can access any course at any time and anywhere without any entry qualification and for free. The only necessity is to have an internet connection.
3) They offer a flexible learning schedule. Some courses on MOOCs platform can be accessed at any time instead of scheduled class time. The learner can complete the course and appear for tests as per their convenient time.
4) They offer online collaboration. The learner can collaborate with each other without having to meet physically. Though the time zone may affect the time when the learners interact, the projects and the assignments can be completed by including the skills and the resources which the learners offer from various parts of the world.

## Disadvantages of MOOCs

According to the'MOOC Guide' , some of the disadvantages of MOOCs are:

1) Dependence on the contents created by the users may pose confusing situations.
2) One should be tech-savvy for using the online course contents.
3) The participants may have to devote more time and endeavour than one is willing to devote to a free online course.
4) The course may be modified a number of times by the students as a result of which the instructors may find it difficult to control the course.
5) Participants have to regulate themselves with their own defined goals.
6) Barriers of language and translation .
7) Hindrance of accessibility for the specially-abled persons.

8) Hindrance of accessibility for the people of poor socio-economic background with limited internet accessibility.

Besides the above mentioned disadvantages, MOOCs are criticized by the journalists and the academics.

Robert Zemsky (2014) argues: "They came; they conquered very little; and now they face substantially diminished prospects."

Moshe Y Vardi criticized the format of "short, unsophisticated video chunks, interleaved with online quizzes and accompanied by social networking."

The comment of a faculty of San Jose State University to Michael Sandel, professor of Harvard University and MOOC teacher is mentioned below:

"Should one-size-fits-all vendor-designed blended courses become the norm, we fear two classes of universities will be created: one, well-funded colleges and universities in which privileged students get their own real professor; the other, financially stressed private and public universities in which students watch a bunch of video-taped lectures."

Cary Nelson, former president of the American Association of University Professors stated, "It's fine to put lectures online, but this plan only degrades degree programs if it plans to substitute for them."

Sandra Schroeder, chair of the Higher Education Program and Policy Council for the American Federation of Teachers expressed concern that " These students are not likely to succeed without the structure of a strong and sequenced academic program."

## Various MOOCs Initiatives in India

To cope up with the huge enrollment in India and to provide access to the higher education to a majority of people in India, various MOOCs courses have been developed like SWAYAM, NPTEL,mooKIT,IITBX.

## Study Webs of Active-Learning for Young Aspiring Minds (SWAYAM)

SWAYAM is a programme developed by the Government of India to achieve the three cardinal principles of Education Policy, namely, access, equity and quality. The objective of this effort is to take the best quality of

teaching and educational resources to all the people and bridge the digital gap for the students who have not been able to cope up with the digital revolution and have been deprived of the opportunities of joining the knowledge economy.

The course hosted on SWAYAM are in four quadrants-1) video lecture, 2) specially prepared reading material that can be downloaded/printed, 3) self-assessment tests through tests and quizzes and 4) an online discussion forum for clearing the doubts.

To ensure that the courses provided are of best quality, nine National Coordinators have been appointed:

| SL. NO. | NATIONAL COORDINATOR | COURSES OFFERED FOR |
|---|---|---|
| 01 | All India Council of Technical Education(AICTE) | Self-paced and international courses |
| 02 | National Programme on Technology Enhanced Learning(NPTEL) | Engineering |
| 03 | University Grants Commission(UGC) | Non-technical post-grduation education |
| 04 | Consortium for Educational Communication(CEC) | Under-graduate education |
| 05 | National Council of Educational Research and Training (NCERT) | School education |
| 06 | National Institute of Open Schooling(NIOS) | School education |
| 07 | Indira Gandhi National Open University(IGNOU) | Out-of-school students |
| 08 | Indian Institute of Management, Bangalore (IIMB) | Management studies |
| 09 | National Institute of Technical Teachers Training and Research(NITTTR) | Teacher training programme |

The courses of SWAYAM are offered free of cost. If the learners want a SWAYAM certificate, then only, they will have to register with a fee for the

final examinations and have to be present physically at the designated centres. The eligibility for the certificate is announced on the course page and the learners get the certificate if the criteria match. The universities or colleges approving the credit transfer for these courses can use this certificate or the marks obtained in these examinations.

## National Programme on Technology Enhanced Learning (NPTEL)

NPTEL was developed by the seven Indian Institutes of Technology ( Bombay, Delhi, Kanpur, Kharagpur, Madras, Guwahati and Roorkee) along with the Indian Institute of Science, Bangalore in 2003. Five core disciplines like civil engineering, computer science and engineering, electrical engineering, electronics and communication engineering and mechanical engineering and 235 courses in video/web format were developed in this phase.

The main goal of NPTEL Phase II (2009-14) was dedicated to improve the engineering and the core science courses launched in NPTEL Phase I. Six hundred more web/video courses were developed in all the major branches of engineering, physical science at the undergraduate and the post-graduate levels and management courses at the post-graduate level. The indexing of all the video and the web courses and the keyword searching weremade effective.

Some remarkable features of NPTEL are as follows:

- Largest online repository in the world for the engineering, basic sciences and the selected humanities and the social sciences subjects.
- The Youtube channel of NPTEL is the most subscribed educational channel with1 billion views and 42+ lakhs subscribers.
- The hours of video content exceed 56000.
- The repository of most accessed peer-reviewed learning resources in the world, 52000+ hours of transcribed content and 51000+ hours of subtitled videos.

## mooKIT

mooKIT is a MOOC management system initiated at IIT Kanpur, especially, for the developing countries. It's a system that the instructors, learners and system administrators find comfortable to work with. Its architecture makes it customizable and cost-effective.

The course MOOC with mooKIT has the following features:

| Course Content | Course Audience | Course Outcomes |
|---|---|---|
| Architecture of a MOOC | Instructors who want to teach a MOOC | Features of a MOOC and MOOC management system |
| Introduction to MOOC management system | System administrators who want to create MOOC portals | Course analytics |
| Installing mooKIT, mooKIT as a service, mooKIT app | Anybody who wants to learn about MOOCs and what happens behind the scenes | How to run a MOOC |
| | | |

## IITBX

IITBombayX is an online platform initiated by IIT Bombay for imparting Massive Open Online Courses (MOOCs) to learners from various backgrounds. It offers four types of MOOCs:

1) EduMOOCs
2) SkillMOOCs
3) TeachMOOCs
4) LifeMOOCS

| EduMOOCs | SkillMOOCs | TeachMOOCs | LifeMOOCs |
|---|---|---|---|
| For learners who wish to enhance their academic knowledge in different fields of study. | Trains individuals in their on-the-job skills, with a primary focus on professional development. | Designed for teachers across the country to enhance their teaching skills by introducing them to various pedagogical methodologies. | Offer courses of short durations for working professionals and others desiring to pursue life-long education. |

**MOOCs at International Level**

Not only in India, there are various MOOCs providers spread all over the world. Some of the notable MOOCs providers at the international level are as follows:

**Coursera**

This platform is based in United States, It was launched by two Stanford professors, Andrew Ng and Daphne Koller, in January 2012. It is the largest MOOC provider in the world. It has over 76 million students, 150 university partners and more than 50 industry partners. It provides about 5500 online courses. Besides these, it has its own specialized courses known as Specialization. It has more than 550 Specializations. It provides master's degree courses in the fields of computer science, data science, business and public health.

**EdX**

It is a platform based in United States.It was initiated by Harvard University and MIT in 2012. It is the second largest MOOC provider in the world. It has over 35 million students and 139 university partners. It is a non-profit organization.It provides about 3100 courses. In 2020, it has started a new specialized programme known as MicroBachelors.

**FutureLearn**

It si a United Kingdom based platform. It was founded by the Open University and now it is jointly operated by the Open University and Australia based group known as SEEK.It has more than 15 million users and is the largest MOOC provider in UK. It has its university partners inUK

and the other parts of the Europe.It has university partners in countries like United States, Australia and South Korea outside Europe. In 2021, it has started a new type of microcredential known as ExpertTrack.

**Canvas Network**

It is based in United States. It is not so renowned but it offers some free online courses imparted by the universities from all over the world. It is now offering professional development courses for the educators. Ithas 600 listed courses.

**Miriadax**

It is based in Spain and is a regional MOOCs providing platform in Spanish and Portuguese. These courses are developed by ninety-one universities from Spain, Argentina, Peru, Chile, Brazil, Columbia and the other Spanish and Portuguese speaking countries.

**France UniversiteNumerique(FUN)**

It is the official MOOC provider of France. It was started by the Ministry of Higher Education of France in 2013.It has more than one million students and 550 courses. It has more than hundred partners belonging to the higher education institutions with three universities of Belgium, one of Switzerland and two of Tunisia.

**ThaiMooc**

It is based in Thailand and was launched in 2017. It is the MOOC provider of Thailand and has more than 200 courses. It is built on Open edX.

It is thus evident that the MOOCs platforms are operating all over the world. These courses are gaining popularity and importance day by day with the steep rise in the demand of higher education.

**Conclusion**

MOOCs can have immense impact on the society. The huge demand of enrolment , especially, in a country like India, can only be satisfied with the help of MOOCs since it is not possible to enroll all the students in formal education. Again, these courses can help in continuing life-long learning and professional development since different MOOCs are being designed all

over the world for various purposes.There are some technological barriers in accessing the MOOCs for the socio-economic under-privileged people but this hindrance is decreasing day by day since the internet access is gradually reaching even in the remote areas and various service providers are providing the service at a cheaper rate. So, it can be concluded that MOOCs play an inevitable role in the advancement of the society by providing access to knowledge to a greater part of the population.

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# Teachers' Perception of MOOCs, OERs and E-Content Development in Indian Higher Education Institutions

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## Abstract

*Access to higher education with equity is ensured to all eligible persons and in particular to the vulnerable sections of the society by providing courses, content, learning material through harnessing of digital technology by prominent institutions of the country. Teachers find these initiatives highly useful and beneficial to the students which help in enriching their learning experiences and reaching the objective of the target groups.*

**Keywords:** *HEIs, MOOCs, SWAYAM, OERs, e-content development*

## Introduction

Technology is taking rapid strides in all areas of living and education sector is no exception. Information and Communication Technology has brought a novel learning paradigm as it helps in providing flexible delivery of content, wide access to users at low costs and life-long learners who can stay connected in the digital space. MOOCs and OERs have enriched the educational landscape of the country by being most inclusive and leveraging the digital literacy of both teachers and learners.

India's higher education system is third largest in the world and many institutions of repute are listed in the global ranking list. Education has been a subject in the Concurrent List since the 42$^{nd}$ Amendment. Several institutions which are public funded as well as private-funded have been established and Regulatory bodies such as UGC, AICTE, MCI, NCTE, ICAR, RCI, PCI, and BCI are the apex bodies which oversee the day to day affairs of higher education institutions. To ensure quality in HEIs, assessment and accreditation bodies such as NAAC, NAB have been established (1).

Despite all these initiatives taken by the government, the Gross Enrollment Ratio remains a dismal low- 15 percent in the year 2011-12 and 21 percent in the year 2016-17, the government wishes to see it reaching to 30 percent by the year 2030. The strategy developed by the Ministry of Human Resource Development so that access to higher education with equity is ensured to all eligible persons and in particular to the vulnerable sections includes investment of infrastructure, use of technology, academic reforms in higher learning and restructuring institutions for improving efficiency, relevance and creativity in higher education.

## MOOCs in Education

MOOCs i.e. Massive Open Online Courses have been a phenomenon as it helped in diminishing the digital divide; the best teaching, learning experience is offered on a platter and this transformation has been very quick and effective as courses through MOOCs have penetrated beyond boundaries. All the stake holders – the government, apex bodies, education institutions, corporate and the general public have been receptive of this welcome change as MOOCs have proven to be a distinct online learning experience. India is the third biggest consumer of MOOCs as a number of students have joined the courses of leading MOOC providers like Coursera, Udacity, edX, etc.

## SWAYAM – The Indian MOOC Platform

SWAYAM (Study Webs of Active-Learning for Young Aspiring Minds) is a program which has been initiated by the Government of India, MHRD and it is designed to achieve the three cardinal principles of Education Policy i. e. access, equity and quality. The objective of this effort is to take the best teaching learning resources to all, including the most disadvantaged. SWAYAM seeks to bridge the digital divide for students who have hitherto remained untouched by the digital revolution and have not been able to join the mainstream of the knowledge economy (2). The courses are available free of cost to the learners, however those wishing to appear for a proctored exam and seek certificate, need to pay a nominal fee. Best quality content is produced and delivered by nine National Coordinators which are appointed by the ministry.

## OERs

UNESCO has defined Open Educational Resources as teaching, learning and research materials in any medium – digital or otherwise – that reside in the public domain or have been released under an open license that permits no-cost access, use, adaptation and redistribution by others with no or limited restrictions (3). The free and open source software (FOSS) movement and open access (OA) has made possible the concept of OERs. The fore runners of making their course content available to educators, students and individual learners at a global level were MIT, Internet Archive, Project Gutenberg, Creative Commons and Open Courseware Consortium. The resources include course material, books, audio lectures, video lessons, images, etc. which are encouraged to be reused and adapted for educational purpose. These resources which are shared openly online are free of copyright violations, care is taken that due credit is given to the individual or institutional author of these resources. This ultimately enhances the author's or the institution's repute.

## E-Content Development

The course content which is produced digitally and made available for the target audience is called e-content development. It includes a set pattern in which learning objectives and learning outcomes are clearly mentioned. The methodology follows an instructional design and the contents could be used across various platforms. UGC has prepared guidelines for e-content development which is aimed at creating high quality resources and associated web-based learning to supplement the traditional teaching and learning which has now become inevitable. The content developed once is available for use at all its mirror sites like UGC INFONET, CEC, SWAYAM, etc. for access to all the teachers and students of Indian universities throughout the country. UGC also encourages the teachers and IT experts to contribute for content development and multimedia production and provides financial assistance and technical support for the same.

Content Management System (CMS), Learning Management System (LMS), Cloud Computing, Mobile Learning, Ubiquitous Learning are all components of OERs and e-content development.

## Objectives of the Study

The research has been taken up to study the perception and attitude of teachers of Higher Education Institutions towards MOOCs. The following objectives have been formulated –

1. To know if the respondents were aware of or joined MOOCs before joining the Refresher Program
2. To know if the respondents find MOOCs useful in their teaching
3. To know if the respondents think that MOOCs are useful for students in their learning
4. To know if OERs are regularly used by teachers of HEIs
5. To know if OERs are beneficial to their students in the learning process
6. To know if teachers regularly use e-content in their teaching programs
7. To know if teachers are ready to produce e-content for their teaching
8. To know if MOOCs, OERs and e-content have the potential to have positive impact on our educational system

## 2.3 Methodology

A questionnaire was designed to elicit the responses of the sample of the study which comprised of 98 university and college lecturers who came from pan India to do a Refresher Course on MOOCs, OERs and e-content development in Maulana Azad National Urdu University, Hyderabad. The tool was administered personally by the researchers and 64 of the respondents gave back the filled in questionnaire. The responses were thus analyzed as follows.

## Data Analysis

The following are the details of the composition of the respondents which include their age group, gender, designation, place of working, organization and type of institution.

| Age Group | No. Of Participants | Percentage |
|---|---|---|
| 20-30 | Nil | 0 |
| 30-40 | 23 | 36 |
| 40-50 | 33 | 51.5 |
| 50-60 | 08 | 12.5 |
| **Total Respondents** | **64** | **100** |

**Table-1 Age Group**

The Table-1 denotes the age of the respondents. There are no respondents within the age group of 20-30. There are 36 percent of respondents in the age group of 30-40. There are 51.5 percent of respondents in the age group of 40-50. And 12.5 percent of respondents belong to the age group of 50-60.

| Gender | No. Of Participants | Percentage |
|---|---|---|
| Male | 38 | 60 |
| Female | 26 | 40 |
| **Total Respondents** | **64** | **100** |

**Table -2 Gender**

The Table-2 denotes the gender of the respondents. 60 percent of the respondents were males and 40 percent were females out of the total 68 respondents.

| Designation | No. Of Participants | Percentage |
|---|---|---|
| Asst Professor | 60 | 94 |
| Librarian | 04 | 06 |
| **Total Respondents** | **64** | **100** |

**Table-3 Designation**

The Table-3 denotes the designation of the participants. There were 94 percent of Assistant Professors and 06 percent were Librarians out of the total 64 respondents.

| State | No. Of Participants | Percentage |
|---|---|---|
| Andhra Pradesh | 06 | 09 |
| Karnataka | 17 | 26 |
| Kashmir | 04 | 06 |
| Maharashtra | 18 | 28 |

| | | |
|---|---|---|
| Tamil Nadu | 01 | 0.01 |
| Telangana | 17 | 26 |
| Uttarkhand | 01 | 0.01 |
| **Total Respondents** | **64** | **100** |

**Table-4 Place of working**

The Table-4 denotes the place of working of the participants of the Refresher Course who had come to attend it from pan-India. 09 percent of the participants were from Andhra Pradesh, 26 percent from Karnataka, 06 percent from Kashmir, 28 percent from Maharashtra, 0.01 percent from Tamil Nadu, 26 percent from Telangana and 0.01 percent from Uttarkhand.

| Type of Organization | No. of Participants | Percentage |
|---|---|---|
| Government | 42 | 65.6 |
| Aided | 21 | 33.8 |
| Private | 01 | 0.01 |
| **Total Respondents** | **64** | **100** |

**Table-5 Type of Organization**

The Table-5 denotes the Type of Organization of the participants. Out of the total respondents, 65.6 percent were from Government Institutions, 33.8 percent were from Aided Institutions and 0.01 percent from Private Institution.

| Type of Institution | No. of Participants | Percentage |
|---|---|---|
| Degree College | 43 | 67 |
| University | 21 | 33 |
| **Total Respondents** | **64** | **100** |

**Table-6 Type of Institution**

The Table-6 denotes the Type of Institution of the participants. 67 percent of the respondents were from Degree Colleges and 33 percent were from Universities.

| Educational Qualification | No. of Participants | Percentage |
|---|---|---|
| PG with NET/SLET | 06 | 09 |
| PG with M. Phil | 12 | 18 |

| | | |
|---|---|---|
| Ph. D | 42 | 65 |
| Not mentioned | 04 | 06 |
| **Total Respondents** | **64** | **100** |

**Table-7 Educational Qualification**

The Table-7 denotes the Educational Qualification of the participants. There were 09 percent of the participants with PG and NET/SLET Qualification, 18 percent were with PG and M.Phil qualification, 65 percent of the respondents were with Ph D degree and 06 percent did not mention their degrees.

**Findings**

| S. No. | Perception | Yes % | No % | Total Respondents % |
|---|---|---|---|---|
| 1 | I have been aware of MOOC and OERs before joining this Refresher Course | 80 | 20 | 64 |
| 2 | I think MOOCs are very useful media to enhance my learning and knowledge | 98.4 | 0.01 | 64 |
| 3 | I think MOOCs not only supplement but add on to the teaching skills of a teacher | 92 | 08 | 64 |
| 4 | I think MOOCs have a significant contribution in the teaching-learning process. | 97 | 03 | 64 |
| 5 | I feel that MOOCs are going to be quite useful in the higher education system in India both for teachers as well as students. | 93 | 07 | 64 |
| 6 | I am going to recommend/encourage my students to take up MOOCs of their area of interest | 98.4 | 0.01 | 64 |
| 7 | I would be glad to take up one MOOC in my area of study to be hosted from my institution | 84 | 16 | 64 |
| 8 | I think the present set up of MOOCs require improvement | 93 | 07 | 64 |
| 9 | I think MOOCs are here to stay for good | 91 | 09 | 64 |
| 10 | I have been making a regular use of OERs in my day to day teaching | 63.5 | 37.5 | 64 |

| | | | | |
|---|---|---|---|---|
| 11 | I believe that OERs are an answer to UN's programme of universal access to information and knowledge. | 78 | 22 | 64 |
| 12 | I believe OERs are an important source for professional development | 95 | 05 | 64 |
| 13 | I feel that all teachers should have a thorough knowledge of access and use of OERs at a global level | 94 | 06 | 64 |
| 14 | I advise my students to refer e-content very frequently | 92 | 08 | 64 |
| 15 | I feel that teachers of higher education should be well versed with the technicalities and procedures of e-content development | 94 | 06 | 64 |
| 16 | Given an opportunity I would like to design an e-content module for my subject | 85 | 15 | 64 |
| 17 | I do not rely on the effectiveness and efficiency of OERs and e-content | 45 | 55 | 64 |
| 18 | MOOCs, OERs and e-content are a perpetual source of digital information in my subject | 83 | 17 | 64 |
| 19 | I think MOOCs, OERs and e-content have the potential of having a positive impact on our educational system | 91 | 09 | 64 |

- Eighty percent of the respondents said that they were aware of MOOC and OERs before joining the Refresher Course and 20 percent said they were not aware of it before joining the course.
- Ninety eight percent of the respondents thought that MOOCs were very useful media to enhance their learning and knowledge and only 0.01 percent thought otherwise.
- Ninety two percent of the respondents opined that MOOCs not only supplement but add on to the teaching skills of a teacher where as eight percent thought otherwise.
- Ninety seven percent of the respondents thought MOOCs have a significant contribution in the teaching-learning process and three percent did not agree.
- Ninety three percent of the respondents thought that MOOCs were going to be quite useful in the higher education system in India both for teachers as

well as students while seven percent did not think so.

- Ninety eight percent of the respondents said that they were going to recommend/encourage their students to take up MOOCs of their area of interest and only 0.01 percent did not say so.
- Eighty four percent of the respondents said that they would be glad to take up one MOOC in their area of study if it is hosted from their institution and 16 percent were not interested.
- Ninety three percent of the respondents thought that the present set up of MOOCs require improvement and seven percent did not think so.
- Ninety one percent of the respondents opined that MOOCs are here to stay for good and nine percent did not think so.
- Sixty four percent of the respondents have been making regular use of OERs in their day to day teaching and thirty six percent did not use it.
- Seventy eight percent of the respondents believed that OERs are an answer to UN's programme of universal access to information and knowledge where as 22 percent did not believe in it.
- Ninety five percent of the respondents believed that OERs were an important source for professional development and five percent did not agree.
- Ninety four percent of the respondents felt that all teachers should have a thorough knowledge of access and use of OERs at a global level where as six percent did not think so.
- Ninety two percent of the respondents said that they would advise their students to refer e-content very frequently but eight percent did not think so.
- Ninety four percent of the respondents felt that teachers of higher education should be well versed with the technicalities and procedures of e-content development but six percent of the respondents did not feel so.
- Eighty five percent of the respondents said that given an opportunity they would like to design an e-content module for their subject where as fifteen percent differed on it.
- Forty five percent of the respondents said they did not rely on the effectiveness and efficiency of OERs and e-content but fifty five percent of the respondents relied on its effectiveness.
- Eighty three percent of the respondents agreed that MOOCs, OERs and e-content are a perpetual source of digital information in their subject where as seventeen percent disagreed.
- Ninety one percent of the respondents opined MOOCs, OERs and e-content have the potential of having a positive impact on our educational system where as nine percent disagreed.

There were twenty one participants who were pursuing or had completed a course in MOOCs before joining the Refresher Course in their subject of interest from SWAYAM, IIT Bombay, NPTEL and Coursera.

| Name of the Course | Platform | No. of Respondents |
|---|---|---|
| ARPIT in different disciplines | SWAYAM | 06 |
| Library Automation | SWAYAM | 01 |
| Research Methodology | SWAYAM | 01 |
| Gender Studies | SWAYAM | 01 |
| Data Analysis | SWAYAM | 01 |
| Academic Writing | SWAYAM | 01 |
| Critical Thinking | SWAYAM | 01 |
| Pedagogy | IIT Bombay | 01 |
| Java | IIT Bombay | 01 |
| Coordination Chemistry | NPTEL | 01 |
| Mathematics | NPTEL | 01 |
| Future Learn | Coursera | 02 |
| Big Data | Coursera | 02 |
| Classical Mechanics | Coursera | 01 |

**No. of Respondents who are doing or completed MOOCs course – 21**

## Conclusion

The participants of the Refresher Course who were all faculty of Higher Education Institutions were positive to accept change in the educational pattern of study. They were receptive to pursuing courses through MOOCs platform as well as prepare e-content development in their teaching – learning process. They also used and encouraged their students to make use of Open Educational Resources in accordance with universal access to information. It was concluded from the study that the respondents were aware of or joined MOOCs before joining the Refresher Program. They also found that MOOCs was useful in their teaching – learning process. OERs were also regularly used by teachers as well as students of HEIs. The teachers were also regularly using e-content in their teaching and were also game to produce e-content for their teaching programs. Almost all of the

participants agreed that MOOCs, OERs and e-content have the potential to have positive impact on our educational system.

## Suggestions

Commendable work is being done by the Department of Higher Education, Ministry of Human Resources Development in providing MOOCs courses at all India level for all types of students and from high school to PG level in almost all subjects and skill based courses so that maximum number of students takes advantage from these learning materials. Seven IITs and IISc and a few prominent universities are taking active part in providing the courses and its content. Deemed to be universities, autonomous and other colleges also should play an active role and provide e-content development facility, media centre and recording facility to their staff members who are interested in producing MOOCs courses. Technical support should also be extended to the interested staff members. And wide publicity should be given to the students to benefit from these courses.

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# Open Educational Resources:Role Of Swayam Mooc Courses

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**Abstract**
*Open educational materials are becoming increasingly important as a result of advances in information and communication technology (ICT) and the COVID-19 pandemic.The Ministry of Education, Government of India, has taken a keen interest in the higher education sector. We have to equip ourselves in this rapidly growing educational era. The union government and the UGC have issued guidelines to all higher educational institutions on how to incorporate swayammooc courses into their curriculum. This paper highlights the SWAYAM platform, its features, course national coordinators, and benefits for different categories of learners, as well as the advantages and importance of MOOC courses.*

## Introduction:

The union government and the Ministry of Educationhave been highly concentrating on higher education sectorto develop the higher education through online mode at free of cost to the entire society. To achieve this aim, the ministry is offering a number of certificate and diploma courses through the Study Webs of Active Learning for Young Aspiring Minds (SWAYAM) Portal and the National Programme on Technology Enhanced Learning (NPTEL) for Engineering Students.ICT can be leveraged to complement the formal education system as well as the distance education system at all levels. The use of OERs holds great promise of improving the access and the overall quality of education for the developed as well as the developing countries. The educational professionals are creating and using digital content for teaching and learning. The Indian Government is playing a proactive role by providing impetus to the growth of OER movement in the country through various national policy initiatives. A large number of national policy making bodies such as National knowledge Commission, University Grants Commission and other advisory bodies are providing the support to the movement in the country for improving access to quality education.

**Study Webs of Active Learning for Young Aspiring Minds (SWAYAM):**

Ministry of HRD, Government of India has taken initiative to establish the SWAYAM MOOC online courses. This platform that facilitates hosting of all the courses, taught in classrooms from Class 9th Standard to Post-graduation that can be accessed by anyone, anywhere at any time. All the courses are interactive, prepared by the best teachers in the country and are available, free of cost to any learner. More than 1,000 specially chosen faculty members across the country have participated in preparing these courses.

SWAYAM courses are hosted in 4 quadrants – video lecture, specially prepared reading material that can be downloaded/printed , self-assessment tests through tests and quizzes and Fourth one is online discussion forum for clearing the doubts. In order to ensure that best quality content is produced and delivered, nine National Coordinators have been appointed. They are:

1. AICTE (All India Council for Technical Education) for self-paced and international
   courses
2. NPTEL (National Programme on Technology Enhanced Learning) for Engineering
3. UGC (University Grants Commission) for non technical post-graduation education
4. CEC (Consortium for Educational Communication) for under-graduate education
5. NCERT (National Council of Educational Research and Training) for school education
6. NIOS (National Institute of Open Schooling) for school education
7. IGNOU (Indira Gandhi National Open University) for out-of-school students
8. IIMB (Indian Institute of Management, Bangalore) for management studies
9. NITTTR (National Institute of Technical Teachers Training and Research) for Teacher Training programme

Courses delivered through SWAYAM are available free of cost to the learners, however learners wanting a SWAYAM certificate should register for the final proctored exams that come at a fee and attend in-person at designated centres on specified dates. Eligibility for the certificate will be announced on the course page and learners will get certificates only if this criteria is matched.

**Advantages of MOOC:**

- ❖ All coursesare available at free of Cost

- Anyone, anywhere andanytime can learn
- From 9th Standard to Post graduation level
- Union Government, Universities reputed and recognized courses
- Universities/colleges approving credit transfer for these courses can use the marks/certificate obtained in these courses for the same.
- Online Refresher Courses for Faculty Career development
- Mobile learning
- Regular students also enrol in this platform
- Ministry of Education and Universities recognised certificates
- Each Course Provides Credit Points
- Recorded lecturescan be used at any time.
- Multiple courses may be pursued during the same period

**SWAYAM from9th to Post Graduation:**

SwayamMooc Platform provides courses from 9th Standard to Post graduation level students. The courses available in this platforms are NCERT Syllabus, CBSE Pattern, National Institute of Open Schooling, UGC-CEC, other reputed Universities and AICTE syllabus. These courses provide credit points for each course and it will be considered for UG and PG courses. The University Grants Commission has given the guidelines to all the higher educational institutions regarding this Credit Points to be adopted in respective courses.

**Research Scholars:**

As per the University Grants Commission (UGC) guidelines each research scholar has to completeat least two Mooc courses relevant to their major subject before submission of their Thesis/Dissertation. Language and Literature students may pursue common subjects or multidisciplinary subjects like Research Report writing, Research methodology, Environmental science etc., and they must submit two Mooc course certificates before their research report submission.

**Faculty of Higher Education Institutions:**

This SwayamMooc platform provides three types of benefits for their career development.

1. Teaching Learning Technology: Teaching learning skills, body language, teachers presentation techniques, delivery mode, methodology, and equipments required for this courses.
2. Career Advancement Programme: Faculty working in GovernmentInstitutions and Universities qualify two or more MOOC courses relevant to their field. It will be taken into account for their Career Advancement Scheme (CAS).

3. Faculty may also submit their recorded video contents/lessons to this platform through the National Coordinators. It is also an added advantage for their career development.

**SWAYAM for Life Long Learner :**

This SWAYAM Mooc courses will be utilized by the common public, subject specialist, Life Long learner, Academicians, Stake Holders etc., inorder to develop their personal skills, knowledge and wisdom.

**NODAL OFFICER & SPOC FOR SWAYAM MOOC:**

Institutions may appoint Nodal Officer for SwayamMooc courses and the following duties may be assigned to the person;

- ✓ Conducting awareness programme.
- ✓ Updating information received from NPTEL-SWAYAM.
- ✓ Circulating information regarding the courses,examination dates etc.,
- ✓ Annual Performance Report of the institution.

**Duties of Single Point of Contact (SPOC) :**

- ➢ He/ She will be the brand ambassador of NPTEL SWAYAM in the college.
- ➢ He/She will be kept informed of all the initiatives of NPTEL which he/she should publicise amongst the students and faculty of the college.
- ➢ Brochures/Posters of NPTEL content will be sent to him/her, who should ensure that they are displayed at the places frequented by faculty/students of the college to get maximum visibility.
- ➢ If emails about the activities/updates are sent to the SPOC, he/should forward them to the concerned person.

**Impact of SWAYAM MOOC:**

SWAYAM-MOOC platform created revolution in the Open Education system in across the globe. The development and the advancement of Information and Communication Technology (ICT) have brought drastic changes in primary to higher level of the education system globally. The mode of education system is categorized into two groups, one is the regular education system and other is the distance education system. Both the recent developments and prolongation of ICT and web2.0 tools prospered the concern for e-learning circumstances. The arrival of MOOCs has revitalized formal and distance learning. The concept of MOOCs eventually originated from the Open Educational Resources (OER) movement.

**Suggestion and Conclusion:**

Information and Communication Technology will rule overthe entireuniverse in this twenty-first century. We have to adopt the technology in our

daily routine according to the changing environment to reach our full potential. SWAYAM MOOC is a good initiative by the Ministry of Education, Government of India. This platform provides all Open Educational Sources under one roof. In developing countries like India, there are many economically disadvantaged students who do not have access to broadband and laptops. In situation like this digital learning might not be the ideal solution or it cannot be a substitute tool for teaching and learning. Inorder to develop the OER facilities, the Union Government, State Government, Higher Educational Institutions, and stake holders to take remedial measures to develop the MOOC platform each and every corner of the country. Similarly higher educational institutions have to create awareness programmes about the SWAYAM MOOC courses among the students, faculty and the village people. Further each institution Nodal officer has to be appointed and Single Point of Contact (SPOC) as directed by the NPTEL-SWAYAM. Definitely this course of action will create more awareness among the students, research scholars and faculty for the development of Open Education System.

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# Study of the Challenges about Using MOOCs

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## Abstract

*In 21st century new education policy is launched by the government. It has a wide scope for maintaining quality education in each and every area of the education field. Today's education field follows traditional ways of teaching and learning. It's time to change education. Everyone should follow the new and modern technology in teaching learning process. Teachers should learn new pedagogical skills properly and every teacher should apply it in the classroom. It is also important to get the knowledge of new and emerging trends in higher education and libraries should have got new technologies in the libraries new software's like INFLIBNET, open access; it's knocking the doors of the new era of education. Teachers and learners each one should acquaint with this.MOOC means Massive open online courses in formal education. A massive open online course (MOOC) is a model for delivering learning content online to any person who wants to take a course, with no limit on attendance. There are some drawbackswhile using the MOOC in higher education. Besides it MOOC is important to the learners to get the knowledge and education through online mode because it offers so many opportunities to learner.*

**Key words: -** *MOOC, challenges, opportunities, benefits of MOOC*

## Introduction

In 21st century new education policy is launched by the government. It has a wide scope for maintaining quality education in each and every area of the education field. Today's education field follows traditional ways of teaching and learning. It's time to change education. Everyone should follow the new and modern technology in teaching learning process. Teachers should learn new pedagogical skills properly and every teacher should apply it in the classroom. It is also important to get the knowledge of new and emerging trends in higher education and libraries should have got new technologies in the libraries new software's like INFLIBNET, open access; it's knocking the doors of the new era of education. Teachers and learners each one should acquaint with this. Let's see what is mean by MOOC.

MOOC means Massive open online courses in formal education. A massive open online course (MOOC) is a model for delivering learning content online to any person who wants to take a course, with no limit on attendance. There are some

drawbacks also to the learners to get the knowledge and education through online mode. But it offers so many opportunities like to learn according to their own space though it.Some experts pointed out its drawbacks. But traditional methods of teaching and learning are not useful in modern era besides the conventional modes ofteaching such as lectures, videos and reading material; MOOCs also provide a platform for interactive forumslike

1) Learning according to the learners' viewpoint

2) Space for learning

3) No bonded timeline or any distance barriers.

There are lot of universities and online platforms offering the quality MOOCs. Here are the most popular ones

- Coursera
- edx
- Udacity
- Udemy
- Kadenze
- Future learn
- Swayam

These are cost free. May be MOOCs are the evolutionary turning point in higher education.One can see MOOCs as a tool for facing the challenges in the changing world. We should ready for it. MOOCs are the necessary in modern world. It may look like a capacity builder of higher education. We cannot ignore or avoid it.Some of the important things or important aspect related to the MOOC is like

1. Through MOOC Courses are offered for free. It is economically good.

2. Access to courses offered by professors at the top schools

3. Courses are available to a vast and diverse audience across the globe

4. Learners' performance can be monitored easily using the data captured during the start of courses

5. Both professors and learners get world-wide exposure, thus improving pedagogical techniques and knowledge sharing

6. Can be used as a tool in a blended learning program, where students can access more information than what is provided in the class

There are few benefits that MOOC can provide to the learners for self learning. It is also economically good. As we know that the digital University is knocking the door of modern era education. We should be ready for it and in higher Education every person should acquire the digital skills to run otherwise we cannot compete with other developed countries. There are few challenges to run or to use MOOC in higher education. It is as follows.

1. Lack of development of communication skill properly. In such types of courses face to face effective communication cannot be take place in learning.

2. Lack of development of cooperation skill properly. In such types of courses there is lack of the development of cooperative learning because individual can take part in all activities not in pair or in group. Cooperative learning strategy is very important for development of soft skills.

3. Lack of competent users of MOOC. There is need of proper training about handling the MOOC's courses. For that competent or experts in ICT are required.

4. Many of the courses offered through the MOOC is in English language.It has language barriers. So many universities offered such types of courses which are particularly in English language. Regional or local languages are ignored in it.

5. If we study the application of the MOOC, it is very difficult to assess the students progress individually. It is difficult to follow proper track of assignments and involvement.

6. No scope for physical activity. Due to the online mode of instruction there is no scope for physical activity. So it is difficult to develop students' motor skills.

7. Most important factor related to the MOOC is that it is very difficult to use it for the disabled students. It is not useful for disable students.

8. It can be difficult to use if there is problem in internet connection. Particularly in rural area there is often problem of proper internet connection.

9. Learner can learn better if he/she got instant feedback. It is very difficult to give personal attention to each and every student. It is difficult to give personal attention to learn.

10. Threat of screen addiction may be there. Students become the screen addict and so many psychological problems created while learning through online mode.

## Conclusion

According to the above discussion on MOOC, Though there are a few drawbacks or demerits, MOOCs have a lot of potential for reinventing the way we learn. It will be interesting to see how they progress and grow over time! It is depended on the users' will power how to adapt such types of new modern skills in education.If we neglect some of the drawbacks like lack of development of communication skill properly, lack of development of cooperation skill properly, lack of competent users of MOOC, no scope for physical activity etc. MOOC is very important in higher education for many learners.

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# Awareness and usage of SWAYAM MOOCs among Under Graduate Students : A study in and around Tirupati

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## Abstract

*The Government of India initiated SWAYAM (Study Webs of Active-learning for Young Aspiring Minds), with an objective to take the best teaching and learning resources to all students at free of costs.The solution to this lies in ICT and developing course modules for MOOCs. MOOCs provide mechanisms to reach a large number of learners at any stage in their education or professional development.To find out the awareness and usage of SWAYAM courses survey method was applied among under Graduate students, in and around Tirupati. To collect data from selective Degree college students a structured questionnaire was prepared.*

**Keywords**: *Swayam, MOOCs, Online Courses, Under Graduate students, Internet*

## Introduction

Education is the essential element for the progress of any country. The quality of education in India is a challenge to the nation. With the development of information and communication technology (ICT), knowledge acquisition process is not just limited to the traditional classroom but it spreads anywhere now the learners can able to read from anywhere and anytime. SWAYAM is an indigenous (Made in India) IT Platform for hosting the Massive Open Online Courses (MOOCs). 'Study Webs of Active Learning for Young Aspiring Minds' (SWAYAM), as an Indian MOOC, has been providing several courses in various disciplines. To bring the best quality learning resources across the country, Government of India has bring a modern educational method called "Massive Open Online Courses (MOOCs)" to attract students as well as aspirants to learn more informative and innovative education. The term MOOC was found in 2008 by Dave Cornier of the University of Prince Edward Island and Bryan Alexander of the National Institute for Technology in Liberal Education. MOOC is an extension of "Open Educational Resources" movement which contribute positively to all forms of classroom types

available – Distance education, online learning and Traditional classroom session". "Massive" means a few hundred thousand students can join it simultaneously. "Open" means it is openly accessible to anybody, anywhere, anytime 27x7x365 with the free use and reuse (with legitimate restrictions) of the source material. "Online" indicates that it is offered through the web. "Course" stands for a self-paced class, usually of 4-8 weeks, with students joining across the continents and interacting virtually and certificates or "statement of accomplishment" is awarded to the successful students after evaluation of exams online assignments either by auto grader or peer group. It is planned in such a way that huge number of learners can able to enroll, it is open to anyone, available online via internet and courses are not referring only content delivery but it includes other aspects like lecture, forums, peer-to-peer interaction, quizzes, exams, and credentials (Samanta A, 2018).

## Types of MOOCs

MOOCs are categorized into two types such as cMOOCs which stands for connective Massive Open Online Courses that share digital online learning elements and environments and are connected together in a variety of ways where as xMOOCs popularly known as extended Massive Open Online Courses tend to be based on content provided by universities and other educational institutions that provide significant research based content and background in the online learning content.

## MOOC Platforms in India

Governmen of India has taken many initiatives to support online education, which eventually used to continue education for many people, and help to increase enrolment ratio of the nation. In India NPTEL, mooKIT, Coursera, and SWAYAM, IIT Bombay X, Shikshit India, Apna Course, Digital Vidya are the important online platforms.

## Objectives of the Study

The objectives of the study are

- To find out the awareness and usage of SWAYAM MOOCs among Under Graduate College Students in and around Tirupati.
- To assess the factors influencing the under graduate college students .
- To find out the time spent on learning SWAYAM MOOCs.
- To find out the problems faced by students while pursuing the courses.

## Limitation of the study

The present study is limited to selected Under Graduate Students in and around Tirupati. Due to lack of time and money, the sample survey was limited to the Under Graduate studentsin and around Tirupati.

## Methodology

In this study, a survey method was used. For data collection structured questionnaire was designed. The sample of 300 students was selected using proportionate stratified random sampling in selected Under Graduate students in and around Tirupati. The data was collected during the months of December and January 2021 &2022. For collecting data the investigator personally visited students and distributed 300 questionnaires among the students and get 204 filled in questionnaire received back with the percentage of 68.

**Table 1 Distribution of respondents according to their response**

| No of Questionnaires | No of Respondents | Percentage |
|---|---|---|
| Received | 204 | 68 |
| Not Received | 96 | 32 |
| Total | 300 | 100 |

## Analysis and Discussion

**Table 2: Distribution of respondents according to their gender**

| Name of the College | Respondents | Gender | |
|---|---|---|---|
| | | Male | Female |
| SV Arts College | 48 (23.52) | 34 | 14 |
| SGS ArtsCollege | 62 (30.39) | 48 | 14 |
| SPW Degree college | 14(06.86) | 00 | 14 |
| Seicom Degree College | 22(10.78) | 14 | 08 |
| Gate Degree College | 30 (14.70) | 16 | 14 |
| ATN.s Degree College | 28 (13.72) | 12 | 16 |
| Total | 204 | 124 | 80 |

Table 2 shows that the gender wise distribution of the responses received from the students of various colleges. The analysis indicates that out of 204 respondents 30.39% of the respondents come from SGS Arts college, followed by 23.52% of the respondents belong to S V Arts College, 14.70% among them relates to Gate Degree college, 13.72% belong to ATNs Degree college, followed by 10.78% of them hails from Seicom Degree college and the rest of 6.86% of the respondents belong to SPW Degree College. Further male respondents are more than female respondents in SGS Arts college, SV Arts college, Seicom Degree college, Gate Degree college whereas female respondents are more than male respondents in ATN Degree college.

**Table No 3:Distribution of respondents according to their Awareness on SWAYAM, MOOCs**

A question has been put to the respondents to know their awareness on SWAYAM MOOCs. The replies given by them are presented in Table No 3

| SWAYAM, MOOCs courses | No of Respondents | Percentage |
|---|---|---|
| Aware | 146 | 71.56 |
| Unaware | 58 | 28.43 |
| Total | 204 | 100 |

Table No 3 implies that most of the respondents (71.56%) said that they are aware of the SWAYAM MOOCs and the remaining (28.43%) of respondents opined that they don't know about the SWAYAM MOOCs courses.

**Table 4:Distribution of respondents according to their source of awareness of SWAYAM,MOOCs**

A question has been put to the respondents to know their source of awareness on SWAYAM MOOCs. The replies given by them are presented in Table No 3

| Sources | No of Respondents | Percentage |
|---|---|---|
| Lecturers | 32 | 22.58 |
| Friends | 60 | 41.29 |

| | | |
|---|---|---|
| College portal | 06 | 03.87 |
| Social Media | 14 | 10.32 |
| Library Networks | 30 | 19.36 |
| Others | 04 | 02.58 |
| Total | 146 | 100 |

It is clear from Table No 4 that majority of the respondents (41.29%) who replied that their friends explained them regarding the SWAYAM, MOOCs followed by (22.58%) of respondents came to know about SWAYAM, MOOCs from their lecturers and some of the respondents (19.36%) who said that they have been identified by the library networks followed by (10.32%) of respondents who were influenced by social media, only (3.87%) of them have been known by college portal about SWAYAM, MOOCsand the rest of (2.58%) of the respondents known from others.

**Table 5: Distribution of respondents according to their response regarding the Opinion on the requirement of orientation programme onSWAYAM MOOCs**

A question has been put to the respondents to know their opinion on the requirement of orientation programme on**SWAYAM MOOCs**. The replies given by them are shown in Table No 5.

| Orientation program on SWAYAM, MOOCs | No of Respondents | Percentage |
|---|---|---|
| Yes | 88 | 60.02 |
| No | 58 | 39.72 |
| Total | 146 | 100 |

Table No 5 describes that most of the respondents (60.2%) are of the opinion that they require orientation programme followed by (39.72%) of respondents who said that they do not require it.

**Table 6: Distribution of respondents according to their enrolment for course in SWAYAM,MOOCs platform.**

A question has been put to the respondents to know the status of enrolment for**SWAYAM MOOCs**. The replies given by them are shown in Table No 6.

| Registration for SWAYAM MOOCs | No of Respondents | Percentage |
|---|---|---|
| Yes | 124 | 84.93 |
| No | 22 | 15.06 |
| Total | 146 | 100 |

Table No 6indicates that most of the respondents (84.93%) have been registered for SWAYAM MOOCs courses followed by (15.06%) of respondents who said that they have not enrolled for SWAYAM MOOCs courses.

**Table 7 Distribution of respondents according to their response on the College providing lab facility for SWAYAM course.**

A question has been put to the respondents to know their opinion on the arrangement of lab facility by the college for**SWAYAM MOOCs**. The replies given by them are shown in Table No 7.

| **College provide lab facility** | No of Respondents | Percentage |
|---|---|---|
| Yes | 88 | 60.02 |
| No | 58 | 39.72 |
| Total | 146 | 100 |

Table No 7 illustrates that most of the respondents (60.2%) have been accepted that their college is providing computer lab facility for SWAYAM MOOCs courses followed by (39.72%) of respondents who said that the college is not providing such facility for them.

**Table No 8 :Distribution of respondents according to their average time spent for SWAYAM courses per week.**

A question has been put to the respondents to know the amount of time spent on using SWAYAM MOOCs. The replies given by them are shown in Table No 8.

| Time | No of Respondents | Percentage |
|---|---|---|
| 1 to 2 hours | 38 | 30.64 |
| 2 to 4 hours | 52 | 41.93 |
| 4 to 6 hours | 24 | 19.35 |
| More than 6 hours | 10 | 08.06 |
| Total | 124 | 100 |

Table No 8 shows that majority of the respondents (41.93%) spend 2-3 hours for reading SWAYAM MOOCs followed by respondents (30.64%) who spend 1-2 hours for the same activity, similarly (19.35%) of them spend 4-6 hours for reading SWAYAM MOOCs and the remaining (8.6%) of the respondents spent more than 6 hours.

**Table 9 Distribution of respondents according to their satisfaction level on course instruction and syllabus.**

A question has been put to know the satisfaction with course instruction and syllabus. The replies given by them are presented in Table No 9.

| Level of satisfaction | No of Respondents | Percentage |
|---|---|---|
| Highly satisfied | 62 | 50.00 |
| Satisfied | 36 | 29.03 |
| Not decided | 20 | 16.12 |
| Not satisfied | 06 | 04.83 |
| Total | 124 | 100 |

It is clear from Table No 9 that majority of the respondents (50%) expressed the view that they have highly satisfaction with the available course instructions and syllabus, followed by (29.03%) opined that they are satisfied, (16.12%) of them have not in a position to decide on the existing syllabus and the remaining (4.83%) said that they have no satisfaction.

**Table 10 :Distribution of respondents according to their Problem faced while accessing SWAYAM MOOCs courses.**

A question has been asked to know the problems faced while accessing SWAYAM MOOCS. The replies given by them are presented in Table No 10.

| Problems | No of Respondents | Percentage |
|---|---|---|
| Unable to access them due to non availability of electronic gadget | 22 | 17.74 |
| Slow internet | 48 | 38.70 |
| Regular classes | 54 | 43.54 |
| Others | 00 | 00 |
| Total | 124 | 100 |

Table No 10 describes that majority (43.54%) of the respondents are unable to read SWAYAM MOOCs frequently as they have regular classes, followed by (38.70%) of the respondents have the problem of slow internet connectivity while accessing, and the remaining (17.74%) of the respondents are unable to access them due to non availability of electronic gadget.

**Findings**

The findings here will be related to research questions earlier mentioned to have an insight to the study, as follow:

- Majority of respondents (60.78%) participated in the survey are male students and the remaining (39.21%) are female students.

- Most (71.56%) of the respondents are aware of the SWAYAM MOOCs and the rest (28.43%) of the respondents are unaware of the SWAYAM MOOCs.
- Majority of the respondents (41.29%) are came to know about SWAYAM MOOCs from their friends, followed by (22.58%) known about SWAYAM MOOCs by their faculty and very least percentage (2.58%) from others.
- Most (60.02%) of the respondents opined that they require orientation programme from the college and the rest of (39.02%) expressed that they doesnot require orientation programme.
- Most (84.93%) of the respondents enrolled for the SWAYAM MOOCs and the remaining (15.06%) have not registered for the course.
- Most (60.02%) of the respondents opined that the college is providing computer lab facility to study SWAYAM MOOCsand the rest of (39.02%) have no such facility in their respective colleges.
- Majority (41.93%) of the respondents used to spent 2 – 4 hours on SWAYAM MOOCs per week, very few (8.6%) among the respondents spent 6 hours per week.
- Majority (50%) of the respondents expressed that they are highly satisfied with the available course structure and syllabus, and only (4.83%) of them are not satisfied.
- Majority (43.54%) of the respondents are being faced problems for non utilization of their SWAYAM MOOCs due to non availability of time as they are engaged in their regular class work.

## Conclusion

In India SWAYAM is being developed to uplift the knowledge and information for the young minds that has the right to access the learning sources and to enrich their skills in the required field. The researcher has found from the survey taken on the programme SWAYAM has its positive way of producing and bringing out young talented mind to society. The result shows us the respondents have enthusiasm towards acquiring the knowledge through online courses because it saves their time and it teaches us at any time. The learning resources can be viewed many times until the respondents understand the subject. The result gives us the report that male respondents are more involved in doing the online courses when compared to female respondents. It is observed that eventhough they are aware of the course

they are unable to concentrate on the SWAYAM MOOCs due to their regular class work. The study recommended that extra classes will be maintained by the college management to make use the SWAYAM MOOCs which are very useful to the students.

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# Massive Open Online Course (MOOCs) In India: An Overview

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## ABSTRACT

*Massive Open Online Course (MOOCS) is an online course aimed at unlimited Participation and open access Via the Web. MOOCS Provide interactive user forums that help build a community for students, Professors and Teaching assistants. MOOCS have recently received a great deal of attention from the media, Entrepreneurial venders, Education Professionals and Technologically literate sections of the public. MOOCS will provide free to access cutting edge courses to students of higher education in India. In recent years, the enrolment in massive Open online Course (MOOCS) has increased tremendously. India after USA is dominating the global growth in enrolments. Seeing the growth of enrolment from the country and satisfy their need of education. India has started various projects for offering MOOCS courses. Currently, NPTEL, MOOKIT, IITBXand SWAYAM are the platforms used in India for offering courses. In this paper, a theoretical and Technical back ground of these platforms is provided with a discussion of their features of MOOCS. There are some challenges that are faced in implementing MOOCS in India. It finally discuss about issues address by SWAYAM.*

**KEY WORDS:** *MOOCS,NPTEL,SWAYAM, Indian MOOCS platform*

## INTRODUCTION

Online learning uses technology for delivering the courses. Education with technology is considered as most promising development in education. With technology globalization, the concept of learning and teaching has undergone a tremendous change. Technological usage in education provides global learning environment, which allows accessing the course material anytime, anywhere, connect other learners, and get access to the content without considering any geographical boundaries. The significant changes in use of the technology in online education has seen emergence of the concept of Massive Open Online Course

(MOOC). Massive Open Online Courses (MOOCs) are either free or paid open online courses offered by some of the world's leading universities and institutions including but not limited to Stanford, Oxford, Harvard, and Massachusetts Institute of Technology (MIT). It is a gathering of participants, of people willing to jointly exchange knowledge and experiences for each of them to build upon.

Here, introduction of the Indian MOOCS platform is presented by unveiling their potential, technology used, and features supported. The author has formulated a list of features provided by each of these platforms. Furthermore, based on the data collected from the web, using a tool, the MOOCS platforms are compared. Here, various measures are covered for three categories 1) Website, 2) Website Audience, and 3) Traffic Sources. Each category further has sub categories providing different level of details, for each platform. Also, author has mentioned some of the challenges to offer MOOCS in India and confined the solutions for these issues through the SWAYAM platform.

In this paper, Section II provides a discussion on potential of MOOCS in India. Section III provides an overview of the MOOCS in India with different platforms. Section IV explains what technology is used by these platforms. Section V explains their different features. Section VII discusses the challenges for MOOCS in India followed by the solutions offered by SWAYAM in section VIII. Section IX states the conclusion.

## POTENTIAL OF MOOCS IN INDIA

MOOC has a huge potential veiled in India. Recent years have seen tremendous hike in the enrolment by Indian students in MOOCS all over world. India is among the leading countries in terms of enrolments in courses offered by many popular MOOC providers including EDX, Coursera, and Udacity.

## MOOCS PLATFORMS IN INDIA

Many initiatives have been taken by the Indian government to provide and support concept of open education. Initially, the objective was to provide open resources in terms of repositories, libraries, educational media files, e-books, etc. These were made accessible for everybody. Some of the efforts in this direction started as National Digital Repository of IGNOU, SAKSHAT providing e-content, SHISHYA for XI-XII Standards by CBSE Board, and VidyaVahini integrating IT into the curriculum of rural schools by providing interactive training and developmental communication. Most of these initiatives started with establishing dedicated department to make education reachable to many learners as much as possible. Some of the common names in this path are, Education and Research

Network (ERNET) connecting various colleges and schools by providing network connectivity; EDUSAT, a satellite launched for education in India, Consortium for Educational Communication (CEC), use the power of television to act as means of educational knowledge dissemination;

**NPTEL**

NPTEL stands for National Programme on Technology Enhanced Learning. It is a project funded by MHRD, initiated in 2003. It is a joint initiative of seven Indian Institute of Technology (IITs) and Indian Institute of Science (IISC) for offering courses on engineering and science, initially.

**MOOKIT**

MOOKIT is a lightweight MOOCS management system built entirely using open-source technologies by Indian Institute of Kanpur (IITK), in 2014. It is a powerful system that can be used to offer online courses at any scale, from micro to massive. It is designed to offer MOOCS (connectivist MOOCS). It has been used in 15 courses with about 100,000 registered learners. It is built entirely using open-source technologies, and the core engine runs on the MEAN stack that uses java script based technology, making it extremely scalable.

**MOOKIT Standard**: It is used to run a single course. It does not require local streaming of video, but YouTube videos can be used. Example;mooconmooc.org.

**MOOKIT Enterprise:** It is suitable to run a large number of online courses. Users are a part of a portal and will be able to enroll in the courses they're interested in. Example; mooc4dev.org, and agmoocs.in.

**MOOKIT Replicated**: It is suitable for low bandwidth areas, by allowing the content to be cached on local servers. The serves will sync periodically for updates.

**MOOKIT Personal or Mobi-MOOKIT**: It can run on the devices with low computation and low storage capability as of mobile devices. It does not provide forum or social networking due to the device constraint.

**IITBombayX**

IITBombayX is a non-profit MOOCS platform developed by IIT Bombay using the open-source platform Open EDX, in 2014. It was created with funding from National Mission on Education through Information and Communication Technology (NME-ICT), Ministry of Human Resource Development (MHRD), Government of India. Currently, it is offering 63 courses on different subjects from multiple disciplines. Some of the courses provided.

## SWAYAM

SWAYAM stands for "Study Webs of Active Learning for Young Aspiring Minds". It is a MOOCS platform, launched by the Ministry of Human Resource Development (MHRD), Government of India, to bind online and offline education together. It is started with an expectation of launching 2,000 courses, to make it largest course catalogue, among all provided so far. SWAYAM is an independent platform. Learners across the country can get credit for MOOCS courses offered on SWAYAM, and they can get their credits transferred and recognized at the parent institution, that was not possible in conventional MOOCS platforms.

For SWAYAM, a credit framework has been finalized that would allow the transfer of credits between institutions. An academic institution in India can offer up to 20% of its catalogue in a particular program via SWAYAM.

**Some Indian MOOCS Platforms and Providers**

| Initiative | Year of Launch | Institution Behind Platform | Website Link |
|---|---|---|---|
| NPTEL | 2003 | IIT Madras | nptel.ac.in/ |
| MOOKIT | 2012 | IIT Kanpur | www.mookit.co/ |
| IITBX | 2014 | IIT Bombay | iitbombay.in/ |
| SWAYAM | 2016 | MHRD and Microsoft | Swayam.gov.in |

## TECHNOLOGY USED

For offering MOOCS, interested institutions have an option to go for self-hosted platforms, or use proprietary platform such as, Coursera, Udacity etc. When using self-hosted platform, the providers can choose to 1) develop their own MOOCS platform as done by IITK by developing MOOOKIT, or 2) use open-source platform available already. Indian government always believes in promoting the use of existing open-source platform as their preference. These platforms may require modification and customization as per the needs. Currently, NPTEL and

IITBX are live examples of such effort working effortlessly using the open source technology.

### A. Coursebuilder

NPTEL courses are run on CourseBuilder, which is an open-source platform created by Google in 2012. It tie together the software and technology Google used to build their Power Searching with Google online course. Anyone can offer their own courses using course builder platform. It provides basic services such as Google accounts, hangouts, friend circles, which could be used as the social networking feature, if implemented properly. Yet, the platform does not incorporate social networking as such. Course Builder is built on Google app engine

### DRUPAL

MOOKIT platform is developed using DRUPAL, an open-source Content Management System (CMS). Drupal is used as a back-end system for at least 1.5% of all websites worldwide ranging from personal blogs to corporate, political, and government sites. It is also used for knowledge management and business collaboration. Drupal base code is written in PHP and it provides the user various Drupal APIs to work with and implement any feature on their own, or use contributed modules if the feature is already implemented. It is hosted on Apache Web Server as an application. Drupal has a massive support of around 6500 contributed modules which extend features provided by Drupal core.

### B. Open EDX

IITBX is powered by the Open EDX . It is an open-source release of EDX platform in 2013. EDX is founded by Harvard University and Massachusetts Institute of Technology (MIT). Open EDX platform is being used by educational providers to host their own MOOCS, all over the world. Including MOOCS, it can also used to host smaller classes and training modules. Also, educators can extend the platform to build learning tools that precisely meet their needs, and developers can contribute new features to the Open EDX platform, due to nature of its availability as an open-source. Currently, it being used by various elite universities like, stand ford, and the organizations such as Microsoft, and two Indian MOOCS, IITBX and SWAYAM are also on the list. The complete list of its users is available.

### C. SWAYAM

It is being run on an independent platform is created in cooperation with the Microsoft. This platform is launched very recently and is in growing stage, so much of its details are not yet available.

## FEATURES OF MOOCS PLATFORMS

During our study, we carefully analysed the platforms to be familiar with their features. Based on our understanding of studied platform, we have identified certain features of MOOCS platform. MOOCS courses have a schedule with staring and end date. Also, there are some self-paced courses that do not have any time restriction to join a course and always available for enrolment. Self-paced courses are only 6% .All MOOCSoffered supports face-to-face learning, while in online learning as in MOOCS, the instructions are delivered in the form of platform, which provides some specific feature. For example, for the native users of different origin belonging to various states/ countries, not the content but the platform itself is provided in multiple languages.

**FEATURES OF THE MOOC PLATFORMS**

| Providr | Course Format | Learning Model | No.of Courses | No.of Users | Institutional Credits | Platform Language | Mobile App | App Platform |
|---|---|---|---|---|---|---|---|---|
| **NPTEL** | Scheduled | Online | 1200 | 1.5 Million | Partial | English | Yes | Android |
| **MOOKIT** | Scheduled | Blended | 15 | 0.1 Million | Partial | English,Hindi, Kannada, French,Russian, Ukrainian | No | - |
| **IITBX** | Scheduled, Self-Pace | Online | 63 | 1.25 Million | Partial | English | No | - |
| **SWAYAM** | Scheduled, Self-Pace | Blended | 172 | Not Known | Yes | Hindi, English | Yes | Android iOS |

## ISSUES ADDRESSED BY SWAYAM

Education is the foremost sector that shoulders the biggest responsibility of shaping the future of any nation. India is presently facing multiple challenges in offering education through MOOCS. India has started their own MOOCS as SWAYAM, an effort of the government in making the education accessible for all irrespective of any factor such as, their educational qualification, geographical disparity. There are several issues in delivering MOOCS, as discussed in previous section. Some of these issues addressed by SWAYAM are:

**1. Technological Infrastructure:** Before launch of SWAYAM, it was clear that as a provider they need the technical infrastructure, for two primary areas; a) access and delivery, b) course content creation. For the access to the network, connections across the institutions/schools and a backbone providing the advanced capabilities has started as a national initiative by the government. Moreover, to create course content, government is investing by partnering with the institutions (IITs,IIMs, IISC, UGC), which are competent in a specific area of education. Also, for the time being until the connectivity reach to each school or college, some local centers are established to train the instructors or teachers for using the platform.

**2. Investment:** SWAYAM is a fully government funded project that covers cost of everything such as, content creation, technical infrastructure, maintenance, human resources. For technical support the government has signed a deal of 38 crore with Microsoft. According to a report published by UGC, the fund has been allotted to all the contributing institutes of SWAYAM for fasten the process of delivering the targeted courses.

**3. Diversified Needs:** To satisfy the diversified needs of the Indian learners, firstly the platform is available in both, English as well as Hindi language. It will surely minimize the language barrier for the learners.

**4. Adoption of MOOCS among learners:** Since SWAYAM supports the blended learning where after learning from the online courses the learner will also go to their college/institute. The learner will experience face-to-face learning along with the online learning. So, the lack of oral communication is not the problem anymore. It will surely help in improving the adoption of courses among the learners.

**5. Quality:** For technical expertise the government has already hired Microsoft. Furthermore, to enhance the expertise of the teacher or instructors in using the courses offered by SWAYAM, some training programs, workshops are being done all over India at the regional and local centers created for the purpose. These programs are organized by the top institutions that are contributors of SWAYAM such as, IITs, IIMs, and central universities etc. The focus of these programs is to produce more qualified and technically sound faculties to deliver quality education to the learner. Also, these faculties will be able to solve problems of their learners who belong to the same institution as of faculty.

## CONCLUSION

There are various MOOCS platforms that are being used in India for offering the courses, such as, NPTEL, MOOKIT, IITBX, and SWAYAM. Except the NPTEL, these are the new platforms having history of hardly 4 to 5 years, while SWAYAM

is launched very recently. Therefore, to set up a ground for understanding including theoretical as well as technical aspects, a discussion is provided about each of these platforms with their features. Also, while using these platforms it is needed to understand their current state, popularity among learners, use of social media for referring, searched etc, and several other parameters or features mentioned here. Some of these issues are already addressed by SWAYAM, which is the most recent platform. According to the research carried out by the authors in some selected colleges in India, little has been heard of Massive Open Online Courses (MOOCS), rather prestigious colleges have embraced the Small Private Online Courses (SPOCS) because of the limitations faced by MOOCS

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# SWAYAM: The Platform for Modern online Education

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ABSTRACT

*The quality of education in India is challenge to the nation. The MOOC is the modern day quality education tool to educate the mass at minimum cost and efforts. Government of India (MHRD) is making an effort to develop online national portal for quality education called SWAYAM. SWAYAM offers online courses to any learner of the nation at free/minimum cost with the help of ICT based on edX platform. These courses is fully taken through online aimed at unlimited participation and open access via the web. 'Study Webs of Active Learning for Young Aspiring Minds' (SWAYAM) is a jointly initiative by Ministry of Human Resource Development (MHRD) and All India Council for Technical Education (AICTE), Government of India to provide an integral teaching learning platform in online mode. SWAYAM is mobile and web based interactive open education interface where courses are found from high school to university level (Government of India, 2015). SWAYAM is designed to achieve the three primary principles of education policy such as, access, equity and quality.*

Key Words: SWAYAM, MOOCS, *online learning, Distance Learning, Digital India.*

## INTRODUCTION:

The MOOC is massive open online course (MOOC) is popular in western world and India is not

exceptional to this, many Indian are also using the MOOC platform for their technology and kill enhancement in all the fields. The most of the courses of MOOC are aimed at unlimited participation and open access via the web so there is no boundaries for sharing the knowledge. The first MOOCs emerged from the open educational resources (OER) movement. The term *MOOC* was coined in 2008 by Dave Cormier of the University of Prince Edward Island in response to a course called *Connectivism and Connective Knowledge.*

They are known as 'massive' because they are available for the masses. These courses is fully taken through online aimed at unlimited participation and open access via the web. MOOCs is a model that gives online learning content to learner without any physical presence in the classroom. MOOCs is planned in such a way that massive number of learners can able to enroll, it is open to anyone, available online via internet and courses are not referring only content delivery but it includes other aspects like lecture, forums, peer-to-peer interaction, quizzes, exams, and credentials (Samanta A, 2018). There is a large possibility that improvement of quality of pedagogy can be occurred by MOOCs. 'Study Webs of Active Learning for Young Aspiring Minds' (SWAYAM) is a jointly initiative by Ministry of Human Resource Development (MHRD) and All India Council for Technical Education (AICTE).




Fig.1: Logo of the SWAYAM.

Government of India to provide an integral teaching learning platform in online mode. SWAYAM is mobile and web based interactive open education interface where courses are found from high school to university level (Government of India, 2015).

SWAYAM is designed to achieve the three primary principles of education policy such as, access, equity and quality. Learning in SWAYAM has four step approaches.

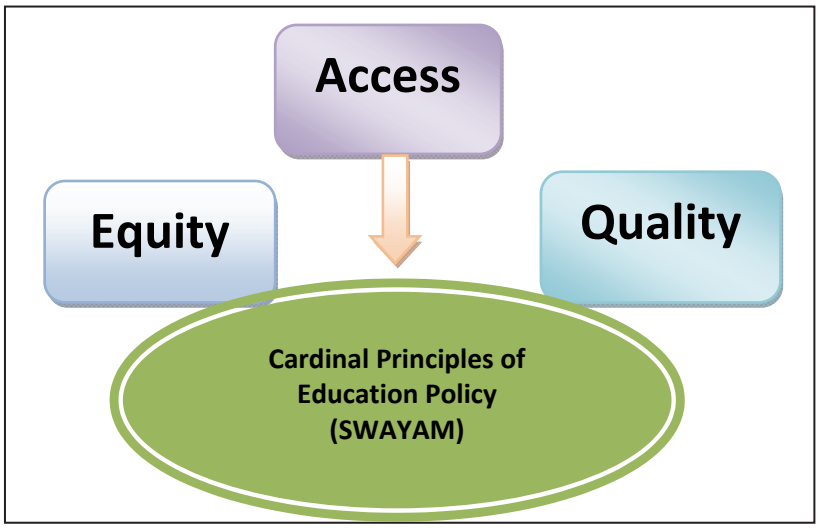



Fig.2: The Core of SWAYAM profile

Quadrant -I (**e-Tutorial**) ® Quadrant-II (**e-Content**) - Quadrant-IV ¬ Quadrant-III (**Assessment**) (**Discussion forum**) Nine National Coordinators have been appointed to ensure best quality content are produced and delivered. Nine Coordinators are AICTE (All India Council for Technical Education) for self-paced and international courses, NPTEL (National Programme on Technology Enhanced Learning) for engineering, UGC (University Grants Commission) for non technical post-graduation education, CEC (Consortium for Educational Communication)for under-graduate education, NCERT (National Council of Educational Research And Training) & NIOS (National Institute of Open Schooling) for school education, IGNOU (Indira Gandhi National Open University) for out of school students, IIMB (Indian Institute of Management, Bangalore) for management studies and NITTTR ( National Institute of Technical Teachers Training and Research) for Teacher Training programme.

The courses that is delivered through SWAYAM are available free of cost to the learners. It students wants certificate, certificate is offered after successful completion of course with a little fee. At the end of the course, assessment of students through examination is taken and marks/grades secured in this exam could be transferred to the academic record of the students. SWAYAM would be ultimately capable of hosting 2000 courses and 80000 hours of learning-covering school, under-graduate, post-graduate, engineering, law and other professional courses.

MOOCs

The full form of MOOCs is 'massive open online courses' that is popular in western world. Now, many Indian's are interested to MOOCs. Many Indian's are also using this platform for heir technology and skill enhancement in all the areas. The most of the MOOCs courses are purposed for unlimited participation and open access via the web. There are no boundaries to share the knowledge. The term MOOCs was raised in 2008 by Dave Cornier of the University of Prince Edward Island and Bryan Alexander of the National Institute for Technology in Liberal Education (Hiremath R, 2017). A 'massive open online course' (MOOC) is an online course purposed at unlimited participation and open access via the web. As the name itself reveals the MOOC is,

SWAYAM

The full form of SWAYAM is 'Study Webs of Active Learning for Young Aspiring Minds'. The SWAYAM is a digital platform developed by Ministry of Human Resource Development (MHRD) and All India Council for Technical Education (AICTE), Government of India with the help of Microsoft. SWAYAM is designed to accomplish the three most primary principles of Education policy like access, equity and quality (All India Council for Technical Education, 2017). The objective of creating SWAYAM is to take the best teaching learning resources to all including the most disadvantaged group. This platform is intended to host about 2000 courses 80000 hours of learning materials within 2 to 3 years on SWAYAM: covering maximum numbers of courses like school, under-graduate, post-graduate, engineering, law and other professional courses (Ministry of Human Resource Development, 2017). The courses hosted on SWAYAM are displayed in 4 quadrants.

Four quadrants of SWAYAM are described in following below table

**Table 1:** Four Quadrants of SWAYAM

| | |
|---|---|
| **SWAYAM (Quadrants)** | **Quadrant-I:** e-Tutorial: lecture by video (using audio-video, multi-media, animation). |
| | **Quadrant-II:** e-Text: Specially prepared reading materials (PDF, Text, e-Books, illustrations, presentation, related links, research papers, articles ) that is downloaded. |
| | **Quadrant –III:** Discussion forum: Arranged for raising doubts and clarifying them by Course Coordinator or his/her team. |
| | **Quadrant –IV :** Self-assessment Tests: It contains problems and solutions that is in the form of Multiple Choice Questions, Fill in the blanks, Matching Questions, Short Questions, Long Questions, Quizzes, Assignments and solutions, Frequently Asked Questions (FAQs) and providing clarifications on misconception of any topic, |

National Coordinators have been appointed to ensure best quality content are produced and delivered.

Table 2: Nine Coordinators involved in SWAYAM

| SWAYAM Coordinators | | | | | |
|---|---|---|---|---|---|
| School Education | Out-of- school education | Under-graduate education | Post-graduate education | Teacher Training Programme | Self-paced |
| ( I ) National Institute of Open Schooling ( II ) National Council of Educational Research and Training | ( III ) Indira Gandhi National Open University (IGNOU) | ( IV ) Engineering education (National Programme on Technology Enhanced Learning) ( V ) Management education (Indian Institute of Management, Bangalore) ( VI ) Consortium for Educational Communication | ( IV ) Engineering education (National Programme on Technology Enhanced Learning) ( V ) Management education (Indian Institute of Management, Bangalore) ( VII ) University Grants Commission (UGC) | ( VIII ) NITTTR ( National Institute of Technical Teachers Training and Research) | IX ) AICTE (All India Council for Technical Education) |

UGC and AICTE have revealed 'Credit Framework for learning courses in online through SWAYAM, Regulation 2016'. UGC adviced to the University to identify courses where credits can be transferred on to the record of academic of the students for courses done on SWAYAM. SWAYAM Android Mobile App/Google Play/IOS Availability of SWAYAM is through Android Mobile App/Google Play/IOS (iPhone Operating System) that can be downloaded by anyone who aspiring to pursue studies through MOOCs and can get registered as a learner or a

student for any course starting from standard 9th till post-graduation (All India Council for Technical Education, 2017).

SCOPES OF SWAYAM:

According to Government of India (Department of Higher Education, Ministry of Human Resource Development, 2015) SWAYAM cover the following below disciplines (Hiremath R, 2017). A. Curriculum based course contents covers various disciplines like arts, science, commerce, performing arts, social sciences and humanities subjects, engineering, technology, law, medicine, agriculture etc. in higher education sectors (all courses offers certificate also). B. SWAYAM offers school education modules for teacher training as well as teaching and learning assistances to children of India and try to help them understand the subjects and subjects matter better and also boost them in better preparedness for competitive examinations for admissions to professional degree programmes. C. Skills based courses are also in SWAYAM that helps the students specially after higher secondary examination. It specially helps the polytechnics students and it prepare the learners for working in industry. D. UGC adviced to the University to identify courses where credits can be transferred on to the record of academic of the students for courses done on SWAYAM. E. Curriculum and courses that can meet the needs of learners of Indian citizens in India specially and in abroad.

ADVANTAGES OF SWAYAM:

Following below points mentions about the some advantages of using SWAYAM by Indian learners.

- For any Indian learner, SWAYAM is absolutely free of cost for learning but some fees is applied in case of certificate.
- The SWAYAM is a new platform to Indian learner that is complimentary to formal education in India.
- The learners who are in Indian University and institutions cannot get quality teachers but SWAYAM is a platform by which any of the learners can get easily attached with the best teachers like the teacher of IITs, IIMs etc.
- The courses will attached to the skill India program.
- It is the very good platform because anyone can registered and can study through SWAYAM that means opportunity is being given to everyone.
- The high quality education will reach to the everyone at minimum cost and endeavor by the government of India.

Conclusion:

SWAYAM is a digital platform by which any one can easily register and study in anytime. It is very cost effective way of learning. It will be benefitted specially those students living in village area or disadvantaged group who do not get quality teaching. But one problem is still now in many villages in India, that is, their low economic condition. the lower economic condition, they can not buy the digital device like mobile phone, computer etc. According to me, if digital devices like computers is included in the all schools, colleges and universities of India, the learners or students will be more benefited because they will get more quality teaching from best institutions. One thing that I observed to write this review is that learning through SWAYAM, is very good initiative that started by Government of India and it will be more beneficial for future generation. MOOCs are the future solution of today's distance learning through the platform like SWAYAM in India.

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# Usage of E-ShodhSindhu Resources by Faculty and Research Scholars of Andhra University, Andhra Pradesh: A Case Study

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## Abstract

*Universities are attempting to play a significant role in research and development. The availability of library information resources and services is a significant factor in the research process. Faculty and research scholars are essential producers of research in universities, and access to information is a vital part of their research process. This research aims to investigate concerns such as user knowledge and use of E-ShodhSindhu electronic resources, as well as the impact of these issues on the purpose of electronic resource use and the location where users use these resources. The Simple Random Sampling technique together with a questionnaire was used for data collection from 259 Library users of Faculty and Research Scholars from Andhra University in Andhra Pradesh.. The study found that most of the respondents are 'very much' aware of E-ShodhSindhu resources but there is a need to conduct more awareness/training programs for enhancing the use of e-ShodhSindhu. The present study also attempts to know the problems faced by the users during accessing e- ShodhSindhu resources and subsequently received the opinions to maximize the usage of e- ShodhSindhu resources from the respondents*.

**Key words:** *Library consortium, e-ShodhSindhu, Digital Library, e-resources, e-journals, Andhra University*.

## Introduction

Electronic resources are an important aspect of libraries because they help users learn, teach, and do research. The introduction and spread of e-resources has

altered how liaison activities and collection development are approached, particularly in university libraries. Because of the impact of e-resources, the library concept has altered and its role has been redefined. University libraries assist students, faculty members, and research scholars in accessing materials for teaching, learning, research, and advanced studies in higher education. To provide simple access to their users, libraries purchase both print and electronic resources. No library can fully address the needs of their customers due to the ever-increasing demand for subscriptions and access to more e-journals by the user community. Because of the tremendous number of information available throughout the world, libraries began to think about information sharing in a community and among library communities a long time ago. Universities have begun to place a larger emphasis on research in recent years. Universities accomplish this through establishing suitable rules, providing finances and facilities for research, and encouraging their faculty and students to participate in research. Students in many academic programmes at universities are expected to complete a research project and submit a report as a condition of graduation. Faculty members and research scholars must also do their own research and are evaluated on the results of their research. This activity may help them privilege a wide variety of information services, which remain within the restricted budget.

## E-ShodhSindhu Digital Library Consortium

In a cooperative agreement between groups of libraries, Library Consortia is a network for the purchasing and accessing e-information to provide immediate access to greater resources for users of individual libraries. Library collaboration and resource distributing in India signified in the 1980s with the emergence of several library systems. In December 2015, E-ShodhSindhu was established by the merger of 3 consortia based on a proposal from an Expert Panel, namely the UGC INFONET Digital Library Consortium, the NLIST, and the INDEST- AICTE Consortium. E-ShodhSindhu continues to offer present as well as archival publications subscription to 10,000 core plus and peer-reviewed journals (including journals accessible via NLIST) and a variety, from several publishers and aggregators to its members, together with central-funded technical establishments, universities, and several bibliographic, quotation and accurate catalogs in various disciplines that are covered under 12 (B) and 2 (f) Sections of the UGC Act (inflibnet.ac.in).

## Andhra University

Andhra University was constituted at Vishakhapatnam of Andhra Pradesh in the year 1926 by the Madras Act of 1926. It is primarily planned as a residential

and teaching-cum-affiliating University and dedicated to post-graduate teaching and research. The University College of Arts was inaugurated on 1st July, 1931 and a year later, the College of Science and Technology was started. The University took a major step in introducing many new courses in Science, Arts, Management and Engineering in the country. The University designed and implemented Quality Management System successfully and became the first general University in the country to get ISO 9001: 2000 Certification in 2006. Further, to assure quality in Higher Education the University was assessed by National Assessment and Accreditation Council (NAAC) and awarded 'A' grade in April 2002. There are 365 affiliated colleges under the territorial jurisdiction of Andhra University. The University Presently is Offering 313 Courses in Arts, Commerce, Management, Science & Technology, Engineering, Law, Pharmacy and Education.

## Andhra University Library

The library was started in 1927 and rechristened Dr. V.S. Krishna Library in 1968 with houses over five lakh books and periodicals in its space of 60,000 sq ft. But this does not make the library unique; what makes it different is the collection of over 1,600 ancient manuscripts that are written or 'tala patra' (palm leaves). The library is effectively using SOUL software. Special facilities are provided for differently abled persons. A separate unit of books in Braille has been developed for visually challenged students. Reprographic facilities are provided. The library is kept open on all days in the year including Sundays, except on national holidays and on days declared as holiday by the University.

## Objectives of the Study

1. To know the awareness and frequency of visiting E-ShodhSindhu consortium resources in Andhra University.
2. To find out the most frequently used E-ShodhSindhu resources.
3. To know the purpose of using E-ShodhSindhu resources.
4. To identify the difficulties while accessing E-ShodhSindhu resources.
5. To find out the required activities to maximize the usage of E-ShodhSindhu resources.
6. To analyze the satisfactory levels of users while using E-ShodhSindhu resources.

## Scope of the Study

The study is mainly focused on usage of E-ShodhSindhu resources in university libraries. The scope of the study on the use of E-ShodhSindhu E-journals and databases is restricted to faculty members and research scholars of Andhra

University, which is located in Visakhapatnam of Andhra Pradesh. It is also limited to only 259 respondents constituting 40 faculty and 219 research scholars.

## Methodology

In order to accomplish the above set of research objectives, a survey method was used by the researcher to collect data from the respondents on usage of e-ShodhSindhu resources. A well-structured questionnaire was designed and distributed to 350 respondents, which constituting 100 Faculty members and 250 Research Scholars among Science and Social Sciences departments of Andhra University. The selection was based on simple random sampling method. Out of which, 259 filled questionnaires were received which comprised of 40(15.44%) Faculty members and 219 (84.56%) Research Scholars. The Questionnaire was distributed personally by visiting Departments, Computer Centres, Hostels, and Library. The collected data is presented in the form of tables and figures and analyzed by using a simple method of calculation.

## Analysis and Interpretation of Data

The following tables represent the analysis and interpretation of data pertaining to Andhra University Library of Andhra Pradesh State.

**Table 1: Gender wise distribution of Respondents**

| Gender | Faculty (N=40) | Research Scholars (N=219) | Total (N=259) |
|---|---|---|---|
| Male | 26(65.00%) | 155(70.78%) | 181(69.88%) |
| Female | 14(35.00%) | 64(29.22%) | 78(30.12%) |

It is observed from Table 1 that majority (65.00%) are male respondents from the Faculty members whereas only (35.00%) are female. Moreover, 70.78% male and 29.22% female respondents are from the Research Scholars. It is found that majority of the total respondents are male.

**Table 2: Distribution of respondents according to the subject of study**

| Subject | Faculty (N=40) | Research Scholars (N=219) | Total (N=259) |
|---|---|---|---|
| Science | 22(55.00%) | 120(54.79%) | 142(54.83%) |
| Social Sciences | 18(45.00%) | 99(45.21%) | 117(45.17%) |

Table 2 depicts that the majority 142 (54.83%) of the total respondents belonged to the Science subjects and the remaining 45.17 percent belonged to Social Sciences. As analyzed in the table, 55.00 percent respondents of faculty and 54.79 percent research scholars belonged to Science subjects, where as 45% of faculty and 45.21% of research scholars belonged to Social Sciences.

**Table 3: Distribution of respondents according to their age**

| Age in years | Faculty (N=40) | Research Scholars (N=219) | Total (N=259) |
|---|---|---|---|
| 20-30 | 2(5.00%) | 105(47.94%) | 107(41.31%) |
| 30-40 | 6(15.00%) | 85(38.82%) | 91(35.14%) |
| 40-50 | 15(37.50%) | 26(11.87%) | 41(15.83%) |
| Above 50 | 17(42.00%) | 3(1.37%) | 20(7.72%) |

It is obvious from Table 3 that the majority 107 (41.31%) of the total respondents belonged to the age group of between 20-30 years followed by 35.14 percent between 30-40 years, 15.83 percent who belonged to the 40-50 years age group and 7.72 percent who belonged to above 50 years age group. The table reveals that majority (42.00%) of faculty belonged to the age group of above 50 years followed by 37.50 percent between 40-50 years, 15.00 percent between 30-40 years and 5.00 percent between 20-30. Majority of the Research Scholars (47.94%) belonged to the age group of between 20-30 years followed by 38.82 percent

between 30-40 years, 11.87 percent between 40-50 years and 1.37 percent above 50 years.

**Table 4: Awareness on E-ShodhSindhu Consortium facility**

| Level of Awareness | Faculty (N=40) | Research Scholars (N=219) | Total (N=259) |
|---|---|---|---|
| Slightly | 9(22.50%) | 31(14.16%) | 40(15.45%) |
| Much | 11(27.50%) | 32(14.61%) | 43(16.60%) |
| Very Much | 20(50.00%) | 156(71.23%) | 176(67.95%) |

Table 4 reflect that the awareness among respondents about e-ShodhSindhu library consortium. It is observed that majority 67.95% of the respondents which constituted 50.00% of the Faculty and 71.23% of the Research Scholars were 'very much' aware of e-ShodhSindhu Library consortium. Only 15.45% of the total respondents which constituted 22.50% of the Faculty and 14.16% of the Research Scholars are 'slightly' aware of it.

**Table 5: Source of awareness about E- ShodhSindhu**

| Source of awareness | Faculty (N=40) | Research Scholars (N=219) | Total (N=259) |
|---|---|---|---|
| Teachers | 16(40.00%) | 132(60.27%) | 148(57.14%) |
| Library Professionals | 8(20.00%) | 37(16.89%) | 45(17.37%) |
| Colleagues and Friends | 6(15.00%) | 24(10.96%) | 30(11.58%) |
| Library Website | 6(15.00%) | 14(6.39%) | 20(7.72%) |
| Any other | 4(10.00%) | 12(5.48%) | 16(6.18%) |

The analysis of the data depicts from the Table 5 that majority 57.14% of the total respondents came to know about e-ShodhSindhu from their Teachers followed by 17.37% of the respondents came to know from Library Professionals. 11.58 percent of the respondents came to know from colleagues and friends and 7.72% of the

respondents know through 'Library website'. Only 6.18% of the respondents came to know about e-ShodhSindhu from their 'any other' source.

**Table 6: Frequency of visiting E-ShodhSindhu resources**

| Frequency | Faculty (N=40) | Research Scholars (N=219) | Total (N=259) |
|---|---|---|---|
| Daily | 5(12.50%) | 10(4.57%) | 15(5.79%) |
| Once in a week | 6(15.00%) | 10(4.57%) | 16(6.18%) |
| 2-3 times in a week | 9(22.50%) | 52(23.74%) | 61(23.55%) |
| 2-3 times in a month | 13(32.50%) | 96(43.84%) | 109(42.08%) |
| Occasionally | 7(17.50%) | 51(23.29%) | 58(22.39%) |

The analysis of the data from Table 6 revealed that majority 42.08% of the total respondents which constituted 32.50% of Faculty and 43.84% of Research Scholars visited e-ShodhSindhu '2-3 times in a month' followed by 23.55% of respondents which constituted 22.50% Faculty and 23.74% of Research Scholars visited e-ShodhSindhu '2-3 times in a week'. Moreover 22.39% of the respondents which constituted 17.50% of Faculty and 23.29% of Research Scholars visited 'occsionally'. Only 5.79% of the total respondents visited e-ShodhSindhu 'daily'.

**Table 7: Respondents spending time on E-ShodhSindhu resources**

| Time Spending | Faculty (N=40) | Research Scholars (N=219) | Total (N=259) |
|---|---|---|---|
| Less than one hour | 16(40.00%) | 115(52.51%) | 131(50.58%) |
| 1-2 hours | 10(25.00%) | 66(30.14%) | 76(29.64%) |
| 2-3 hours | 11(27.50%) | 32(14.61%) | 43(16.60%) |
| More than 3 hours | 3(7.50%) | 6(2.74%) | 9(3.47%) |

It is obvious from Table 7 that 50.58 percent of total respondents constituting 40.00 percent of Faculty and 52.51 percent of research scholars spent 'less than one hour' daily in E-ShodhSindhu followed by 29.64 percent spent less than '1-2 hours,

16.60 percent spent '2-3 hours' and the remaining 3.47 percent of total respondents spent 'more than 3 hours' in E-ShodhSindhu resources.

**Table 8: Most frequently Used E-ShodhSindhu Journals by the respondents of Andhra University Library**

| Usage of E- ShodhSindhu Journals | Total Respondents (N=259) | | |
|---|---|---|---|
| | No. of Responses | Percentage | Rank |
| American Chemical Society | 219 | 84.56 | **3** |
| American Institute of Physics | 182 | 70.27 | **8** |
| American physical Society | 216 | 83.40 | **4** |
| Annual Reviews | 223 | 86.10 | **2** |
| Oxford University Press | 191 | 73.75 | **6** |
| Project Muse | 188 | 72.59 | **7** |
| JSTOR | 197 | 76.06 | **5** |
| Spinger Link | 176 | 67.95 | **9** |
| Tayler and Francis | 228 | 88.03 | **1** |

Table 8 exhibits the usage of E-Journals from E-ShodhSindhu by the Faculty and Research Scholars of Andhra University. Based on the number of responses and percentage of the purposes are ranked. It is evident from the table that majority (88.03%) of the respondents are completely preferred and gave first rank for 'Talor and Francis' followed by Annual Reviews ($2^{nd}$ rank), $3^{rd}$ rank for American Chemical Society, American Physical Society ($4^{th}$ rank), Jstor ($5^{th}$ rank), Oxford University Press ($6^{th}$ rank), Project Muse ($7^{th}$ rank) and American Institute of Physics ($8^{th}$ rank). They assigned $9^{th}$ rank for Spinger Link. That means majority of the faculty preferred the usage of E-Journal 'Taylor and Francis'.

**Table 9: Purpose of seeking information by the respondents**

| Purpose of seeking information | Faculty (N=40) | Research Scholars (N=219) | Total (N=259) |
|---|---|---|---|
| For Teaching purpose | 7(17.50%) | 50(22.83%) | 57(22.01%) |
| For Research purpose | 18(45.00%) | 102(46.58%) | 120(46.33%) |
| For Learning Purpose | 9(22.50%) | 52(23.74%) | 61(23.55%) |
| For various academic purposes | 6(15.00%) | 15(6.85%) | 21(8.11%) |

The Table 9 reflect that majority (45.00%) of the faculty and 46.58 percent of research scholars seeks information 'for research purpose'. 17.50 of faculty and 22.83 percent of research scholars seeks information 'for teaching purpose', whereas 8.11 percent of total respondents seeks information from E-ShodhSindhu 'for various academic purposes'.

**Table 10: Frequency of facing difficulties while accessing E-ShodhSindhu resources**

| Frequency | Faculty (N=40) | Research Scholars (N=219) | Total (N=259) |
|---|---|---|---|
| Rarely | 12(30.00%) | 75(34.25%) | 87(33.59%) |
| Frequently | 21(52.50%) | 108(49.32%) | 129(49.81%) |
| Most frequently | 7(17.50%) | 36(16.44%) | 43(16.60%) |

It is obvious from Table 10 that 49.81 percent of total respondents faced difficulties 'frequently' while accessing E-ShodhSindhu followed by 33.59 percent respondents faced 'rarely' and 16.64 percent of total respondents faced difficulties 'most frequently' while accessing E-ShodhSindhu resources.

**Table 11: Activities to maximize the usage of E-ShodhSindhu resources**

| Activity chosen | Faculty (N=40) | Research Scholars(N=219) | Total (N=259) |
|---|---|---|---|
| Conducting orientation programs | 8(20.00%) | 53(24.20%) | 61(23.55%) |
| Conducting workshops | 7(17.50%) | 42(19.18%) | 49(18.92%) |
| Conducting seminars | 6(15.00%) | 21(9.59%) | 27(10.42%) |
| Conducting awareness programmes | 9(22.50%) | 34(15.53%) | 43(16.60%) |
| Conducting trainings frequently | 10(25.00%) | 69(31.51%) | 79(30.50%) |

Table 11 reflect that majority (30.50%) of the total respondents expressed that 'conducting trainings frequently' will maximize the usage of E-ShodhSindhu resources. 23.55 percent of the respondents opined that 'conducting orientation programmes', 18.92 percent expressed 'conducting workshops', 16.60 percent opined 'conducting awareness programmes' and only 10.42 percent of the total respondents expressed that 'conducting seminars' will maximize the usage of e-ShodhSindhu resources.

**Table 12: Level of satisfaction with existing E-ShodhSindhu resources**

| Level of Satisfaction | Faculty (N=40) | Research Scholars (N=219) | Total (N=259) |
|---|---|---|---|
| Very satisfied | 12(30.00%) | 78(35.62%) | 90(34.75%) |
| Satisfied | 9(22.50%) | 63(28.77%) | 72(27.80%) |
| Neutral | 9(22.50%) | 35(15.98%) | 44(17.00%) |
| Not satisfied | 10(25.00%) | 43(19.63%) | 53(20.45%) |

It is observed from the Table 12 that 34.75% of the respondents which constituted 30.00% of the Faculty members and 35.62% of the Research Scholars are 'Very Satisfied' with existing e-ShodhSindhu resources. Followed by 27.80% of the respondents which constituted 22.50% of the Faculty members and 28.77% of the Research Scholars are 'satisfied'. Moreover, 20.45% of the respondents

which constituted 25.00% of the Faculty members and 19.63% of the Research Scholars are 'not satisfied'. Only 17.00% of the total respondents are "Neutral" with the existing e-ShodhSindhu resources. Overall analysis depict that majority of the respondents were 'Very satisfied' with the existing e-ShodhSindhu resources.

## Major findings of the Study

- Among 259 Andhra University library users there are 69.88% male candidates and 30.12% female candidates. There are 15.4% Faculty members and 84.6% Research Scholars in total respondents.
- Majority of the total respondents (54.83%) belonged to Science subjects whereas 45.17 percent of respondents belonged to Social Sciences.
- Majority (42.00%) of faculty belonged to the age group of above 50 years whereas majority of the Research Scholars (47.94%) belonged to the age group of between 20-30 years.
- It is observed that majority 67.95% of the respondents which constituted 50.00% of the Faculty and 71.23% of the Research Scholars were 'very much' aware of e-ShodhSindhu Library consortium.
- Majority 57.14% of the total respondents came to know about e-ShodhSindhu from their Teachers and only 6.18% of the respondents came to know about e-ShodhSindhu from their 'any other' source.
- Among 259 respondents majority of the respondents (42.08%) visited e-ShodhSindhu once in a week '2-3 times in a month' followed by 23.55 percent of respondents visited '2-3 times in a week'.
- Majority of (50.58%) of total respondents constituting 40.00 percent of Faculty and 52.51 percent of research scholars spent 'less than one hour' daily in E-ShodhSindhu and only 3.47 percent of total respondents spent 'more than 3 hours' in E-ShodhSindhu resources.
- Majority (88.03%) of the respondents are completely preferred and gave first rank for 'Talor and Francis' followed by Annual Reviews ($2^{nd}$ rank) and $3^{rd}$ rank for American Chemical Society among the nine e-journals which are available in Andhra University library.
- Majority (45.00%) of the faculty and 46.58 percent of research scholars seeks information 'for research purpose' and 17.50 of faculty and 22.83 percent of research scholars seeks information 'for teaching purpose'.

- Majority (49.81%) of total respondents faced difficulties 'frequently' while accessing E-ShodhSindhu followed by 33.59 percent respondents faced 'rarely' and 16.64 percent of total respondents faced difficulties 'most frequently' while accessing E-ShodhSindhu resources.
- Majority (54.05%) of the total respondents expressed that 'conducting trainings frequently' and 'conducting orientation programmes' will maximize the usage of E-ShodhSindhu resources.
- Majority (34.75%) of the total users are 'very satisfied', followed by 28.80% of the users 'satisfied' and 20.45 percent are 'not satisfied' with the existing e-ShodhSindhu resources

## Conclusion

Current trends in the electronic environment point to a total change in the state of collection development. As information technology (IT) progresses, academic libraries' attention has shifted to the intrinsic excellence of collection development appropriate for electronic resources. According to the current study, a considerable number of users have begun utilising electronic journals as a result of E-ShodhSindhu. In comparison to the home and hostel, users access e-resources more from the departmental library and university library. Because information is widely accessible to people via the internet, the use of print publications has decreased. Users' goals and preferences should be considered while selecting e-resources for the library. The library should give facilities for users to become familiar with the library's e-resources subscriptions; this can be done in a variety of ways. For optimum usage of E-ShodhSindhu e-resources, special training programmes for students should be created so that users may appropriately trace relevant information. Also, there's a lot of variety of journals demanded to feature in e-ShodhSindhu Digital Library Consortium. Library professionals ought to conduct user education programmes, awareness programmes, workshops, etc, and take a lot of actions to achieve the expectations of the respondents.

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# A Novel Solution For Information Access And Utilization Of Open Educational Resources (OER) In The Acadamic Environment Particularly In Rural Areas Of World

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## ABSTRACT

*Now a days Open Educational resources are very crucial for the academic, Research, Teaching, Long distance Education, etc., fields. This open educational resources comprising of e-journals, e-books, e-news, digital materials etc., these all are open sources available to open world even though it is available in the free world there are certain portion of people, particularly people from rural areas who are unable to use the resources because of some problems. In this paper I will explore the issues, challenges and solutions in accessing the information access and open educational resources as well as opportunities in open educational resources academic field.*

***KEY WORDS:*** *Democratic, e-journals, learning , public-domain, resources, scientific.*

## INTRODUCTION

Open Educational Resources (OER) are teaching, learning and research materials in any medium – digital or otherwise – that reside in the public domain or have been released under an open license that permits no-cost access, use, adaptation and redistribution by others with no or limited restrictions. OER supports the democratic version of knowledge sharing, means it doesn't discriminate on the basis of caste, creed, sex and age etc. countries like India &China with vast population facing the scarcity of the resources. Open educational resources have received increased attention for their potential to obviate demographic, economic and geographic educational boundaries and to promote lifelong learning and personalized learning. As information technologies have become more readily available, those involved in education have found that a vast number of digital resources are available from many sources. Many teachers are using the Internet in their courses and thus the amount of course content available in digital format is growing.

Types of OER include (but are not limited to) syllabi, lesson plans, learning modules, lab experiments, simulations, course videos, discussion prompts, assignments, assessments, library guides and course design.Many faculty already use OER in their classes – showing YouTube videos, using worksheets created and shared by other faculty, and using online simulations as learning activities. Faculty can create and share syllabi, lesson plans, and even full textbooks for their courses. Students can play a significant role in creating OER as well – from simple assignments to full textbooks. As an example, at Plymouth State University, students worked together to find public-domain materials, write topic introductions, craft discussion forum prompts, and create assignments to go along with the materials to create a full OER.Instructional Designers can work with faculty and students to integrate OER into teaching, learning and can also share and publish their course design templates as OER. Many instructional designers and technologists work with librarians and IT services to help integrate OER into learning management systems and other course learning platforms.

Librarians play a key role in OER initiatives – advocating, developing, exploring, and managing OER. Along with helping you find OER, librarians can help you better understand copyright and licensing concepts, and guide you through your Creative Commons licensing options if you choose to create materials yourself.

The context of UNESCO's aim to provide free access to educational resources on a global scale. The term was first adopted by UNESCO in 2002 in the final report of the Forum on the Impact of Open Courseware for Higher Education in Developing Countries, to refer to "the open provision of educational resources, enabled by information and communication technologies, for consultation, use and adaptation by a community of users for non-commercial purposes". (UNESCO 2002).

## UTILIZATION OF OPEN EDUCATIONAL RESOURCES IN ACADAMIC ENVIRONMENT

Growth of internet offers real opportunities for improving Access information from universities and colleges to a wide range of users. OER is not the substitute of the traditional institutional based learning but it can be added advantages for the supplementing the institution based learning to same extent it can benefit to them also who due to lack of time or money are not able to join the educational institutes on a regular basis and also it helps to the distance education students .United Human Rights forum stated that everyone has the right to education ,education shall be free, at least in the elementary and fundamental stage.

Covidpandemic happening from Dec-2019. Due to this almost total world went to lockdown. This causes serious impact on Academic environment particularly

primary, secondary and higher secondary schooling.Every student stayed at home and no one expected that world will mount towards online learning from physical learning.

As the use of OER becomes more widespread, we have access to more repositories where you can search for OER. Keep in mind that while you may not find OER that perfectly suit your needs, most OER can be modified and customized to fit within the context of your course, or meet the needs of your students. Yes, that takes time and consideration, but that time and consideration can greatly benefit your own teaching and research, as well as the overall learning experience that your students have.

## ADVANTAGES OF OPEN EDUCATIONAL RESOURCES:

Free sharing means broader and faster dissemination and thereby more people are involved in problem solving which in turn means rapid quality improvements and faster technical and scientific development decentralized development increases quality, stability and security. Free sharing of software, scientific results and educational resources reinforces social development and diminishes social inequality.

## THE OPEN EDUCATIONAL RESOURCES MOVEMENT IN INDIA:

As India marches rapidly towards an ambitious agenda of economic and social advancement, one of the greatest challenges it faces is to provide extensive access to quality higher education opportunities. An evident and expanding Open Education Resources movement offers great promise for meeting this challenge through initiatives that make quality tools, content and practice widely available. Accordingly, India's National Knowledge Commission launched a process to explore and leverage these initiatives for adoption and adaptation, as well as to serve as a model for further indigenous efforts. In December 2005, the growing capabilities of the Internet, coupled with OER, offer unprecedented opportunities for significantly broadening access to quality educational resources for different sectors. Together they have the potential to permit globally created educational resources to serve the knowledge needs of diverse communities; they offer the possibility of bringing interactive educational experiences that have hitherto not been the norm to learners.

## DIFFERENT OPEN EDUCATIONAL RESOURCE PLATFORMS

### (I) MOOCS:

MOOCs stands for Massive Open Online Courses. These courses are free online courses available to any individual who would like to enroll. MOOCs offer a wide range of courses in many different subjects for individuals to be able to evolve their knowledge and education in an affordable and easy manner.

### (II) NPTEL:

When talking about the OER initiatives in India, the name of NPTEL comes first. The National Program on Technology Enhanced Learning (NPTEL) was initiated by seven Indian Institutes of Technology (Bombay, Delhi, Kanpur, Kharagpur, Madras, Guwahati and Roorkee) along with the Indian Institute of Science, Bangalore in 2003. The project has been funded by the Ministry of Human Resource Development, Government of India. It is the largest online repository in the world of courses in engineering, basic sciences and selected humanities and social sciences subjects. These courses are open for anyone to access – at no cost. So anyone interested in learning gets access to quality content, which also includes a discussion with the content creator and access to assignments for self-testing.

### (III) SWAYAM:

SWAYAM is a program initiated by the Government of India and designed to achieve the three cardinal principles of Education Policy viz., access, equity and quality. The objective of this effort is to take the best teaching-learning resources to all, including the most disadvantaged. SWAYAM seeks to bridge the digital divide for students who have hitherto remained untouched by the digital revolution and have not been able to join the mainstream of the knowledge economy. This is done through a platform that facilitates hosting of all the courses, taught in classrooms from Class nine till post-graduation to be accessed by anyone, anywhere at any time.

### (IV) IGNOU'S E-GYANKOSH:

Indira Gandhi National Open University is the largest Open University in India, providing education to its learners through the open mode of learning. EGYANKOSH is an archive of various text study material of all the courses run by it, which are freely available to all. And its YouTube video also provides a range of Open Educational Videos recorded at the IGNOU studio for GyanDarshan educational channels.

**(V) SHODGANGA:**

The Shodhganga@INFLIBNET Centre provides a platform for research students to deposit their Ph.D. theses and make it available to the entire scholarly community in open access.

**(VI) SAKSHAT:**

Is envisaged as one-stop education portal to facilitate lifelong learning of the students, teachers and those in employment or in pursuit of knowledge free of cost to them. The portal is expected to be the main delivery platform for the contents developed under the National Mission on Education through ICT (NMEICT). Sakshat integrates all the contents developed under the Mission and also provides Mission related information and to facilitate public scrutiny, feedback and transparency for the projects undertaken by the Mission.

**(VII) SWAYAM PRABHA:**

The SWAYAM PRABHA is a group of 32 DTH channels devoted to telecasting of high-quality educational programs on 24X7 basis using the GSAT-15 satellite. Every day, there will be new content for at least (4) hours which would be repeated five more times in a day, allowing the students to choose the time of their convenience. The contents are provided by NPTEL, IITs, UGC, CEC, IGNOU, NCERT and NIOS. The INFLIBNET Centre maintains the web portal.

**(VIII) CORSORTIUM FOR EDUCATIONAL COMMUNICATION:**

The Consortium for Educational Communication popularly known as CEC is one of the Inter University Centers set up by the University Grants Commission of India. It has been established with the goal of addressing the needs of Higher Education through the use of powerful medium of Television along with the appropriate use of emerging Information Communication Technology (ICT).

**(IX) PG PATHSALA:**

Is the gateway to all the postgraduate courses, it is an initiative of the MHRD under its National Mission on Education through ICT (NME-ICT) being executed by the UGC. The content and its quality being the key component of education system, high quality, curriculum-based, interactive e-content in 70 subjects across all disciplines of social sciences, arts, fine arts and humanities, natural & mathematical sciences.

**(X) NATIONAL DIGITAL LIBRARY OF INDIA:**

Ministry of Human Resource Development (MHRD) under its National Mission on Education through Information and Communication Technology (NMEICT) has initiated the National Digital Library of India (NDL India) pilot project to develop a framework of virtual repository of learning resources with a single-window search facility. Filtered and federated searching is employed to facilitate focused searching so that learners can find out the right resource with least effort and in minimum time. NDL India is designed to hold content of any language and provides interface support for leading Indian languages. It is being arranged to provide support for all academic levels including researchers and life-long learners, all (xi) disciplines, all popular form of access devices and differently-abled learners.

**(XI) NATIONAL REPOSITORY OF OPEN EDUCATIONAL RESOURCES:**

Initiated by the Department of School Education and Literacy, Ministry of Human Resource Development, Government of India and managed by the Central Institute of Educational Technology, National Council of Educational Research and Training, the Repository runs on the MetaStudio platform, an initiative of the Knowledge Labs, HomiBhabha Centre for Science Education.

**(XII) NCERT:**

National Council of Educational Research and Training (NCERT) is the autonomous organization set by Government of India to assist and advise the central as well as state governments regarding the school education, it also publishes the model school textbooks and is playing other related roles to make the quality school education possible in India.

**(XIII) NKN:**

National Knowledge Network (NKN) project is aimed at establishing a strong and robust Indian network globally, frontier research and innovation are shifting towards multidisciplinary and collaborative paradigm and require substantial communication and computational power. In India, NKN with its multi-gigabit capability aims to connect all universities, research institutions, libraries, laboratories, healthcare and agricultural institutions across the country to address such paradigm shift.

## ISSUES AND CHALLENGES IN OER UTILIZATION PERTICULARLY IN RURAL AREAS:

Main challenges of OER are intellectual property, The Digital divide and sustainability.Intellectual property is the property made after applying one's intellect as writings , art and music often come under copyright mean to control the right to copy .While publication, consumption and distribution of texts were mediated through physical media, academics remained for the most part unaware of the licensing that underpinned the exploitation of copyright. Internet and other digital media have changed this. Many countries still have the low connectivity of the internet & in India many places facing the low bandwidth of internet issue.

The overview of the current state of OER showed that a growing number of initiatives and digital resources are available. Teachers, students and self-learners looking for resources should not have difficulties finding resources, but still might have problems of judging their quality and relevance. The issue of the quality of resources is fundamental and cannot be dealt with at depth in this paper. Instead a few different approaches to the issue of quality management will be listed.There is a need to define the technical and legal frameworks as well as business models to sustain these initiatives.

## ROLE OF OPEN EDUCATIONAL RESOURCES IN THE NATION DEVELOPMENT

OER Directly makes influence on unemployment issue which is the main issue facing in the world. OER directly makes impact on increasing the educational standards people. Average years of education is a major thing in Human development index calculation which gives the rankings for the nations in the world. Presently India is in the 130$^{th}$position.by increasing of OER opportunities it will defiantly helps to increase the rating in HDI rankings.Generally for using of this OER we need Electronics Devices Like Mobile phone,Tablet,Personal computer,projector,laptop,storage devices etc. these all are comes under electronics category which is a better sign for the nation like India to get use of this situation and get development of the nation and provide employment opportunities in electronics field.

## SOLUTION FOR PROBLEMS FACING IN UTILIZATION OF OER IN RURAL AREAS

Each and Every Rural area in India comes under a panchayat. And panchayat every year collects house tax .in that house tax document there is a field of tax for library service.

**i.** Almost all panchayat has libraries which are not utilizing properly by the governments for providing pen education facilities to public .for the utilization of this library service properly I am proposing solution that along with newspapersand books governments will provide computer with internet facility and awareness about the utilization of resources through internet medium to the public there will be a great change we can expect in future in total India.

**ii.** In the early years of 2000 India doesn't have the cellular technology spread in all parts of the country. Only few rich people had mobile phone in that days. That days people were used the coin box facility & public telephones to use cellular service i.e. voice calling. Similarly India is also a developing country and in this country everyone doesn't have the medium facility to use OER freely by their own for this issue I am suggesting that open free internet cafes with full access to all educational resources.

## CONCLUSION

With using this methods there are lot of benefits will happen for the nation like, directly improve the standards of the people, increase the innovations for better life, increase the job opportunities, reduce the poverty, gives the better solution to the wrong practices which are still believing in the public, increase the human development index value of the country &increase the jobs in electronics, software, marketing, industries.

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# Knowledge for Free: Open Educational Resources Initiatives in Indian Higher Education System

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## Abstract

*This paper traces and explains open educational resources (OER) in the higher education system of India. Higher educational bodies provide financial support to develop required information systems to promote and disseminate knowledge over the web free of cost to build a knowledge base society through digital learning. The OERs platforms like NPTEL, IGNOU, E-PG Pathshala, SWAYAM and many are available for free of cost. The objective of the study is to provide information on Open Knowledge resources that are available without any restriction for access.*

**Keywords:** *Virtual learning, OER, MOOCs, Digital Library, Open Access, ICT*

## 1. Introduction

In India evolution of higher education is a trace from ancient Nalanda university. The $10^{th}$ and $11^{th}$ five-year plans give a boost to develop IITs, Universities, Research centres across the country. ICT become a boon for information and knowledge centres for providing information services. Due to the development of ICT, the library and information centres starts to promote electronic educational resources among the user community through digital libraries. The higher educational bodies like IITs, IISc, AICTE, IGNOU, MHRD, NPTEL and some non-profit organizations enables a free flow of information in electronic format using free platforms. Open educational resources play a vital role in disseminating information to users at the pandemic time. This paper explains the major open educational resources are developed in India.

## 2. Open Educational Resources

**"**OER are those teaching, learning and research digital format materials that are available to public domain released under the open license it allows users to use the content without any restrictions to support learning and knowledge sharing. (https://plus.google.com/+UNESCO, 2017)"

"OER are digitized materials offered online for free of cost to educators, self-learners, students and researchers. They include learning content, software tools to develop, use and distribute resources under open licenses which helps in an academic environment. The online web portals consist of E-Textbooks, E-Journals, online tutorials, live classes, recorded lectures, reference video materials, self-assignments, FAQ, multimedia apps. ("Open Educational Resources," 2022)

## 3. OER Initiatives in Indian higher education

The word `open educational resources` was used first at UNESCO's "Forum on the Impact of Open Course Ware for Higher Education in Developing Countries" in the year 2002. The Indian government through the national knowledge commission enhance the quality of education and access to it under digital innovations. Today Indian higher education bodies show more interest in using OERs and in pandemic most organisations in India showcase the importance of OERs to their student community. The major OER initiatives by the Indian government are explained below:

- **E-PG Pathshala:** It is the Gateway for all Post Graduation Degree programs in India with an initiative of MHRD and it was developed and maintained by INFLIBNET it provides e-content to 70 subjects that covers basic sciences, social sciences and engineering. The content in the portal was developed by experts working in the Indian education industry. The web port includes E-textbooks, journals, audio and video kind of materials and it strongly advocates UGC MOOCs (*E-PGPathshala*, n.d.)
  (URL: https://epgp.inflibnet.ac.in/Home/Download).

- **NDLI:** National Digital Library of India launched with the motto of "One Library All of India" under the National Mission Project of MHRD in May 2016 under a pilot project. On June 19th 2018 project was decided for the nation and it was managed by IIT Kharagpur to enhance digital literacy. It hosts materials like web courses, research articles, question papers, monographs, books, technical reports and reports related to law judgements, agriculture and science and technology. as of April 2019, more than 4.5 crore items are hosted in NDLI. NDL has collaborated with NCERT, NPTEL, INFLIBNET, KRISHIKOSH, LIBRIVOX, Shodhaganga, EGyankosh etc("National Digital Library of India," 2022).
  (URL: https://ndl.iitkgp.ac.in/)

- **NPTEL:** National Programme on Technology Enhanced learning funded by MHRD. Online learning Platform offers university-level subjects under

science, technology, engineering and mathematics. It was functioning from IIT Madras since 2003. It was coordinated with seven IITs and IISc Bangalore. From March 2014 it started offering online certificate courses/MOOCs under UGC credit guidelines to those who clear course completely. And it offers more than 2300 unique courses and it host content on YouTube with more than 37laks subscribers. NPTEL initiatives Faculty Development Programme for approved institutions recommended by AICTE ("National Programme on Technology Enhanced Learning," 2021). (URL: https://nptel.ac.in/)

- **NROER**: National Repository of Open Educational Resources is another project of OER launched in Aug 2013 by the Government of India with a collaborative effort of Central Institute on Educational Technology brings under consortium on the interest of every educational institution across the country. The repository consists of resources various documents in the form of periodicals, digital books multimedia resources research articles to support the school and higher education("National Repository of Open Educational Resources," 2020).
(URL:https://www.education.gov.in/en/national-repository-open-educational-resources)

- **SWAYAM:** Study Webs of Active Learning for Young Aspiring Minds is an Indian Massive open online courses platform (MOOCs) program of MHRD. It was developed by faculties and professors from reputed institutions. If offers 2748 online courses from class 9$^{th}$ to post-graduation level. The learning content was developed by nine coordination institutions and the courses are delivered through the swayam platform the content is delivered in videos, reading materials, assignments and discussion forums. And UGC provides credits for online learning courses("SWAYAM," 2021).
(URL: https://swayam.gov.in/)

- **Sakshat**: This portal contains e-learning content that addresses childhood education to PhD it was developed through the National Mission on Education and launched on 30 October 2006(*Department of Higher Education | Government of India, Ministry of Education*, n.d.).
(URL: https://sakshat.ac.in/)

- **Gyan Vani**: Radio Gyan Vani is an online educational FM Radio Station of India working in several Indian states the programmes are broadcasted by educational institutions of India("Gyan Vani," 2022).
  (URL: https://onlineradiofm.in/stations/gyan-vani)

- **OSCAR**: Open Source Courseware Animation Repository this project was initiated by professors of IIT Bombay Sridhar Iyer, professor Shana Murthy and Vijayalaxmi in 2001 funded by MHRD. The repository was built over the aim of a large repository of web-based interactive animations with creative commons attributions for non-commercial use among science and technology-based concepts(*OSCAR Main Page*, n.d.).
  (URL: http://oscar.iitb.ac.in/aboutOscar.do)

- **IGNOU Virtual Classroom**: IGNOU started providing virtual education in India to provide sustainability development programmes for faculty and staff of higher education and it developed courseware e-content for learners in various formats (*Virtual Class*, n.d.).
  (URL: http://www.ignouonline.ac.in/VirtualClass.htm)

- **IGNOU:** Indira Gandhi National Open University is a central open learning university established by the act of parliament in 1985. For the past 37 years, it striving to build a knowledge society by providing open distance learning in India with the highest NAAC grade of A++ with 67 regional centres across the country. It also offers a special course for specially-abled people with the name "Sugamya Pustakalaya"("Indira Gandhi National Open University," 2022).
  (URL: http://ignou.ac.in/)

- **Consortium for Educational Communication (CEC):** It is a university set up by UGC its primary objective is to address the needs in higher education using Television as a medium with the use of ICT it provides educational programmes in different subjects(*About CEC | Consortium For Educational Communication*, n.d.).
  (URL: http://cec.nic.in/cec/)

**Issues and Challenges in OER**

- **Lack of Information retrieval techniques:** The usage of electronic devices in education growing exponentially but the users of the web don't have the

skill of search and retrieval of precision information required on the web with the decay of time users lose interest.

- **copyright and license issues:** it's a consent issue to share e-learning content over an open-access platform and it is most important to management to host the content without copyright and license violation.
- **Lack of IT Skills**: higher educational institutes facing skilled IT human sources and Information technology domain is growing rapidly with parallel to those educational institutions train the students and faculties through workshop and orientation classes.
- **Lack of IT infrastructures:** Many institutions are behind in set-up a better IT infrastructure due to many reasons.

## Challenges

- **Quality of information assurance:** with the exponential growth of OERs institutions and students are facing a choice of relevant resources.
- **Long term sustainability issue**: a gradual diminishing in funding leads and raise of sustainability of OER and Maintenance of OERs.
- **Lack of awareness on copyright:** copyright play a vital role in publishing content online for free if not it comes under law.
- **Lack of communication in education:** Education oriented towards student-centric OERs leads gap between teacher and students communication.

## Conclusion

OER plays a vital role in driving the higher education system in India through digital innovations. Pandemic set a path for future of education system globally and it shows an OERs importance in the education to promote sustainability in education in hard times situations like a pandemic. It's a time to think of OERs and promoting of OERs to create a future knowledge society of India by developing high-quality collections in all disciplines.

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# OER (Open Educational Resources) in the Academic Environment: Opportunities and Challenges

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**Abstract**

*Open Educational Resources (OERs) are any type of educational materials that are in the public domain or introduced with an open license. The nature of these open materials means that anyone can legally and freely copy and use. The paper discusses the number of examples in OER like SWAYAM, Swayam Prabha, Shodhganga, NDLI, E-yantra etc. with their features. The paper also discusses opportunities and the challenges of OER and National Educational policy, 2020 vision towards OER.*

***Keywords:*** *Open Educational Resources, SWAYAM, Swayam Prabha, NDLI, Shodhganga, National Education Policy-2020.*

## INTRODUCTION

In the information society, data is available both in printed and electronic form.With the emergence and extensive use of digital technologies, many learning resources are available on the Internet/online (public domain) and can be accessed via digital devices like computer, mobile phone and iPod, etc. These educational resources that are available in the public domain are known as Open Educational Resources (OERs).Open Educational Resources (OERs) are any type of educational materials that are in the public domain or introduced with an open license. The nature of these open materials means that anyone can legally and freely copy and use. Generally,OERs refer to online materials that can be adapted, reused, shared and even used for commercial purpose. Thus, OERs are reusable teaching-learning materials. OERs can be as short as small text, audio, video, image files, etc. as well as big files like textbooks or whole courses.

## Examples of OER

## NATIONAL REPOSITORY OF OPEN EDUCATIONAL RESOURCES (NROER)

National Repository of Open Educational Resources (NROER) by Ministry of Education offers resources for all school subjects and grades in multiple languages. One can access educational videos, audios, images, documents and interactive modules. The objectives of this repository include improving the quality of teaching-learning, helping teachers to create and share the resources. Its mission is to enable the participation of the community in the development and sharing of digital resources.

## SWAYAM

SWAYAM is India's unique Massive Open Online Courses (MOOC) platform, offering online courses in all disciplines. Engineering, Law, Business Administration, Humanities, Social sciences, specialized courses. Developed to achieve the three basic principles of access to education policy, fairness and quality. It is an indigenously advanced Cloud primarily based totally IT platform that enablesweb website hosting of all of theguides, taught in school rooms from ninthto Post-Graduation to be accessed with the aid of using anyone, anywhere. All the guides are interactive, organizedwith the aid of using reputed instructorswhich can be accessed through computers / cellular phones. The courses available in SWAYAM are free, but any learner wants a certificate should register for the final proctored exams with minimal fee and need s to attend in-person at the allotted centres on specific dates. Eligibility for the certificate will be announced on the course page and learners will get certificates only if these criteria are matched. Universities/colleges approving credit transfer for these courses can use the marks/certificate obtained in these courses for the same.

## SWAYAM PRABHA

SWAYAM PRABHA is a group of 22 DTH channels aimed at broadcasting high quality educational programs 24/7 using the GSAT15 satellite. There will be at least (4) hours of new content each day, which will be repeated 5 more times a day, allowing students to choose the time of their choice. Channel is uplink from BISAGN, Gandhinagar. Content is provided by NPTEL, IIT, UGC, CEC and IGNOU. The INFLIBNET Center manages the web portal. The DTH channel covers university curriculum-based course content at the graduate and undergraduate levels in a variety of disciplines including arts, science, commerce, performing arts, social sciences and humanities, engineering, technology, law, medicine, and agriculture.. Curriculum-based courses also offered which meet the

needs of lifelong learners of Indian as well as International Indian citizens, and help students (11th and 12th grades) for competitive exams.

## NATIONAL DIGITAL LIBRARY OF INDIA

NDL India is sponsored and mentored by Ministry of Education, Government of India, through National Mission on Education through NMEICT and provides a framework for virtual repositories of learning resources with a single window search function. 24x7 learning resource. Anyone can access it from anywhere at any time. Over 3.8 million eBooks / journals / audio books / survey content is available in over 200 languages. It aids researchers, life-long learners and differently-able persons and students who are preparing for entrances and competitive examinations. It is developed, operated and maintained from Indian Institute of Technology, kharagpur.

## E-Yantra

It enables effective education with embedded systems and robotics across Indian engineering colleges. Training for teachers and students can be transmitted by the workshop where the participants teach the basics of embedded systems and programming. Teachers and student commitments in practical training using challenging competition are another innovative way to depict. It also helps a university to establish a robot engineering lab / club to make it part of a daily routine training curriculum. In this initiative, more than 275 universities benefit from all over India. All projects and code are available as open source content on the Yantra website at www.eyantra.org.

## FOSSEE

FOSSEE recommends the use of open source software at educational institutions (http://fossee.in). This is done through materials such as audio tutorials. Documents such as Textbook companions, awareness programs, training workshops, internships etc.The Textbook Companion (TBC) is a collection of resolved example codes for standard textbooks.

## EPGP

EPG Pathshala is an initiative of MHRD as part of UGC's National Mission on Education through ICT (NMEICT). Content and its quality are key elements of the education system, with 70 high-quality, curriculum-based interactive electronics in all areas of social sciences, arts, art and humanities, science and mathematics, linguistics and language. The content was developed by subject matter experts working at Indian universities and other R & D institutions across the country. Each

subject had a team of principal investigators, work coordinators, content writers, content reviewers, language editors, and a multimedia team.

## SHODHGANGA: A RESERVOIR OF INDIAN THESES

Theses and papers are rich and unique sources of information. Theses and papers are undeveloped and underutilized products that lead to unnecessary duplication and repetition. This is, in fact, the exact opposite of wasting research and huge human and financial resources. Online availability of electronic papers through a centralized digital repository not only guarantees easy access and archiving of Indian papers, but also helps improve the level and quality of research. It provides a platform for research scholars to deposit their PhD theses and make it available to the entire scholarly community in open access. The repository has the ability to capture, index, store, disseminate and preserve ETDs (Electronic Theses and Dissertations) submitted by the researchers from different Indian universities.

## E-SHODHSINDHU

Based on the recommendations of the Expert Committee, the Ministry of HRD (now renamed the Ministry of Education) established eShodh Sindhu to bring together three consortium initiatives: the UGCINFONET Digital Library Consortium, the NLIST, and the INDESTAICTE Consortium. eShodh Sindhu has over 10,000 core and peer-reviewed journals, as well as both current and archive access to various bibliographic, citation, and fact databases in a variety of disciplines, from numerous publishers and aggregators to their member institutions, including central funds. The main goal of the Consortia for Higher Education Resources is to provide academic institutions with access to high-quality electronic resources such as full-text, bibliographic and fact-based databases at lower subscription fees. Its objectives are to develop a formidable collection of e-journals, e-journal archives and e-books on perpetual access basis; to monitor and promote usage of e-resources in member universities, colleges and technical institutions in India through awareness and training programmes; to provide access to subscription-based scholarly information (e-books and e-journals) to all educational institutions; to provide access to scholarly content available in open access through subject portals and subject gateways and move towards developing a National Electronic Library with electronic journals and electronic books as its major building blocks.

## SHODHSHUDDHI

Based on the recommendations of a subcommittee of eShodhSindhu, the Ministry of Education and the Government's National Steering Committee (NSC) of India has launched a program "Shodh Shuddhi" that provides access to

plagiarism detection software (PDS) to all universities / institutions in India to 1000 institutions. As part of this initiative, Ouriginal (formerly Urkund), a web-based plagiarism detection software system, will be available to users at all universities / institutions in the country. This initiative was officially launched by the former Minister of Education (formerly MHRD) on September 21, 2019.

## SPOKEN TUTORIAL

Spoken Tutorial is an award-winning educational content portal. One can learn a variety of free and open source software. The self-study multilingual courses allow anyone with a passion to learn in their favourite language anytime, anywhere. The course is simple and easy to understand even for beginners, but it also meets the growing needs of learners. Attractive digital content ensures that learning is done at all levels of basic, intermediate and advanced. Content requires parallel practice. This allows learners to actively learn. Much of the software taught is used in various disciplines of engineering, pure science, and several other undergraduate and graduate programs, and can also be extended to commercial, arts, and management streams. There are also school-related courses that help students visualize difficult mathematical and scientific concepts. These can also be used by teachers to plan lessons, explain abstract concepts, and give students digital assignments. EndofCourse online tests and certificates are available for those who want to test their specific software expertise. These certificates give students an edge during their internship by increasing their potential for employability.

## VIRTUAL LABS

Virtual Labs provide a fully interactive e simulation environment to perform experiments, collect data, and answer questions to assess the understanding of the knowledge acquired. In order to achieve the objectives of such an ambitious project, it is essential to develop virtual laboratories with stateoftheart computer simulation technology to create real world environments and problem handling capabilities. IIT Delhi as the Nodal Institute with other 10 institutes understands this initiative. It provides remote access to Labs in various disciplines of Science and Engineering Implemented by IIT Delhi, share costly equipment and resources, which are otherwise available to limited number of users due to constraints on time and geographical distances. Covers about 100 virtual labs. The Virtual Labs project is an initiative of the Ministry of Human Resources Development (MHRD) of India, supported by the National Mission on Education through Information and Communication Technology (NMEICT). This project is a consortium activity of 12 participating institutions and IIT Delhi is a coordinating body. This is a paradigm shift in ICT-based education. Such an initiative was first adopted in a remote experiment. As part of the Virtual Labs project, over 100 virtual labs consisting of

over 700 web-enabled experiments were designed for remote control and display. The beneficiaries covered by the project are, all science and engineering college students and faculty members who do not have access to excellent laboratory facilities and / or equipment. • High school students who are curious. This can be an incentive to pursue higher research. Various engineering departments that can benefit from content and related materials. Virtual labs do not require any additional infrastructure to run experiments as users. Simulation-based experiments can be accessed remotely via the internet.

## VIDWAN

VIDWAN is the main database of profiles of scholars / researchers and other faculty members working in major academic institutions and other R & D organizations involved in education and research in India. It provides important information about professional backgrounds, contacts, experiences, scholarly publications, skills and achievements, researcher identities and more. The database developed and maintained by the Information Library Network Center (INFLIBNET) is funded by the National Mission on Education. The database helps toselect a task force expert panel set up by various committees, ministries / governments. Institutions for monitoring and evaluation Make information about professionals available quickly and conveniently to colleagues, potential employees, funding agencies, policy makers, and research scientists in the country.

## IRINS

IRINS is a web-based research information management (RIM) service developed by the Information Library Network (INFLIBNET) Centre. This portal facilitates the collection, curation, and presentation of scientific communication activities by academic, R & D organizations, faculty, and scientists, and offers the potential to build scientific networks. IRINS is available as free software as a service to academic and R & D organizations in India. IRINS supports the integration of existing research management systems such as HR systems, course management, grant management systems, institutional repositories, open and commercial citation databases, and scholarly publishers. It is associated with academic IDs such as ORCID ID, Scopus, Research ID, Microsoft Academic ID, and Google Scholar ID, and you can read scholarly publications from a variety of sources.

## OPPORTUNITIES AND CHALLENGES IN THE USE OF OERS

The OER has created opportunities to change the practice of education and learning. New collaborative learning practices are emerging. Easy and free availability of high-quality materials makes it easy for educators to develop and

learn new educational models.Certain advantages of OERs in educational systems in developing countries include:

- helping developing countries save course content development time and money
- facilitating the sharing of knowledge
- addressing the digital divide by providing capacity-building resources for educators
- helping to preserve and disseminate indigenous knowledge, and
- improving educational quality at all levels

Despite the rapid growth of the OER moment and the benefits to learners, educators and institutions, there are still some pressing issues that need to be resolved for the OER to succeed. The development and use of OER itself faces major challenges. An OECD study (2007) shows certain barriers to the use of OER, which also applies to the Indian scenario. They are: Technical barriers include the lack of broadband access, economical barriers like insufficient resources to invest in the necessary hardware and software, Social Barrier like lack of skills required for use of technology, political barrier like a lack of clear policy in the organization associated with OER, legal barriers like time and effort associated with recovery of permission.

Intellectual property remains the biggest problem with OER in India. No content is available under a Creative Commons license to ensure copyright. In this highly competitive era, universities are looking for ways to protect their intellectual property for fear of it being stolen or used by others, and without copyright guarantees, these and papers is reluctant to share on public portals. Most of India's sub-urban and rural areas are still struggling to get enough electricity, and students in these areas are employed in facilities provided by ICT. A successful OER move requires a strong network-aware delivery infrastructure with an emphasis on access and delivery. There is still much ignorance in India about the availability of open educational resources and the opportunities they offer in the educator and learner community. Libraries and librarians need to continue to be involved in OER-related work.

## NATIONAL EDUCATIONAL POLICY 2020

NEP 2020's vision is to build an education system rooted in the spirit of India that directly contributes to making India a global knowledge superpower. All features are:

• All higher education institutions have basic infrastructure and facilities such as clean drinking water, clean toilets, blackboards, offices, teaching materials, libraries, laboratories, comfortable classrooms and campuses.

• All classrooms need access to the latest educational technologies that enable a better learning experience

• Teachers are given the freedom to develop their own curriculum and pedagogical approach within an approved framework.

NEP principles also encourage teachers and parents to raise awareness and encouragement of each student's overall development and full use of teaching and learning skills through utilising Open Educational Resources.

## CONCLUSION

Today's academic world requires creativity and innovation from all of us. A culture of lifelong learning is needed to enable all to succeed in a rapidly developing knowledge-based world. It has been observed that there is insufficient awareness between teachers and students. In addition, there was a slight contribution of teachers, created for Indian students.The MHRD in itsrecent directives encouraged the teachers anduniversities to create open e-contents and ecoursesusing government e-learning portalslike SWYAM, NPTEL, Diksha, e-pathShala,education repository such National Repositoryof Open Educational Resources (NROER)andNational Digital Library. As it is said that thenecessity is the mother of invention, theuniversity and college teachers are motivated tomake use of the initiatives of MHRD and theyare massively creating such e-resources. It is clear that the significant enhancement of such positive reactions from teachers during the pandemic makes them an unnamed `corona warrior`.

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# Reaping the Open Access Resources in Health Sciences

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## Abstract

*The paper presents an account of rapid growth of Open Access resources in the field of Science and technology especially in Health Sciences. States the definitions of Open Access resources and its importance in maintaining the well being of individuals and the society. Discusses the Salient Features, Advantages of OAR and detailed description of Select Open Access Resources in Health Sciences. Concludes that Librarians/information managers have to take a proactive role in exploiting OA resources to the optimum extent to serve better their user community.*

**Keywords**: *open access; open access resources; health sciences*;

## Introduction

An open access (OA), the product of Internet has also captured the global disciplines. Open access is a publishing model for scholarly communication that makes research information available to readers at no cost, as opposed to the traditional subscription model in which readers have access to scholarly information by paying a subscription. Open Access will have major impact on medical care and medical sciences. Open access resource is the buzz word/phrase that frequently find place not only in the literature of Library and Information Science but also in every discipline in this electronic era. Open access resources (OAR) is an important part of the user community by which students, research scholars, even faculties get solutions of their problems with just a click from their PCs. Health Science is also witnessing a dramatic growth in the open access

resources. In the era of print paper that was the merely model exist to enabled publishers to distribute journals and recover the cost.

## Definitions

Open access (OA) refers to freely available, digital, online information. Open access scholarly literature is free of charge and often carries less restrictive copyright and licensing barriers than traditionally published works, for both the users and the authors.Open Access resource as "the free availability on the public internet, permitting any users to read, download, copy, distribute, print, search, or link to the full texts of these articles, crawl them for indexing, pass them as data to software, or use them for any other lawful purpose, without financial, legal, or technical barriers other than those inseparable from gaining access to the internet itself".According to Gratis **'**Open access (OA) is information that is available free of charge, while some copyright and licensing restrictions may still apply'.According to Libre **'**Open access (OA) is information that is free of charge and free of most copyright and licensing restriction'.

## Salient Features of Open Access

- Open access literature is digital, free of charge and free of copy right
- Open access campaign focuses on the literature that authors give to the world without expectation of payment
- Open access literature is not free to produce or publish
- Open access is compatible with copyright, peer review, revenue, print, preservation, and prestige and career advancement

## Advantages of Open Access Resources

- Open Access acts as a boon to librarians, information seekers and also all the stake holders involved with OA resources.
- Easy access of institutional repositories and making the search easy
- Strengthens the research literature and helps in long term benefits
- Immediate access to literature with penny less expenditure
- Acts as boost to the developing countries
- Better return on investment for research sponsors
- Faster than traditional publishing
- Contributes to education's mission of advancing knowledge

## Open Access Resources in Health Sciences

**DOAJ (Directory of Open Access Journals** - ( http://www.doaj.org)

DOAJ (Directory of Open Access Journals) was launched in 2003 with 300 open access journals. It is a independent index contains almost 17,500 peer-reviewed, open access journals covering all areas of science & technology, medicine, social sciences, arts and humanities. It's aim is to increase the visibility, accessibility, reputation, usage and impact of quality, peer-reviewed, open access scholarly research journals globally, regardless of discipline, geography or language.

**BioMed Central** (http: //www. biomedcentral.com)

BioMed Central is a Scientific, Technical and medical publisher of 257 peer-reviewed open access journals. The portfolio of journals spans all areas of biology, biomedicine and medicine. All original research articles published by BioMed Central are made freely accessible online immediately upon publication. BioMed Central views open access to research as essential in order to ensure the rapid and efficient communication of research findings. It is an independent commercial publisher of open access biomedical journals. BioMed Central is owned by Springer Science and hosts the SpringerOpen platform.

**PubMed Central** (http://www.ncbi.nlm.nih.gov/pmc/index.html)

PubMed Central is a free full-text archive of biomedical and life sciences journal literature at the U.S. National Institutes of Health's National Library of Medicine (NIH/NLM). It serves as a digital counterpart to NLM's extensive print journal collection. It was developed and is managed by NLM's National Center for Biotechnology Information (NCBI). In 2000, PubMed Central was established from comprising two journals, Proceedings of the National Academy of Sciences and Molecular Biology of the Cell, to an archive of articles from thousands of journals. Now it contains 7.6 million full-text records, spanning several centuries of biomedical and life science research.

**Use of PubMed Central archive**

Use of PMC has increased as the archive has grown. Numbers reported below reflect access to the PMC website in the last month of each fiscal year (i.e., September).

| Fiscal Year | Articles Available | Avg. Unique Sessions/Weekday |
|---|---|---|
| FY21 | 7,383,455 | 3.1 million |
| FY20 | 6,471,176 | 3.4 million |
| FY19 | 5,725,819 | 2.6 million |
| FY18 | 5,107,590 | 2.4 million |
| FY17 | 4,553,343 | 2.1 million |
| FY16 | 4,054,283 | 1.3 million |
| FY15 | 3,623,566 | 1.2 million |
| FY14 | 3,227,379 | 886,000 |
| FY13 | 2,859,268 | 834,000 |

**PLoS (Public Library of Science -** http://www.plos.org)

PLoS (Public Library of Science) is a non-profit open access publisher empowering researchers to accelerate progress in science and medicine by leading a transformation in research communication. PLOS began in 2000 by founders Harold Varmus, Patrick Brown and Michael Eisen. In 2003 they launched their first fully Open Access journal in order to empower researchers to make science immediately and publicly available online. In 2020, PLOS partners with libraries to develop two new business models, Community Action Publishing and Flat Fees, which can significantly reduce or eliminate Open Access publication fees for PLOS authors.

**FreeBooks4Doctors (**http://www.freeBooks4doctors.com)

FreeBooks4Doctors was created to promote the free availability of medical books on the internet. Over the next years, many textbooks will be available online, free and in full-text. The unrestricted access to scientific knowledge will have a major impact on medical practice.

**Free Medical Journals (**http://www.freemedicaljournals.com)

Medical Journals will be available online, free and in full-text. The unrestricted access to scientific knowledge-the new standard in medical publishing-will have a major impact on medical practice.

**AMEDEO**: The Medical Literature Guide (http://www.amedeo.com)

AMEDEO has been created to serve the needs of healthcare professionals including physicians, nurses, pharmacists and administrators, other members of the health professions and patients and their friends. They can easily access timely, relevant information within their respective fields.

**Indian Medical Sites** (http://www.indianmedicalsites.in)

Its main aim is to make the resource the first choice for locating websites of Indian medical & healthcare entities / information resources. There are currently 3877 sites in the Directory and with simple and advanced searching facilities we will be able to find what we need effortlessly.

**Medknow Publications** (http://www.medknow.com)

Medknow Publications is a publisher for peer-reviewed, online/print Journals in the area of STM. Medknow Publications also known as Wolters Kluwer Medknow. It is the largest open access publisher on behalf of learned societies and associations. Medknow pioneers in 'free-less-free' model of open access publishing and provides immediate free access to the electronic editions of the journals majority of which do not charge the author or author's institution for submission, processing or publication of the articles.

**Science.gov (**http://www. science.gov)

Science.gov has been a model of voluntary interagency collaboration since its inception. It was launched in 2002. It is a gateway to U.S. government science information. Science.gov is becoming a federal public access portal consistent with its original purpose and current vision and goals. It is making available free journal articles, peer-reviewed accepted manuscripts, and reports of research funded by federal science agencies, as well as the agencies' public access policies and requirements.Science.gov makes it possible for users to search over 60 databases, over 2,200 websites, and over 200 million pages of authoritative federal science information in many formats, including full-text documents, citations, scientific data supporting federally funded research, and multimedia.

## Conclusion

Open Access movement, though started in the early 20$^{th}$ century, is now fast picking up and receiving global acceptance by various stake holders, such as,

institutions and organizations, authors of publications, information seekers/users and librarians over the world. Surveys have observed that the current scientific and technical information is now available as Open Access.

Open Access publishing shall increase in a big way, as technology is facilitating and authors of research papers and the funding institutions have been realizing the importance of open access resources and supporting the open access movement. In the light of these developments, Librarians have to play a proactive role in developing skills and acquiring IT competencies in exploring and providing exhaustive literature/information services to their library users.

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10. *http://www.ncbi.nlm.nih.gov/pmc/index.html*
11. *http://www.plos.org*
12. *http://www.freeBooks4doctors.com*
13. *http://www.freemedicaljournals.com*
14. *http://www.amedeo.com*
15. *http://www.indianmedicalsites.in*
16. *http://www.medknow.com*

# Open Educational Resources for Teaching and Learning

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## Abstract:

*Open Educational Resources allows us to share our own educational materials freely and extend our reach for teaching and educating others. OER's are able to be accessed online and it's another example of the positive role the internet has hadon access to education, but OER goes beyond accessibility because they also recognize the importance of flexibility and if reusing and sharing the resources created. And also OER's helps to achieve the goals that everyone in the world should have access to high quality educational experiences and resources.*

***Key Words:*** *Open Educational Resources, OER's, Creative Commons, Open Licenses and MOOCs, Digital Repositories, Institutional Repositories.*

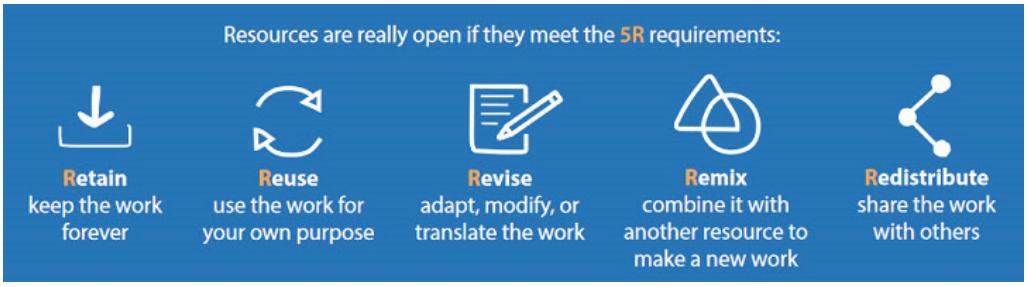
## Introduction:

Open Educational Resources are educational materials like workbooks, lecture slides, notes, quizzes, lesson plans, lecture recordings, textbook drafts, unpublished research works and so much morethat are openly licensed and freely available to be used and reused legally in more ways than traditionally copyrighted materials online. The most common open licenses for OER are Creative Commons Licenses. These customizable licenses show users what they are allowed to do with your resource. Can they edit it, sell an adapted version of it and combine it with other materials. These Creative Commons Licenses make the answers clear.

## OER really help to Students and Faculty:

Having freely available resources removes the roadblock that high textbook costs placed on education and makes the materials more accessible for everyone.

And class that use ORE aren't too different from traditional classes either. If students aren't scared and worried about affording their course materials, they are able to put the time and effort into their classes that they need to succeed. David Wiley summarized the OER's in his five laws framework of Retain, Reuse, Revise, Remix and Redistribute. This framework emphasizes the point that all users of OER content are able to carry out any of these activities with that content. Materials can be retyped, retained and reused indefinitely if the material is no longer, current users can revise the material. They can also combine or makes parts of an OER with any other material and use that in their own teaching. Whether they do or do not make changes they are also able to redistribute or share the content and any subsequent users are also able to adapt, to combine and share the material and so on.




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OER's are not the same as Massive Open Online Courses (MOOCs). OER's and MOOCs are both part of the online learning environment but they differ in the ways they are able to be used. MOOCs are hosted on online platforms such as SWAYAM, NPTEL while the content is freely available. Many courses run only during specified periods and users must register to take these courses. The content of MOOCs is accessible to the registered users only and it cannot be reproduced or reused without specific authorization. MOOCs and OER's both aspire to provide

universal access to high quality education but they differ in the ways they allow their resources to be used. The MOOC model is more rigid while OER's are created with the intention that they will be freely available and sharable. The major difference is that MOOCs are aimed more at the individual student or learner. While OER's are primarily aimed at making resources available to educators which can be assigned to students. The educator is still responsible for assessing student progress and outcomes.

**Availability of Open Educational Resources:**

"The most common location for any OER to be found is in a digital repository hosted by an institution (such as a consortium or a University). Repository systems are designed with open access in mind and you can deposit your OER in them with the expectation that they will be findable and accessible to everyone. Digital Repositories offer a convenient infrastructure through which to store, manage, re-use and curate digital materials. They are used by a variety of communities, may carry out many different functions and can take many firms. Digital repositories are also commonly referred to as institutional repositories or digital archives".

**Creating Open Educational Resources:**

Before you begin to create a new resource, consider how effective it will be in your course, whether its use will improve or enhance student learning in some way and whether it will be usable and useful outside of your course as well.First,you need to consider what course objects you want your OER to meet. According to a 2020 study of faculty using OER in their courses, there are four major considerations that instructors have to consider when implementing OER. "The effectiveness of the material, the efficiency of using the material, the appeal of the resource over traditional methods and extension or the materials ability to extend learning opportunities and accessibility". This study looked into the usefulness of OER that have already been created, but it works when considering a new project as well.This is an open source, which means it has to be somewhat customizable for other learning environments.The second facet to consider when creating an OER is whether you already have a resource that could be expanded upon or made open as it is. Open Educational Resources aren't just textbooks. They are also lecture slides, notes, quizzes, lesson plans, lecture recordings, textbook drafts, unpublished research works and so much more. You can edit course notes that you have been using for years into a textbook chapter or you can openly license

and share instructional videos online look around at what you have already. If you have been teaching for a few years chances are you have some materials, you have developed that you can make into something great.

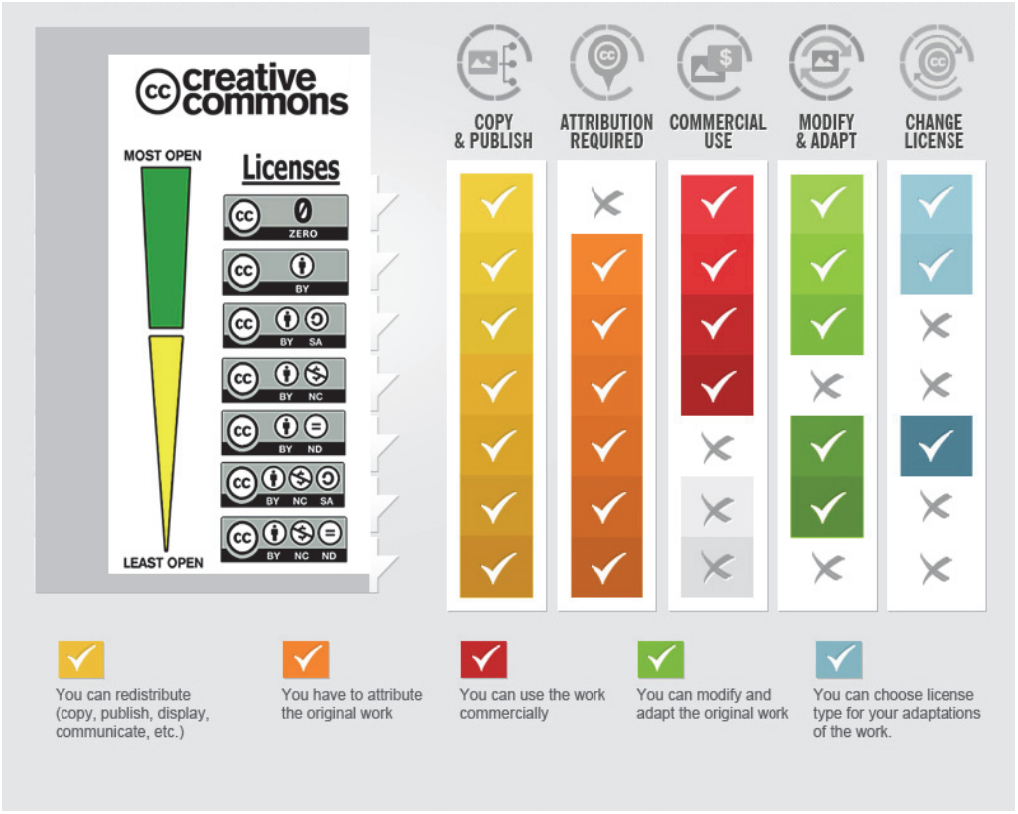
**Tools to create Open Educational Resources:**

Tools like Google docs and Microsoft word can be great starting points for writing open texts and there are online tools you can import these texts into for sharing later on, if you would like to update them or share them in a more accessible format. One tool you can use to create your own OER is the Open Author tool from OER Commons. OER Commons tools are completely free to use, and you have the ability to share outside resources and web pages on OER Commons as well. When you are creating a new source in OER Commons interface, you can get the basic features like headings, subheadings and the ability to put images or special characters into your text.

Upload your content at OER repositories like OER commons and the Open Textbook Library, media sharing sites like You Tube for video resources. If you want to keep your resources nearby, ask your institutional digital repository if they can host your content as well. There are a lot of options to choose from, and you can even host your resource on multiple sites. But remember if you share your resource on multiple sites, you will also need to update it on each of them as well. Consider how you will address these concerns before posting your resource everywhere.

**Open Licenses for OER's:**

The most common type of open license attached to open educational resources are Creative Commons Licenses. Which are in six basic types and each license allows users to have certain permissions when reusing a resource. Before you put out a new OER, it is important that you consider what rights you want to retain over your resource and what rights you want to allow users to have. For example, do you want users to be able to update your resource or edit it? These considerations will affect what license you give your resource, once it's been created.




## Creative Commons:

**Public Domain Dedication (CC0):**This is considered a dedication to the public domain and thus the creators associated with this item have waived all their rights to the work Worldwide under copyright law.

**Attribution (CC BY):**Others can copy, distribute, display, perform and remix the work if they credit / cite the creator / author.

**Attribution Share Alike (CC BY-SA):** Others can distribute the work only under a license identical to the one attached to the original work.

 **Attribution –No Derivs (CC BY-ND):**Others can only copy, distribute, display or perform verbatim copies of the work. (No modifications allowed.)

 **Attribution –Noncommercial(CCBY-NC):** Others can copy, distribute, display, perform or remix the work but only for non-commercial purposes.

 **Attribution –Noncommercial - Share Alike (CC BY-NC-SA):** Others can copy, distribute, display, perform or remix the work non-commercially, and can distribute the work only under a license identical to the one attached to the original work.

 **Attribution –Noncommercial – No Derivs (CC BY-NC-ND):** Others can only copy, distribute, display or perform verbatim copies of the work, but they cannot change them in any way or use them commercially.

**Government of India Initiatives on OER's:**

**SAKSHAT:** The President of India Dr. A.P.J. Abdul Kalam launch Sakshat on 30th of October, 2006. Which is a free portal that provides a much needed solution to educational requirements of learners from all age groups and all fields of study including vocational education and the learning of life skills. Which will provide a new dimension to teaching learning transaction at all possible levels. Sakshat is a One Stop Education portal initiated by the MHRD under the NMEICT. Within Sakshat repository various links are provided wherein the content developed through different platforms under the NMEICT. Wherein stakeholders can access course wise e-content being developed for School Education and Higher education.

SWAYAM, SWAYAMPRABHA, NDLI, NPTEL, e-PG Pathshala,Shodhganga,e-Yantra, e-ShodhSindhu, FOSSEE, Spoken Tutorial, Virtual Labs, SAMARTH (University Enterprise Resource Planning), VIDWAN, IRINS, Shodh Shudhhi (PDS), NROER, DIKSHA, NISHTHA are the initiatives by

MHRD under the National Mission on Education through ICT, that everyone in the world should have access to high quality educational experiences and resources.

**Efficacy and Perceptions of Open Educational Resources:**

**"**In order for faculty to replace commercial textbooks with OER, they not only need to be aware of OER, they also want to know that OER have proven efficacy and trusted quality. Students who use OER tend to do as well or better that their peers using traditional textbooks in terms of course completion and passing rates. Literature indicates that open textbooks are connected with high student and faculty satisfaction, lower costs and similar or better educational resources".

**Conclusion:**

There is a problem in higher education today, the problem of high textbook costs. Students today are having a rough time affording all the costs of higher education and textbooks are a big part of that. These high costs can have a huge impact on students causing them to drop classes and even majors. Infact, some students have reported not buying the textbook they need for a class, just because they know they can't afford it. It's not worth the cost. The solution for this is Open Educational Resources. Due the COVID-19 lockdown, students do not have access to books to read and refer to what they are being taught. Educational Institutions, Industries and Research Organizations are promoting Open Educational Resources through their Institutional repositories for the benefit of the user community.

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# Digital Education and its Tools Use in COVID-19 Pandemic

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## Abstract

Digitalization in education refers to the use of desktop computers, mobile devices, the internet , software applications and digital communication tools . IT affects all aspects of human activity, and education is not an exception, today, the nature of education has changed, with digital education becoming an increasingly popular option in modern education. Digital Classroom" is a topic of discussion in education sector these days. COVID-19 pandemic changed classroom management adits proved to be a boon for both teachers and students.

**Keywords**: Digital learning, Information technology, ICT,Technology management, Digital tools, COVID 19, Classroom management, Software, Digital classroom.

## COVID-19 Pandemic has changed Education Scenario

The outbreak of the corona virus pandemic has created immediate and unprecedentedchallenges in the field of education and as well as occupation, . As of 31st March, 185countries around the globe have implemented or announced the closure of schools anduniversities. Nearly 1.5 billion children and youth have been impacted by the crisis. In India,schools were among the first of many organizations which started shutting down as aprecautionary measure to prevent the spread of the virus.The concept of education changed overnight and in these times of crisis, digital learning hasemerged as an indispensable resource for education. Digital technology is providing all sortsof remote learning opportunities for students across the globe and enabling teachers to createintriguing (virtual) experiences.

All around the world, schools are leveraging existing platforms from the likes of Googleclassroom, Microsoft Education ,Flipgrid, Padlet, Email, Zoom,Google Meet, Kahoot.The COVID-19 Digital Classroom was established to meet this challenge. We are dedicatedto leveraging digital technologies and existing content distribution channels to ensure everyhealth worker has the information they need to

help their own communities, wherever in theworld they are providing care, from city centers to the last mile.The COVID-19 has resulted in schools shut across the world. As a result, education haschanged dramatically, with the distinctive rise of e-learning, whereby teaching is undertakenremotely and on digital platforms.

## Digital Communication

Effective digital communication is the ability to create persuasive communications usingdifferent forms of media. Digital communication is a foundational skill for many careerstoday since most people will be involved in some form of conceptualizing, producing,delivering, and receiving these communications in their jobs and personal lives. Starting inelementary school and extending to higher education, students can learn a variety of digitalcommunication skills across all courses, whether they build multimedia presentations todemonstrate their knowledge of academic subjects, create e-portfolios of coursework, orpresent ideas in a virtual classroom.

## Digital Technology Change Everyday Life of Young Generations

Schools and education of children should undergo an extensive digital transformation to be able to meet the needs of the young generation and their digitalized future. The COVID-19 pandemic has suddenly and abruptly forced schools and education indeed to engage in such a transformation.The young generation needs to understand and be able to make informed decisions on how to utilize digital technologies in everyday life in meaningful ways. Furthermore, we maintain that the digital divide concerns design and development of such technology, too. It is important that the young generation adopts a critical and proactive stance towards digital technology, i.e. they should critically consider how it could and should be, not merely accept how it currently is. For this to happen, the young generation needs to gain skills and competences to innovate, design, program, make, and build digital technology. schools and education of children should undergo an extensive digital transformation to be able to meet the needs of the young generation and their digitalized future. The COVID-19 pandemic has suddenly and abruptly forced schools and education indeed to engage in such a transformation. In India, two special educators, one at a private special school and one at an integrated pubic school, have similar experiences with going online with their teaching within days after the lockdown in India was announced. They were both already using technology for their day to day interventions with their students, including tablets, computers, and online videos on YouTube.

## Information and Communication Technology (ICT) in Education

Schools use a diverse set of ICT tools to communicate, create, disseminate, store, and manageinformation. ICT has also become integral to the teaching-learning interaction, through such approaches as replacing chalkboards with interactive digital whiteboards, using students' ownsmart phones or other devices for learning during class time, and the "flipped classroom" model where students watch lectures at home on the computer and use classroom time for more interactive exercises.Virtually all institutions around the world have adopted e-learning. This mode of learning involves the admission of both local and international students in higher learning institutions. Learning content, exams, and results are delivered through the internet. This means that it is possible for a student to be admitted to a university and graduate without setting foot into the physical university. As an advantage, E-learning has reduced congestion in top universities around the world.

## Digital Classroom Management

### Google for Education:

Google launches 50 new product features to help remote education in India! During the corona virus pandemic-induced lockdown, the demand for remote teaching and learning applications had increased rapidly. Amid this, search engine giant Google had stepped in to aid the crores of Indian students.

### Changes in G Suite for Education

First things first. The G Suite for Education is now being changed to Google Workspace for Education to give teachers and educators more control and choices. This workspace would continue to include the same products as before, including Meet, Docs, Sheets, Classroom, Gmail, Calendar, Drive, etc.

### Google Meet

Google Meet is a video conferencing tool that allows students and teachers to teach and learn from anywhere. Google Meet is a video conferencing service from Google. It's a great solution for both individuals and businesses to meet on audio and video calls. It was born from Google Hangouts, but boasts some unique features.

### Google Classroom

Google Classroom really provides tons of possibilities for how to create, assign, and facilitate learning. For instance, with add-ons like Kami, teachers can mark-up student work and hand it back without leaving the application. In terms of differentiation, teachers can assign work to select students instead of the entire

group. With the level of organization possible with Google Classroom, teachers may find that they can facilitate universal design for learning content and activities to their students. Because Google Classroom takes on all of the back-end organization (folders are created inthe teacher's Google Drive for each class, and each class has folders for each assignment), it's easy to go back and reference previous assignments or specific student work. And sinceGoogle Classroom now integrates with Google Meet, classes can access video meetings with easy to find links. Teachers can take advantage of all of the recent education-centric upgrades to Meet -- like Q&A, polls, and hand-raising -- to keep kids engaged and actively participating. Automatic grading also makes it super easy to use exit tickets as a formative assessment. Use the class Stream for social purposes, check ins, announcements, or specificdiscussions.

**Google Classroom Advantages**

**1. Easy to use and accessible from all devices.**

if you are not a Google user, using Google Classroom is very easy to use .Apart from being delivered through the Chrome browser, which makes it accessible from all computers, mobile phones, and tablets, it makes it really easy for you to add as many learners as you like, create Google documents to manage assignments and announcements, post YouTube videos, add links, or attach files from Google Drive. Learners will find it equally easy to log in, as well as receive and turn in assignments.

**2. Effective Communication and Sharing.**

One of the greatest advantages of Google Classroom is Google Docs; these documents are saved online and shared with a limitless number of people, so when you create an announcement or assignment using a Google doc, your learners can access it immediately through their Google Drive, as long as you have shared it with them.

**3. Speeds up the Assignment Process.**

How about creating an assignment and distributing it with just a click of a button? And how about learners turning in the completed assignment in a matter of seconds? Assignment process has never been quicker and more effective, as in Google Classroom you can easily check who has submitted their assignment.

**4. No need for paper.**

Google Classroom is certainly interested in getting there as soon as possible to centralizing eLearning materials in one cloud-based location, you have the ability to

go paperless and stop worrying about printing, handing out, or even losing your learners' work!

**5. Clean and user-friendly interface.**

Google Classroom invites you to an environment where every single design detail is simple, intuitive, and user-friendly.

**6. Great commenting system.**

Learners can comment on specific locations within pictures for a variety of online courses. Furthermore, you can create URLs for interesting comments and using them for further online discussion.

**7. Is for everyone.**

Educators can also join Google Classroom as learners, which means that you can create a Google Classroom for you and your colleagues and use it for faculty meetings, information sharing, or professional development.

**Google Classroom Disadvantages**

**1. Difficult account management.**

Google Classroom doesn't allow access from multiple domains. Furthermore, you cannot log in with your personal Gmail to enter it; you need to be logged in Google Apps for Education. As a result, if you have already a personal Google ID, it may be frustrating to juggle multiple Google accounts.

**2. Limited integration options.**

Google Classroom has not yet integrated with Google Calendar, or any calendar whatsoever, which may cause some problems with organizing material and assignment deadlines.

**3. No automated updates.**

Activity feed doesn't update automatically, so learners will need to refresh regularly in order not to miss important announcements.

**4. Difficult learner sharing.**

Learners cannot share their work with their peers, unless they become "owners" of a document, and even then they will need to approve sharing options.

**5. Editing problems.**

When you create an assignment and you distribute it to learners, learners become "owners" ofthe document and they are allowed to edit it. That means that they can delete any part of the assignment they want, which could cause problems, even if it happens accidentally.

**6. No automated quizzes and tests.**

One of the main reasons that Google Classroom cannot yet fully replace your Learning Management System is that it doesn't provide automated quizzes and tests for your learners. In general, Google Classroom is more suitable for a blended learning experience than a fully online program.

**7. Impersonal**

Speaking of a blended learning environment, Google Classroom has not integrated Google Hangouts, which creates a problem; online interaction between teachers and learners is only possible through Google documents.

**Edmodo**

Edmodo is a centralized classroom for teachers, students, and parents where they can connect with each other and find the resources required for their learning course. It is a safe space for discussion where even students who are not outspoken and cannot speak in traditional classrooms can easily convey their views. The teachers can assign work to the students, parents can track the progress of their children, and students can find lessons as well as discuss the issues relating to their studies. It can also be integrated with G Suite for Education, helping students to submit and review their assignments.

**Zoom**

Zoom is a video-calling app that is ideal for large groups because it supports up to 100 users for free.It is widely being used for meetings, online learning, and university lectures, among other things. Theapp has become immensely popular as people have been forced to stay indoors due to the lockdown. The free version of Zoom allows users to enjoy unlimited 1-on-1 meetings along with group calls featuring up to 100 participants for 40 minutes.

**Advantages and Disadvantages of Zoom App**

**1. Easy to Use and Deploy**

Zoom is super easy to use – just download, click it, set it up, and you are off and running. This is one of the easiest pieces of video conferencing. Zoom provides all the enterprise-level features that make webinars, online training, video conferences, and virtual meetings far more engaging, and interactive.

### 2. Interoperability

You can connect to a virtual meeting via desktop, laptop, & mobile devices like seamlessly.

### 3. Zoom App Pricing goes easy on the budget

The application is free for personal use for small business that sets it apart from therest of the conferencing apps that are heavily pricey.

### 4. Zoom makes your work more flexible

You don't have to worry about space to start a virtual meeting anymore. Zoom in and join other participants from anywhere you want. This communication app hands you right-on solutions to carry out important business meetings lets you move freely without any hassles

### 5. Better Service on Slow Connections

Handling 100 participants simultaneously zoom offers an agile environment for business meetings and webinars. Since your data is backed up at cloud servers, you don't have to worry much about low-bandwidth. That said, a maximum of 100 participants can screen-shareand conduct a fruitful conversation from a remote location.

### 6. A Centralized Platform

Zoom conferencing is not just restricted to webinars and virtual meetings. Participants can communicate anytime through live chats in the middle of the conversation.

### Disadvantages of Zoom

### 1. Delayed Customer Service is a Disadvantage

In a recently published review, a user has reported bad service by the customer service department. A service representative may take 2 to 3 days to reach you with a suggestive solution. This limitation is acknowledgeable at times when you have no other options to carry out your work with rising demand for video conferencing methods.

### 2. Zoom Security Concerns- Intrusion by Outsiders

Early in April of 2020, a report published in the Indian News Media revealed that hackers used the corona crisis to target remote workers. A group of hackers zoom-bombed hacking user-passwords and took over the virtual meetings.

### 3. Cyber Attacks may shrink the number of users

If Zoom Conference Security Risks are not taken care of on time, the developing companymay face an economic backlash by losing a huge amount of users simultaneously.

**Microsoft Teams**

Microsoft Teams is a digital hub that brings conversations, content, assignments, and apps together in one place, letting educators create vibrant learning environments. Build collaborative classrooms, connect in professional learning communities, and connect with colleagues – all from a single experience. Within Teams, educators can quickly converse with students, share files and websites, create a OneNote Class Notebook, and distribute and grade assignments. Built-in OneNote Class

Notebooks and end-to-end assignment management allow educators to organize interactivelessons and provide effective and timely feedback. Educational institute administrators and staff can stay up-to-date and collaborate using Staff Teams for announcements and topical conversations. Educators can share instructional material using Professional Learning Communities.

**Pros of Microsoft Teams**

**1. Productivity gains and enriched communication**

Teams increases productivity by making all your collaboration– conversations, chats, online meetings, shared files, tasks, etc. In addition to the widely used apps from Microsoft, youhave a wide range of 3rd party apps that integrate into Teams so that your users never have to leave the Teams app to get their work done.

**2. Better focus on your work**

With Teams, you can easier focus your attention on work-related topics and prioritize your time better. Instead of spending time going through an inbox that contains messages from everyone about everything, Teams compartmentalizes information into channels and puts your information in context.

**3. Increased transparency**

With Teams, you post your message in the relevant channel, @-mention the people you wantto get notified and leave it for everyone else to read if they want, and by having meetingsvisible to everyone in the channel you increase transparency by enabling everyone in thechannel to "pop-in".

**4. Seamless move to a digital workplace**

There are so many business benefits of moving to a digital workplace in the cloud. SinceTeams is a fully cloud-based solution, the move to the cloud is seamless. Being able to accessinformation from anywhere on any device is a huge business benefit. In addition, with yourworkplace in the cloud, you can reap the benefits of big data processing and artificialintelligence to work smarter.

**5. New team members can more quickly get up to speed**

With Teams, you can quickly get new team members up to speed and engaged in theteamwork – no matter where in the world they are located.

**Cons of Microsoft Teams**

**1. Difficult transition from Outlook**

The best way to transition to Teams is for everyone who is a member of a team to fullyembrace Teams and stop using Outlook all together (except for external communication).However, since there is still a deeply connected dependency on Outlook in Office 365 thisbecomes a challenge.

**2. Structure of files confuse users**

Millennial and Generation Z don't care "where" files are physically stored, they just searchfor what they need. Many users still like to know "where" a file is located and go through afolder structure to find it. The way files are stored in Teams can be quite confusing.Everything that is uploaded to conversations is dumped in the channel root folder. If someonetries to organize the files and move them into properly named folders, the file links in theconversations break.

**3. Non-optimal online meeting experience hinders adoption**

Microsoft has been working hard to include the Skype for Business meeting functionality into

Teams and they have done a good job an also added new capabilities that weren't therebefore. But the meeting experience still isn't ideal, there are some things that are still not veryintuitive and it doesn't promote some of the great capabilities available in Teams for meetings

**4. Challenges regarding permission settings**

One of the key benefits with Teams is that it makes sharing so easy. Everyone who is amember of the Team automatically has access to all the channels and all the files in the Team,the same OneNote notebook, and so on. This is all great. But teamwork isn't always thatbinary. Sometimes you want to differentiate and make

permission settings more regular –which is not possible at the moment. You can create private channels in a team to createunique permissions for a specific channel (for instance "Management"), but you don't havethe ability to invite "guest users" to selected channels.

**5. Limited flexibility can lead to manual replications**

When you start working in Teams you don't have the structure ready from start. You don'tknow which channels you need, you might not know exactly what Teams you need to create. This evolves over time with the work that you

**Flipgrid**

Flipgrid is a free resource that allows you to communicate with videos! This can be the perfect way to help your students interact with each other and build relationships. You can also set it so that only you can see the videos your students post, and use this as a way for students to ask questions. Flipgrid can also be used to send videos to your students' parents! There are so many options!

**Emails**

E-mail is a customizable, fast, economic, and effective communication channel, that you can communicate with students, among students, teachers, parents, guardians, managers and others.E-mail can be a good way to establish new communication channels in class; It is also an interesting resource to share content, videos, graphics, class work, communicate with students from other areas, practice languages, etc.

**Using emails in class:**

Dedicating a class or specific class time for the activity. Establishing basic rules for sending emails.

Students must be properly informed of how to use the email service used in class. It is interesting to have a specific email account for school communications. There may be a limit of emails that must be sent each week. You must establish the topics that can be discussed by email and those that can not.

Take care of grammar and spelling, avoid capital letters, do not send very heavy files. Always without insulting, annoying, spamming or doing anything that could have negative consequences. Make a list or group of contacts with the students' data. It is interesting that the students send an email with their data on the first day of class. Full respect for others must be encouraged. The emails sent to the teacher must always be answered, better with a motivating and well thought out message.

There may be some sanctions for those who do not meet the rules of sending emails in class.

**Padlet**

Padlet is a free online tool that is best described as an online notice board. Padlet can be used by students and teachers to post notes on a common page. The notes posted by teachers and students can contain links, videos, images and document files.Padlet can be used by students and by teachers. With padlet you can create an online post-it board that you can share with any student or teacher you want. Just give them the unique Padlet link. Padlet allows you to insert ideas anonymously or with your name. It's easy to use and very handy.

**Kahoot**

Technology is being increasingly integrated into teaching environments in view of enhancing students' engagement and motivation. In particular, game-based student response systems have been found to foster students' engagement, enhance classroom dynamics and improve overall students' learning experience. Kahoot is a game-based learning platform, used as educational technology in schools and other educational institutions. Its learning games, "Kahoots", are user-generated multiple-choice quizzes that can be accessed via a web browseror the Kahoot app. Kahoot! can be used to review students' knowledge, for formative assessment, or as a break from traditional classroom activities. Kahoot! also includes trivia quizzes.

As a teacher, this is an easy way to see everything a student is working on and provide feedback! Seesaw also includes choice in how students work: drawing, recording, collages, videos, etc. Families are able to use the Parent and Family app to stay connected with their child's learning and progress.

**The Elements of Digital Classroom**

**Spaces:** The digital classroom should not only be equipped with digital devices but there should be spaces for other activities. The classroom should be 1:1 which means 1computer/laptop for each student. For instance, for a group discussion or Reddit or Quora toconduct QNA sessions, a personalized device is required. In this way they would be moreengaged and interested to learn. The digital classroom should also have space for physicalactivities. It has the potential to make learning entirely personal for each student to connectwith other peers at the same time. However, the notifications or the temptation to play can bea disturbance at times.

**Tone:** One of the noticeable features of a digital classroom is its tone. From the workflow ofteachers to the pace at which assignments are given, the buggy

software etc makes theambience of digital classroom distinct from the traditional classrooms. The digital classroom makes it easier to put student's progress on display but the classroom management becomesdifficult in this kind of setup.

**Feedback:** In the traditional system, teacher's correcting assignments often days later are notable to provide oral feedback in the moment. But in a digital learning space, the game-basedlearning assignments enables for an immediate feedback right at the time. These platforms letstudents know if the answer is correct or not by offering a pop-up dialog box or anyappropriate symbol like 'X' instantly.

**Technology:** It is the most crucial part of digital learning spaces. The Wi-Fi, hardware orsoftware, operating systems or the digital media platforms incorporates the technology. It isubiquitous and thus seems very important. The social media platforms like Facebook,Instagram, YouTube channel falls under technology.

**The workflow:** Workflow means it starts with teacher to students and flows back to teachersfrom students. For instance, the relationship between a teacher and a student forms a circle byteacher giving the assignment and students completing it and returning it to the teacher. Indigital space, it is the same by student learning from khan academy and completingassignments and sending it via google drive. The major advantage is the group activities canbe initiated more conveniently in digital learning platforms. Teachers can assign activities to agroup of 10 or 12 students and divide them into smaller groups. Post the activity the teacherscan evaluate it and publish it on social platforms for the public to see and appreciate the work. Digital provides with more opportunities for critical evaluation and creative feedback with psychological support.

**The data:** It is very important for providing valuable feedback in a digital environment. Thedata can be stored or shared through the learning models and can be customized orpersonalized as per the requirement of each student.Purpose and audience: the purpose of digital education is to extract the essence of moderneducation at its best possible sense and create a digital audience representing contemporarylearning. We have to see whether the existing audience is capable enough to utilise thetechnology and move into modern education incorporating these devices.

**Opportunities:** Since the students are learning in digital mediums, its obvious that they willcreate new things and various organizations, media, brands etc will definitely have digitalplatforms. This provides countless opportunities for the youth

to engage in different fields outof the classroom. Initiating a project digitally will reach out to masses in a short period oftime.

## Advantages of Online Learning

### 1. Efficiency

Online learning offers teachers an efficient way to deliver lessons to students. Online learninghas several tools such as videos, PDFs, podcasts, and teachers can use all these tools as part oftheir lesson plans. By extending the lesson plan beyond traditional textbooks to include onlineresources, teachers can become more efficient educators.

### 2. Accessibility of Time and Place

Another advantage of online education is that it allows students to attend classes from any location of their choice. It also allows schools to reach out to a more extensive network of students, instead of being restricted by geographical boundaries. Additionally, online lectures can be recorded, archived, and shared for future reference. This allows students to access the learning material at a time of their comfort.

### 3. Affordability

Another advantage of online learning is reduced financial costs. Online education is far more affordable as compared to physical learning. This is because online learning eliminates the cost points of student transportation, student meals, and most importantly, real estate. Additionally, all the course or study materials are available online, thus creating a paperless learning environment which is more affordable, while also being beneficial to the environment.

### 4. Improved Student Attendance

Since online classes can be taken from home or location of choice, there are fewer chances of students missing out on lessons.

### 5. Suits A Variety of Learning Styles

Every student has a different learning journey and a different learning style. Some students are visual learners, while some students prefer to learn through audio. Similarly, some students thrive in the classroom, and other students are solo learners who get distracted bylarge groups.The online learning system, with its range of options and resources, can be personalized in many ways. It is the best way to create a perfect learning environment suited to the needs of each student.

## Disadvantages of Online Learning

### 1. Inability to Focus on Screens

For many students, one of the biggest challenges of online learning is the struggle with focusing on the screen for long periods of time. With online learning, there is also a greater chance for students to be easily distracted by social media or other sites. Therefore, it is imperative for the teachers to keep their online classes crisp, engaging, and interactive to help students stay focused on the lesson.

### 2. Technology Issues

Another key challenge of online classes is internet connectivity. While internet penetration has grown in leaps and bounds over the past few years, in smaller cities and towns, a consistent connection with decent speed is a problem. Without a consistent internet connection for students or teachers, there can be a lack of continuity in learning for the child. This is detrimental to the education process.

### 3. Sense of Isolation

Students can learn a lot from being in the company of their peers. However, in an online class,there are minimal physical interactions between students and teachers. This often results in a sense of isolation for the students. In this situation, it is imperative that the school allow for other forms of communication between the students, peers, and teachers. This can include online messages, emails and video conferencing that will allow for face-to-face interaction and reduce the sense of isolation.

### 4. Teacher Training

Online learning requires teachers to have a basic understanding of using digital forms of learning. However, this is not the case always. Very often, teachers have a very basic understanding of technology. Sometimes, they don't even have the necessary resources and tools to conducts online classes.To combat this, it is important for schools to invest in training teachers with the latest technology updates so that they can conduct their online classes seamlessly.

### 5. Manage Screen Time

Many parents are concerned about the health hazards of having their children spend so many hours staring at a screen. This increase in screen time is one of the biggest concerns and disadvantages of online learning. Sometimes students also develop bad posture and other physical problems due to staying hunched in front of a screen.A good solution to this would be to give the students plenty of breaks from the screen to refresh their mind and their body.

## Conclusion:

In the time of COVID-19 the information technology has affects all aspects of human life like education, shopping, skill enhancement etc. There has been a shift in paradigm of how education is imparted from traditional to using modern tools. This shift has made learning a fun activity rather than a burden. In the current scenario, modern classrooms use technology in the form of Internet-connected devices and digital classroom management software, enhancing the functioning of teaching, learning and communication. During an epidemic like COVID-19, a classroom management software has proved to be a boon for both teachers and students. Technology management has given us so many apps. Through this app we can communicate to each other easily. There are so many digital tools for communication that work both for an in-person or remote setting. So can say that the education technology has completely changed education. Today education has taken the form of a new one,because due to COVID- 19.

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# Open Educational Resources: Indian & Global Scenario

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## ABSTRACT

*With enormous advancements in ICTs, the education system of today has been improved by different OERs. The ideal usage of chances given by the mechanical improvements presents a significant test for instruction frameworks and has genuine ramifications including cost, access, value, teaching method and quality. The paper examines different freedoms and difficulties introduced by the utilization of OERs in the education system of today. The different significant drives taken in India and global focusing on legitimate use of ICTs are additionally featured. The paper likewise talks about the job of libraries in advancing the utilization of OER's in instructive foundations.*

**Key words**: *Open educational resources, Indian initiatives , Global initiatives*.

## INTRODUCTION

Information communication technology have given incredible assets to spread of information over a wide range. This makes it exceptionally helpful for further developing access and value in the whole schooling area. ICTs can be utilized to supplement the proper schooling framework just as the distance instruction framework at all levels. The utilization of OERs holds extraordinary guarantee of working on the admittance to and the general nature of instruction for the created just as the agricultural nations. The instructors are making and utilizing advanced substance for educating and learning. The admittance to quality substance is conceivable just for the individuals who go to advanced education organizations or the people who can stand to buy the informative material. The OER development intends to make this substance accessible with the expectation of complimentary use for improving instructive freedoms for until recently unreached segments of the general public consequently prompting balancing of access . OERs can assume an indispensable part in the current situation of distance learning by working on quality, access, reach and furthermore giving upper hand and acknowledgment all around the world. There is a huge development in the quantity of OER projects across the world. In India likewise various significant drives are being taken up to implant the OERs into the instructive conditions of today by Indian colleges. The Indian Government plays had a proactive influence by giving stimulus to the

development of OER development in the country through different public arrangement drives. An enormous number of public policymaking bodies like National Knowledge Commission (NKC),University Grants Commission (UGC) and other warning bodies are offering the help to the development in the country for further developing admittance to quality training.

The paper depends on optional information gathered from different sources. The paper additionally examines different OER drives taken up in India and global by various organizations. It additionally ponders a portion of the drives at a Nation Open University. The paper examinations the difficulties related with the turn of events and utilization of OERs in distance learning establishments in an agricultural nation like India.

## CONCEPT OF OERS

The Open Education Resources (OER) have arisen as a valuable method for giving top notch schooling to the majority. OERs and MOOCs are at the cutting edge of the open training development and have become essentially significant in instruction frameworks across the world. As referenced by Olcott (2013, p.15) with uncommon development of open training frameworks, content and advancements, ―we are near the very edge of a state-of-the-art existence for education‖. The different advancements in computerized innovations have assumed a reactant part in the open training development.

The term OER was first utilized at the UNESCO discussion on the capability of open courseware for advanced education in non-industrial nations in the year 2002. The William and Flora Hewlett Foundation, characterizes OER as ―teaching, learning, and exploration assets that dwell in the public area or have been delivered under a protected innovation permit that allows their free use and once again purposing by others. Open instructive assets incorporate full courses, course materials, modules, course readings, real time recordings, tests, programming, and some other apparatuses, materials, or strategies used to help admittance to information" (Atkins, Brown and Hammond, 2007). As indicated by OECD (2007), OER is said to include:

- Learning Content: Full courses, courseware, content modules, learning articles, assortments and diaries.

- Instruments: Software to help the turn of events, use, re-use and conveyance of learning content including looking and association of content, content and learning the executives frameworks, content improvement devices, and web based learning networks.

• Execution Resources: Intellectual property licenses to advance open distributing of materials, plan standards of best practice, and limitation of content.

The OER development started with the Massachuetts Institute of Technology's (MIT) Open Course Ware (OCW) drive which made the substance from MIT's courses uninhibitedly accessible on the web (Hylen, 2006). This was trailed by comparative drives by Stanford, University of Pennsylvania, University of Michigan, Utah State University, etc (Conrad,2013). Somewhat recently the development has become massively around the world. There exist various drives, for example, Open learn by UKOU, Open Learning Initiative via Carnegie Mellon University, Connections, Creative Commons and Internet Archive, Peer to Peer University (P2PU), Udacity, Coursera, Wikieducator, and OpenStudy, to make reference to a couple. OERs have gotten acknowledgment from global associations, like UNESCO, COL, OECD, World Bank and the European Commission; with these association being engaged with advancement, normalization and strategy improvement (Kursun, 2014; Knox, 2013). The development of the OER development has been invigorated by subsidizing from altruistic associations like Hewlett Foundation, Mellon Foundation, and furthermore global associations like UNESCO and COL.

## OPEN EDUCATIONAL RESOURCES IN INDIA INITIATIVES

India accepted OER continuously 2007, with help from government and outer financing offices (James and Bossu, 2014). India is a functioning player in the OA development with an enormous number of OA electronic journals, OA archives and open source programming based digital repositories. A portion of the open access drives have contributed generally to the creation, usage and extension of OER in India. These are as per the following:

### National Digital Library of India (NDLI)

The National Digital library of India is an initiative of IIT Kharagpura project under Ministry of Education, Government of India. The objective is to collect and collate metadata and provide full text index from several national and international digital libraries, as well as other relevant sources. It is a digital repository containing textbooks, articles, videos, audio books, lectures, simulations, fiction and all other kinds of learning media. The NDLI provides free of cost access to many books in the Indian languages and English.

The Library was launched in pilot form in May 2016.The Library was dedicated to the nation on June 19, 2018, by union human resource minister Prakash Javadekar. As of April 2019, NDLI hosts 4,58,25,715+ (4.5 crore+) items in its repository, with over 1,50,000 volumes in English.

## ePathsala:

The National Council of Educational Research and Training (NCERT) is an autonomous organization set up in 1961 by the Government of India to assist and advise the Central and State Governments on policies and programmes for qualitative improvement in school education. The major objectives of NCERT and its constituent units are to: undertake, promote and coordinate research in areas related to school education; prepare and publish model textbooks, supplementary material, newsletters, journals and develops educational kits, multimedia digital materials, etc. organise pre-service and in-service training of teachers; develop and disseminate innovative educational techniques and practices;collaborate and network with state educational departments, universities, NGOs and other educational institutions; act as a clearing house for ideas and information in matters related to school education; and act as a nodal agency for achieving the goals of Universalisation of Elementary Education. In addition to research, development, training, extension, publication and dissemination activities, NCERT is an implementation agency for bilateral cultural exchange programmes with other countries in the field of school education. The NCERT also interacts and works in collaboration with the international organizations, visiting foreign delegations and offers various training facilities to educational personnel from developing countries. The major constituent units of NCERT which are located in different regions of the country

## National Program on Technology Enhanced Learning (NPTEL) :

This is a joint drive of the seven Indian Institutes of Technology (IITs) (IIT, Bombay; IIT, Delhi; IIT, Guwahati; IIT, Kanpur; IIT, Kharagpur; IIT,Madras; and IIT, Roorkee) and the Indian Institute of Science (IISc). The task was financed by Ministry of Human Resource Development (MHRD). It plans to upgrade the nature of designing training in the nation by giving simple admittance to educational program based video and web courses in designing and sciences. Online web and video courses are accommodated free, while confirmation programs are presented for an ostensible expense. The courses are modularised into center ideas and extra subjects. The materials are presented under a Creative Commons (CC BY-SA)license and are really planned that they can be tweaked for making courses for differed settings.

## National Repository of Open Educational Resources (NROER) :

NROER, by Ministry of Human Resource and Development (MHRD) and Central Institute of Educational Technology (CIET), National Council of Educational Research and Training (NCERT), is a learning storehouse for open instructive

assets. The vault gives a stage to creation and utilization of confined substance accessible in assortment of arrangements. The vault offers computerized assets like recordings, sound, intelligent media, pictures, wiki pages, and reports, for all school subjects and grades in numerous dialects. Content on the vault is delivered under a Creative Commons permit.

**E-PG Pathshala Project:**

This is a drive of UGC for giving free admittance to normalized e-reading material for postgraduate courses in various colleges of the country. The undertaking is taken up under NME-ICT and includes improvement of High quality, educational plan based, intuitive e-content in various subjects across all disciplines at postgraduate level.

SWAYAM (Study Webs of Active-Learning for Young Aspiring Minds):

Swayam stage is a drive by MHRD, to give free Massive Open On-line Courses (MOOCs) on a wide range of subjects. It is an Indian Open Source stage dependent on Open edX for giving mixed MOOCs in local Indian dialects. Microsoft has been chosen as the specialized accomplice for the task. Online seminars on SWAYAM stage will be made accessible by different accomplice foundations recognized by the National MOOCs facilitator. The undertaking expects to dispatch 2,000 gigantic open internet based courses (MOOC) for north of 30 million understudies this year.

OPEN EDUCATIONAL RESOURCES IN GLOBAL INITIATIVES

MERLOT**:**

MERLOT is a free online community of OER resources for faculty & students of higher education from around the world to share learning materials and pedagogy**.**

OPEN TEXTBOOK LIBRARY:

Textbooks in the Open Textbook Library are considered open because they are free to use and distribute, and are licensed to be freely adapted or changed with proper attribution.

LIBRARY INVOLVEMENT WITH OER

Libraries are reacting to the significant expenses of reading material by turning out to be effectively associated with the OER development. As solid promoters for furnishing benefactors with free or minimal expense admittance to data, libraries are rapidly taking advantage of the OER opportunity. Projects, for

example, Temple University's Alternate Textbook Project gives financing to workforce who pick to supplant exorbitant reading material with library-authorized or open substance and has saved understudies more than $300,000 starting around 2011 (Bell, 2015). Led from Temple's task, University of Massachusetts Amherst's Open Education Initiative, another personnel impetus program, has saved understudies more than $1,000,000 in likely reading material expenses (Billings et al., 2012; Lederman, 2014). These libraries are expanding their jobs nearby by guiding course book projects, regularly with managerial units like the Provost's Office, to decrease reading material expenses for understudies.Another significant job libraries play in the OER development is tracking down excellent open course materials alongside library authorized substance for the two understudies and employees (Bell, 2015). Rebecca A. Martin (2010) contends that more libraries need to give this ―value-added‖ administration to their personnel and understudies, setting aside both time and cash. Observing quality OER can demonstrate time-escalated and testing, and, as numerous in the writing attest, more preparing for custodians might be required (Martin, 2010; Mitchell and Chu, 2014; Okamoto, 2013). As Mitchell and Chu (2014) call attention to, curators are all around situated to assume the job of intervening between personnel, as the makers of OER and course material, and understudies, as the clients obviously material.

## CONCLUSIONS

The OER peculiarity has reformed the manner in which data is utilized and spread. It has prompted a rise of innovative investment in the improvement of advanced substance in the whole training area. Various creative drives pointed toward giving simple admittance to instructive assets have been taken up. Many Open Universities have taken up drives to make their instructive assets accessible in the public space. In any case, OER rehearses in India are as of now in an underlying phase of advancement and various issues should be thought of. However, the potential for development of the OER peculiarity in India can't be denied and all the more such drives ought to be empowered in the open and distance learning frameworks in India.

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# Open Educational Resources and Its Repositories

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## Abstract

*Open educational resources (OERs) are materials that can be freely downloaded, edited, and shared to better serve all students. These resources are typically free of cost, reducing barriers to access for students and ensuring that all learners can have access to educational materials regardless of their financial status. OERs have been demonstrated to improve student performance and retention, especially for students traditionally underrepresented in higher education. The aim of the current study is to know the OERs are available on topics related, whether sufficient resources exist to serve as primary course materials. There also do not appear to be sufficient resources to support a course. Implications for promoting the development and dissemination of OERs, particularly with respect to challenges of OER.*

**Keywords:** *Access, Financial Accessibility, Higher Education, Open Educational Resources*.

## Introduction

Open educational resources (OER) are freely accessible, openly licensed instructional materials such as text, media, and other digital assets that are useful for teaching, learning, and assessing, as well as for research purposes. The term OER describes publicly accessible materials and resources for any user to use, re-mix, improve, and redistribute under some licenses. The development and promotion of open educational resources is often motivated by a desire to provide an alternate or enhanced educational paradigm.

## Definition and scope

The idea of open educational resources (OER) has numerous working definitions. The term was first coined at UNESCO's 2002 Forum on Open Courseware and designates "teaching, learning and research materials in any medium, digital or otherwise, that reside in the public domain or have been released under an open license that permits no-cost access, use, adaptation and redistribution by others with no or limited restrictions. Open licensing is built within the existing framework of intellectual property rights as defined by relevant international conventions and respect the authorship of the work"

The above definitions expose some of the tensions that exist with OER:

- **Nature of the resource:** Several of the definitions above limit the definition of OER to digital resources, while others consider that any educational resource can be included in the definition.
- **Source of the resource:** While some of the definitions require a resource to be produced with an explicit educational aim in mind, others broaden this to include any resource which may potentially be used for learning.
- **Level of openness:** Most definitions require that a resource be placed in the public domain or under a fully open license. Others require only that free use to be granted for educational purposes, possibly excluding commercial uses.

These definitions also have common elements, namely they all:

- cover use and reuse, repurposing, and modification of the resources;
- include free use for educational purposes by teachers and learners
- encompass all types of digital media.

Since OER are intended to be available for a variety of educational purposes, *most* organizations using OER neither award degrees nor provide academic or administrative support to students seeking college credits towards a diploma from a degree granting accredited institution. [19][20] In open education, there is an emerging effort by some accredited institutions to offer free certifications, or achievement badges, to document and acknowledge the accomplishments of participants.

In order for educational resources to be OER, they must have an open license. Many educational resources made available on the Internet are geared to allowing online access to digitized educational content, but the materials themselves are restrictively licensed. Thus, they are not OER. Often, this is not intentional. Most educators are not familiar with copyright law in their own jurisdictions, never mind

internationally. International law and national laws of nearly all nations, and certainly of those who have signed onto the World Intellectual Property Organization (WIPO), restrict all content under strict copyright (unless the copyright owner specifically releases it under an open license). The Creative Commons license is the most widely used licensing framework internationally used for OER.

## Advantages and disadvantages

### Advantages of using OER include:

- Expanded access to learning – can be accessed anywhere at any time
- Ability to modify course materials – can be narrowed down to topics that are relevant to course
- Enhancement of course material – texts, images and videos can be used to support different approaches to learning
- Rapid dissemination of information – textbooks can be put forward quicker online than publishing a textbook
- Cost saving for students – all readings are available online, which saves students hundreds of dollars

### Disadvantages of using OER include:

- **Q**uality/reliability concerns – some online material can be edited by anyone at anytime, which results in irrelevant or inaccurate information
- Limitation of copyright property protection – OER licenses change "All rights reserved." into "Some rights reserved.",so that content creators must be careful about what materials they make available
- Technology issues – some students may have difficulty accessing online resources because of slow internet connection, or may not have access to the software required to use the materials

### OER and E-learning

The Indian education system has been consistently evolving over a while. Online learning has added more benefits to the current education system. During the launch of the 2020-21 financial year budget, the government announced the new education policy, which showed the vital role played by online education.

Online Educational Resources often have a close connection with e-learning. E-learning is not only a technology but also a collection of various

pedagogies to learn and teach. It can also incorporate OER as a pedagogy that can facilitate quality learning. The main benefit of the OER is that it is freely accessible for both students and teachers. Apart from attending the classes online, students can use these OERs to gain more insights into a particular topic. With changing times and technology, distance education is gaining more popularity. The National Knowledge Commission has suggested an increase in the number of OERs to address this changing trend.

## Sources for OER

Open educational resources are mainly stored in repositories available through websites. These repositories are responsible for storing and handling the contents. An OER source can be classified based on the type of resources and the type of repositories. Let us look at the types of resources.

### OCW Websites

OpenCourseware websites are generally a collection of free educational materials uploaded on the internet by an institution organized in the form of an online course. These usually contain course syllabi, study materials, lecture notes, tests, and assignments, all in a structured manner. MIT first conceptualized the idea of an OCW by lending all its course material on the internet. This growth accelerated when other institutions adopted the idea.

### OER Websites

OER websites host content from various universities, educational institutions, and freelance tutors in the public domain. It is accessible to everyone. Moreover, the content on these websites is editable, and anyone can upload their content on the platform.

## Type of Repositories

The search for OERs can also take place through its repositories. These repositories contain both resources and metadata handled through the websites. There are three major types of OER repositories –

- Local repository
- External repository
- Hybrid repository

Some examples of OER repositories are –

- OER Metafinder

- Digital Public Library of America
- MERLOT
- OASIS
- NROER; and so on.

## Top Open Educational Resources in India

India adopted the OER movement in the year 2007 after gaining support from the government and other agencies. The Indian OER movement is an effort to digitize the current educational system and enrich students with quality learning procedures. Following are some of the open-access initiatives that have contributed significantly to the development of OERs in India.

### Digital Library of India

This is a collaborative project by 21 institutions in India and currently handled by IISc, Bangalore. It aims to provide access to a digitized collection of various rare non-copyrighted books by multiple authors collected from libraries across India.

### National Digital Library

This is an IIT Kharagpur initiative to bring free access to content in English and other regional languages on a public network.

### Shodhganga

This is a digital repository of theses and journals submitted by doctorates and research students.

### NPTEL

This is a joint initiative by 7 IITs in India supported by the MHRD. It aims to improve the engineering sector in the country by conducting free courses and certified exams. The courses are in video formats taught by IIT professors in various fields of engineering and science.

### Project OSCAR

This is an enterprise of IIT-Bombay which contains a massive repository of animations and simulations based on science and technology. It aims to teach various science concepts to undergraduate and post-graduate students, thereby shaping their careers.

**NCERT**

This is an open resource available on the web, meant for school students and institutions. This is an attempt made by the CBSE body of India. Resources on this website come in three languages; Hindi, English, and Urdu.

**NIOS**

Is an open university that started its own OER project to provide educational materials for the vocational streams.

**Agropedia**

This is the much needed OER of recent times. It has all the knowledge resources about agriculture and its related topics. This OER is directly approved and run under the guidance of the Indian Council of Agricultural Research. It contains the materials in text, audio, and video formats for easy viewing.

Listed above are some of the Open Educational Resources in India sponsored by various institutes across the country. Students can search for more OERs on the internet to learn more and gain additional knowledge about a subject.

**Reasons for using OER**

There are many reasons instructors might want to use OER:

**Free and legal to use, improve and share**

- Save time and energy by adapting or revising resources that have already been creating
- Tailoring educational resources to the specific content for your course
- Expands opportunities for interdisciplinary teaching and learning by allowing instructors to integrate and revise multiple educational resources
- Redefines "traditional" learning by often incorporating multi-media or scenario-based education
- Allows instructor to go beyond the confines of "teaching to the book"

**Network and collaborate with peers**

- Access to educational resources that have already been "peer-reviewed" by other experts in your field
- Many resources have a review or annotation feature so instructors have more in-depth knowledge of the resource and its quality quickly
- Makes learning and teaching more collaborative

**Lower educational cost and improve access to information**

- Reduces the cost of course materials, particularly textbooks so that all students have access and aren't as financially burdened
- Find and access information instantly on virtually any topic, and can access with various devices.
- Gives learners the option of looking at course content openly before enrolling.
- Can reduce the students bear, sometimes increasing graduation and retention rates

**Benefits of using an OER**

As said already, OER is a freely accessible resource found on the Internet. The OER has changed the picture of teaching-learning practices and has numerous benefits. Some of the benefits of using an OER are –

- Students through OER can learn from anywhere in the world with just a smartphone and the Internet.
- OER-based teaching has a wider reach compared to other modes of teaching.
- Textbook-based learning eliminates the use of OERs. Textbooks sometimes provide less information than required. This redundancy barrier in information is overcome by the OER.
- Teachers can minimize their time taken to prepare the course content. The most challenging part of creating an online course is to prepare the course content. Teachers can now directly refer to the OERs available and even prepare a separate course and sell them using an LMS platform.
- Cost efficiency for the students and teachers is very high. They need not spend too much money on buying books for every subject.
- You get access to updated information. Unlike textbooks, users can immediately update the information in OERs.
- Students can get a broader perspective about a subject apart from their regular courses.

## CHALLENGES OF USING OER

There are many benefits to using OER in the classroom; however, there are also some drawbacks. The biggest challenge that instructors face when adopting OER is best encapsulated by the phrase "availability may vary."

### Subject Availability

Many of the largest OER projects funded over the past fifteen years targeted high cost, high impact courses to save students money. Because of this, most of the OER available today are for general education courses such as Psychology, Biology, and Calculus.

This does not mean that there are no OER available for specialized subject areas or graduate-level courses; however, there are more resources to choose from for instructors who teach *Introduction to Psychology* than for those who teach *Electronic Systems Integration for Agricultural Machinery & Production Systems*.

Note: This is beginning to change as more institutions begin publishing OER through regional and institutional grant programs.

### Format & Material Type Availability

As with subject availability, the format and types of OER that have been developed over time have largely been targeted at high enrollment courses which could see substantial cost savings for students. There are many open textbooks available today, but fewer options for ancillary materials. You can find lecture slides, notes, and lesson plans online, but ancillary content such as homework software and test banks are harder to find.[11]

### Time & Support Availability

Although the other challenges to OER use are inherent to the resources themselves, this final drawback is a concern for you as a user and creator. It takes time and effort to find OER that might work for your course, and if you want to create and publish new resources, that takes exponentially more time.

Time constraints are always going to be an issue for instructors who want to try something new in their course. Luckily, there are resources available to help you locate, adopt, and implement OER. Contact your local OER expert on campus or your subject librarian if you need support.

## Important Features of OER

OER can take many forms, such as: syllabi, lesson plans, videos, software, tests, teaching techniques, group activities, writing prompts, textbooks, learning modules, experiments, simulations, and course designs. There are no platform restraints.

## Important Features of OER

- OER can either be in the public domain, or under a more lax intellectual property license.
- OER can be revised, remixed, added upon, translated, and then shared again to meet different needs.
- OER can take many forms, such as: syllabi, lesson plans, videos, software, tests, teaching techniques, group activities, writing prompts, textbooks, learning modules, experiments, simulations, and course designs. There are no platform restraints.

## Conclusion

In this paper, we have presented the OER and its repository. Here it indicates that the popular OERs basically cover all the categories, with all languages being the most popular. In terms of material type, open textbook and video are the most popular. Furthermore, websites are the most popular technical format – i.e., this is the 'medium' by which users prefer to access OERs. It provides valuable insights into the design of OERs, in terms of content quality, effectiveness as a teaching/learning tool and ease of use. Finally, we can say that OER is an Innovative strategy/pedagogy for teachers and, students can also play an important role in using of OERs through different learning activities.

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# Modern Teaching, Learning and Techniques in library Professional

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**Abstract**:

*In the age of modern technology it is essential to have a change in the teaching techniques adopted in Indian education, system. Due to dependence on lecture system in teaching techniques, monotony in education has grown, which has had its adverse effect on the curiosity and creativity in students. The science and technology has moved way ahead but we continue to teach out-dated concept to students. According to a criticism of education system done on the basis of government and private surveys, graduates are not entitled to jobs as they do not have time and again suggested new teaching techniques which have the peculiarities of self-study, self- understanding and analysis's. The effectiveness of these modern teaching techniques can grow many folds if they are supplemented by modern library services. The present paper discusses teaching techniques and supportive role of academic libraries.*

**Keywords** - *Teaching, project, Resource, Surveys Knowledge's, growth, Technology*

**Introduction:** - The currant education system focuses more on teaching than on learning. One education system puts more emphasis on direct teaching instead of making students to learn on their own, encouraging them to imbibe skills and helping them solve their problems while learning. Out-dated learning and exam culture still force the students to memorize by rote readymade notes or text books, with no comprehensions of basic concepts. Indian Universities largely employ lecture system. According to the 2016 survey of web metric ranking of World Universities 33% Engineering graduates failto land a job. Others have to work on a modicum of salary. A survey by Economic Times finds that Indian universities have lagged behind in world rankings. Consequently, students with Engineering and MBA degree do not qualify for job. The situation is grimmer for arts, science and commerce students, In view of this, it is expected to have changes in educations system relevant to change in time It is taking place to a certain. This study discusses how libraries can play a positive role in the changing times.

These teaching technique's should not be confined to engineering or management courses also as they also prove useful to Arts, Science, Commerce and Humanities, curriculum. Though on a limited basis the efforts however have begun to include the in study teaching system in all aforementioned learning streams, thanks to the availability of technology. The academicians are also making effort to implement the concept of constructivism even at school level. In such a changing a scenario, the role of libraries is going to assume importance.

**Zero Lecture Project:** Learning is developing called Zero Lecture Project or Project-based teaching, it attempts, through libraries, tointroduce students to finding information sources and using them. Project-bead learning also involves techniques like dividing students into small groups and providing them information related to the given topic, encouraging them to us reference books like encyclopaedias, dictionaries, thesauruses for complete comprehension of the concepts, making available a list of articles related to the topics, published in periodicals, subject journals and books.

**Classroom:-**

A Flipped Classroom is one where information is collected outside the classroom using various resources and the compiled information in then converted into knowledge in the classroom Flipped classroom is an instructional strategy and a type of blended learning that reverses the traditional learning environment by delivering instructional content, often online, outside of the Classroom. "This concept expects students to collect information from various sources and come well prepared in the classroom. Students expected to compile information by syllabus-based videos presentations of experts on the related topic and audio clips or through video conferencing or through research papers of the conferences. Here, libraries can provide aforementioned various information sources to students. A flipped classroom enables students to get resolved through teachers all their doubts, problems arising while preparing for a topic. Nowadays a college library is equipped with computers, Internet, LCD Projectors and reprographic machines. Using these modem technologies to their fullest, the concepts of a flipped classroom can easily be implemented with the active participation of libraries.

**Design Thinking in Teaching:** In this teaching technique, students are expected to do case studies in order to find a way out from the problems arising while doing the actual work. The availability of cases concerning the topic given to the students in library proves useful in this teaching method. While providing necessary information to the students through the library for having proper understanding of the problems, their analysis and solution, the libraries can also provide facilities for

group discussion. With such kind of services, the indispensability and utility of library services in teaching method can be ascertained.

**Online Learning Tools and Techniques:** In order to create interest in students about their subject, use of online learning tools by libraries becomes essential. Online quiz, guide maps, flash cards not only help evaluate the knowledge of students but also groups of students who are members of the library can also be formed for exchange of knowledge about their subject and settlement of doubts and problems. This enables them to get in-depth knowledge of their subject.

**Role of Social Media:** At present, social media seems to be playing the role of social teachers. As such, it is vitally important for libraries to make their member students aware of the utility of social media. If used positively, social media can provide in-depth knowledge of the concerned subject to the students. This can be proved from the example of a student who acquired in-depth knowledge of English through Brazil Academy of Languages.

**Innovation and Research:** While commenting on the reasons, why our students are not complete or updated in their subject, Human Resource minister Mr.PrakashJawdekar express that teaching technique should be such as, it would create questions in the minds of students. Student should have adequate time and arrangement to find solutions to their questions." New concepts emerge from the questions. Libraries could be means of providing apt solutions to the student's questions. Iflibrary services like current awareness service and selective dissemination of information are implemented with more efficiency, the curiosity of students can be satisfied.

**Skill based Education and Libraries:**Jetking Inflate Vice president Siddhartha Bhavani has said that the eligibility bag employment opportunities could be obtained through skill-based education, provided students put emphasis on self-study. Lack of knowledge of basic concepts in students is the major hurdle in securing employment opportunities. This apart, traditional education system does not pay much attention to developing consumer dealing skill, communication skill and decision making power. With the information sources available in libraries in libraries, all these skills can be acquired through self-study.

**Start-up Concept in Libraries:** The Govt. of India has launched Start-up scheme for new entrepreneurs. The Government of Maharashtra too has started promoting and propagating this scheme from different platforms in order to enable collegiate students to take its benefit. Collegiate libraries can support this scheme. They can produce a good folder giving complete information about the scheme, action plan,

opportunities of start-up industries, compilation of the experiences of experienced industrialists, facilities given by the government, financial aid, etc. Students are going to make inquiries on a large scale to university and collegiate libraries. The basic principle of start-up scheme is to have novel ideas and develop it. For the creation and emergence of these new ideas, modern and well equipped libraries can act as right centre.

**Conclusion:** To review the education system, surveys are constantly conducted by various institutions and government. The common inference drawn from all these surveys is that the knowledge of our graduate students is not adequate fetch themi them employment or jobs. This situation has arisen due to over reliance on. Lecture system. Further, the extents to which changes ought to have taken place in teaching techniques have not taken place. Various academicians have suggested developed systems of teaching techniques laying emphasis on self-study by students. The necessary information sources required for self-study are available in libraries, making use of library services for students. caneasily acquire necessary skills through self-study. Thus, in modern teaching techniques, libraries can play a central role. This fact is underlined through this inference.

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# Need of Open Educational Resources (OERs) in Higher Education: **A Bird`s View**

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## Abstract

*With remarkable developments in ICT, the present education system has been enhancing by various educational materials in electronic form, which may be called as Open Educational Resources (OERs).Open Educational Resources are educational materials and resources offered freely and openly for anyone- to use and under some licenses to re-mix, improve and redistribute and they Open Educational Resources are teaching, learning and research materials in any medium – digital or otherwise – that reside in the public domain or have been released under an open license that permits no-cost access, use, adaptation and redistribution by others with no or limited restrictions. The present paper mainly focused aboutvarious types of OERs and its impact on higher education. The initiatives of OERs established in India as well at global level,aiming at proper utilization of ICTs are also highlighted. The paper also discusses the role of OER's in higher educational institutions.*

**Key words:** Higher Education**,** ICT, OERs,Open Access (OA),

## Introduction:

Information and Communication Technology (ICT) has affected almost all spheres of life. ICT can be considered as a modern skill of Science to store, use, manipulate and process data. The role of ICT cannot be refused in education as information needs are increasing day by day. In the present digital era every individual desires to be information oriented and has seriously influenced the education sector as well. It has speeded up the information dissemination as it has

conquer the barriers that earlier existed for the dissemination of information. Open Access (OA) has influenced and served the basic need of dissemination of information on a large scale. According to Loan (2014) OA is the primary thing to access the information on the global level, OA is a new way that is used to describe the manner in which information is accessed free of cost, it refers to the availability of information on internet accessible on a public platform.

Open Educational Resources (OER) had huge impact since the Massachusetts Institute ofTechnology (MIT) started publishing educational resourcesonline as OpenCourseWare (OCW) in 2001. In 2007, theOCW Consortium was formed; since then, more that 300institutions have joined in the consortium. The OCW Consortium, now renamedas Open Education Consortium, is the biggest internationalOER organization, later many such OER initiatives are initiated in international level as well as in India.

## Open Educational Resources (OERs)

The term Open Educational Resources (OER) first came into use at a conferencehosted by UNESCO in 2002, defined as "the open provision of educationalresources, enabled by information and communication technologies, forconsultation, use and adaptation by a community of users for noncommercialpurposes" (Johnstone, 2005). The definition of OER now mostoften used is: "open educational resources are digitized materials offered freely and openly for educators, students and self-learners to use and reusefor teaching, learning and research". To clarify further, OER is said toinclude:

- **Learning Content:**Full courses, courseware, content modules, learningobjects, collections and journals.
- **Tools:** Software to support the development, use, reuse and delivery oflearning content, including searching and organization of content, content and learning management systems, content development tools,and online learning communities.
- **Implementation Resources:**Intellectual property licenses to promoteopen publishing of materials, design principles of best practice and localize content.

A closer look at the definition shows that the concept of "openeducational resources" is both broad and vague. A wide variety of objectsand online materials can be classified as educational resources, from coursesand course components, to museum collections, to open access journals andreference works. Over time the term has come to cover not only content, butalso learning and content management software and content developmenttools, and standards and licensing tools for

publishing digital resources,which allow users to adapt resources in accordance with their cultural,curricular and pedagogical requirements.

**Re-usability and Discoverability in OER:**

All human beings have the ability to learn, improve andprogress; educational opportunity is the mechanism by whichthat happens. An inherent ethical commitment may follow fromeducational materials that can be electronically copied, reused,adapted and transferred at global levelwith almost no cost. ForOER to enhance the reach of opportunity, two fundamentalconcepts and problems to overcome are reusability and discoverability.Reuseis "the ability to adapt freely and reuse existing piecesof knowledge" that is, to utilize a resource for another aim,usually for a purpose unintended by the original creator. OER*reusability* means that the content is relevant to particular purpose of a user, is technologically accessible, and is adequately open for use, reuse, remixing, adapting, and redistribution. Openeducational digital materials and repositories take a rich diversityof types and representations and are linked to the specificapplication packages used to produce or manage them. They areeasily misidentified and are generally poorly described or annotated;they often have inadequate metadata attached to them to avoid a gradual reduction in their value. OER not only need tobe gathered and stored, but also bemade useful and visible to all.

**Role of Open Educational Resources in Higher Education:**

At present, huge number of higher education institutions worldwide produce, reuse educational resources. The reality is that educational content is becoming more widely available through online and free of cost, leads to the question: What role will colleges and universities play in the future? OER be able to help institutions provide higher education to the rapidly increasing numbers of students and lifelong learners. Traditional colleges and universities, with their experience and status, are in a good position to develop online teaching, learning communities, and certification. Those that produce high-quality knowledge, teaching, and students have little to fear, and much to gain, from Open Educational Resources. This movement has challenged the traditional teaching by employing new ways to deliver high-quality educational content. In this new paradigm for educational content consumption, OER are expected to play a crucial role for learning.

The continuous development of information and communications technologies (ICT) is one of the drivers of the knowledge economy. Technology continues to gain ground in higher education and has already enhanced the on-campus student experience, through student portals, Internet access, digital

libraries, and the availability of laptops, handhelds and other portable devices. E-learning is becoming part of the mainstream of educational programmes. Technological developments open up new path and pose financial, technical and qualitative challenges to higher education. The role of e-learning is growing, in terms both of courses offered fully online or as blended learning and of quality of students' learning outcomes, which seem to be as good, or even better, than in face-to-face teaching.

**Open Educational Resource Initiatives in Higher Education:**

The open educational resources movement is growing in the higher education at global level. Around the world,at present, over 2500 open access courses are available from over 200 universities: Example: In United States 1700 courses are available by seven university-based projects (http://ocw.mit.edu/, http://cnx.rice.edu/, http://www.cmu.edu/oli/, http://ocw.jhsph.edu/, http://ocw.tufts.edu/, http://ocw.usu.edu/, http://ocw.nd.edu/,). In China 451 courses are available by 176 universities of the China Open Resources for Education (CORE) consortium. (http://www.core.org.cn/cn/jpkc/index_en.html). In Japan 350 courses are available by ten universities in the Japanese OCW Consortium (http://www.jocw.jp/) and in France 178 courses are available by eleven member universities of the ParisTech OCW project (http://graduateschool.paristech.org/)

More open educational resource projects are promising at educational organisations in Australia, Brazil, Cuba,Canada, Hungary, India, Ireland, Iran, Netherlands, Portugal, Russia, Spain, South Africa, Thailand, United Kingdom, United States and Vietnam and many more countries.

**OER Initiatives in India:**

India embraced OER by the year 2007, with support from Indian government and external funding agencies (James &Bossu, 2014). India is an active player in the open access movement with a huge number of open access e-journals, open access repositories and open source software-based digital repositories. Some of the open access initiatives have contributed largely to the creation, utilization and expansion of OERs in India. Some of them are listed below:

1. **National Programme on Technology Enhanced Learning (NPTEL):** It is a Government of India initiative a project funded by Ministry of Human Resource Development (MHRD). The initiative was started in 1999 with a prime aim of developing and enhancing the basic knowledge of science and engineering with the help of multimedia and the internet. The main motive of NPTEL is to empower students and prepare them for competition on global level. NPTEL is a joint initiative by the IITs and IISc in 2003.

NPTEL provides web and video courses through online in all the engineering, science and humanities. There are more than 800 video courses are available in the database from all the engineering disciplines.

2. **National Digital Library** (NDL):is an initiative of IIT Kharagpur and aims to offers free access to educational content in digital format in English and other major Indian languages on a single platform. The project started in the year 2015, and aims to fetch under its fold 100 educational institutes and provide access to a collection of one million digitised books and journals in the first phase.
3. **SWAYAM** (Study Webs of Active-Learning for Young Aspiring Minds): This is an initiative by MHRD, to offer free Massive Open On-line Courses (MOOCs) on all types of subjects. It is an Indian open source platform based on Open edX for providing blended MOOCs in native Indian languages. Microsoft has been selected as the technical partner for the project. Online courses on SWAYAM platform shall be made available by various partner institutions identified by the National MOOCs coordinator. The project aims to launch 2,000 massive open online courses (MOOC) for over 30 million students this year.
4. **Shodhganga**:is a digital repository of Indian theses and dissertations, set up by Government of India and INFLIBNET (Information and Library Network)Centre in 2010. This repository provides easy access to theses and dissertations submitted in all the Indian universities by all thedoctoral and other research scholars.
5. **Consortium for Educational Communication** (CEC): Consortium for Educational Communication(CEC) is one among the inter university Center set up by the University Grants Commission (UGC).CEC has beenprimarily set up to cater the needs of higher education by the use of powerful television media alongwith appropriate use of Information and Communication Technology. CEC offers educational programs in different subjects with the coordination of 21 media centres.
6. **e-Gyankosh**: e-Gyankosh is a national knowledge digital repository meant to store, index, preserve, distribute and share the digital learning resources developed by all educational institutions in India. This repository provides online access to around 3000 courses of IGNOU and 2,000 video lectures. The items in e Gyankosh are protected by copyright. The course material is available in PDF format that is downloadable freely. Resources can be accessed through one time registration. It provides access to videos.

7. **Project Ekalavya**:This is an open source educational initiative by the Indian Institute of Technology, Bombay, for content development in all major Indian languages. It is intended to provide an interactive platform for the creation, inclusion, dissemination and usage of knowledge. The project provides innovative channels of communication between the seekers and givers of knowledge.It is manifested in several programmes like eGuru (providing online mentorship to engineering students), eOutreach (repository of high quality educational material) and eContent (providing quality content in Indian languages).
8. **National Mission on Education using Information and Communication Technology** (NMEICT):NMEICT was launched by the Ministry of Human Resource and Development (MHRD) in 2009. Its web portal is Sakshat — that provides access to e-content, e-journals and e-books. The aim is to leverage the potential of ICT, in providing high quality personalized and interactive knowledge modules over the internet/intranet for all the learners. All educational materials are offered under Creative Commons license.
9. **Vidyanidhi:**This is an open access Institutional repository, initiated in April 2013, aims to gather all scholarly publications including journal articles, conference papers, book chapters, book reviews, project reports and patents from the establishment of the university in 1916.The repository can be accessed by anybody from anywhere, submission of documents to this archive is limited to University of Mysore research community. Interested users can freely download and use documents as most of them are directly accessible and full-texts downloadable, if the publication is in open access or if their institution has the accessibility to the concerned journal/publisher. 'Request Copy' forms can be used for documents to which direct full-text download is restricted due to publisher embargo.
10. **National Repository of Open Educational Resources** (NROER):NROER is initiated by Ministry of Human Resource and Development (MHRD) and Central Institute of Educational Technology (CIET), National Council of Educational Research and Training (NCERT), is a learning repository for open educational resources. The repository offers a platform for creation and use of localised content available in multiple formats. The repository provides digital resources such as videos, audio, images, interactive media, wiki pages and documents, for all school subjects in multiple languages.
11. **E-PG Patshala**: This is an initiative of UGC for providing free access to standardized e-textbooks for postgraduate courses in different universities of the country under the canopy of National Mission on Education through

ICT (NME ICT) has assigned UGC a assignment for the development of e-content in 77 subjects of postgraduate level. The EPatshala covers lots of subjects in its broad spectrum across the disciplines of Arts Humanities, Languages, Engineering and Technology, Life Science, Medical and Health Science, Physical and Basic Sciences, Social Science. It strongly advocates "Massive Open Online Course"(MOOCS).

12. **National Council of Educational Research and Training** (NCERT):NCERT is meant for providing school textbooks and reference books online through its website to offer easy and free access by teachers and learners.The books are in English, Hindi and Urdulanguages. The e-books are available as flipbooks and can also be downloaded on the mobile phones. The material is provided under copyright notice with restrictions on further distribution and re-use.
13. **National Institute of Open Schooling** (NIOS):NIOS has taken up an OER project for providing easy access to educational materials for Vocational programs at the level of Secondary and Sr. Secondary levels. The project is carried out in partnership with state level institutions and organizations.

**Advantagesanddisadvantages of OERs:**

The OERs have provided opportunities for changing teaching-learning practices. New collaborative learning practices are emerging. The easy and free availability of quality materials facilitates the educators towards developing and learning new pedagogical models. Certain advantages of OERs in educational systems in developing countries as cited by Kanwar, Kodhandaraman, and Umar (2010) include:

**Advantages:**

- helping developing countries save course content development time and money,
- addressing the digital divide by providing capacity-building resources for educators,
- improving educational quality at all levels.
- facilitating the sharing of knowledge,
- helping to preserve and disseminate indigenous knowledge, and;

**Disadvantages:**

- Technical barriers such as lack of broadband access.

- Economic barriers such as inadequate resources to invest in the required hardware and software.
- Legal barriers such as the time and expense associated with gaining permission to use.
- Policy-oriented barriers such as the lack of clear policy in institutions regarding OER.
- Social barriers such as a lack of the skills needed to use technology.

**Conclusion:**

The OER phenomenon has revolutionized the way information is used and disseminated. Open Educational Resources (OER) make an important contribution to the diversified supply of learning resources to the global community of learners. It has led to an emergence of creative participation in the development of digital content in the entire education sector. Institutions with better access to ICT infrastructure will make more use of open resources rather than those lacking adequate infrastructure. So for ensuring equitable access to open resources, equitable access to technology is must. A number of innovative initiatives aimed at providing easy access to educational resources have been taken up. Many Open Universities have taken up initiatives to make their educational resources available in the public domain. However, OER practices in India are currently in an initial stage of development and a number of issues need to be considered. But the potential for growth of the OER phenomenon in India cannot be denied and more such initiatives should be encouraged in the open and distance learning systems in India.

**Suggestions:**

The Open educational resources (OER) are freely accessible, openly licensed text, media, and other digital assets that are useful for teaching, learning, and assessing as well as for research purposes. There is no universal usage of open file formats in OER. The term OER describes publicly accessible materials and resources for any user to use, re-mix, improve and redistribute under some licenses. The NEP-2020 has given more importance to Open Educational esources, so, all the higher educational institutions need to establish digital libraries, to facilitate all types of electronic information resources to needy people like, academic fraternity, scientists, and also research fellows as per their need. The governments, research organizations and other funding agencies need to allocate a special financial assistance, to reach the needy e-information, unreached in the present global scenario.

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# Swayam - The Online Platform for Lifelong Learning

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**ABSTRACT**

Education, while being enjoyable, should help us to broaden our horizons by equipping us with the knowledge necessary to better understand our surroundings as well as succeed in today's world. *Education should allow you to discriminate between good and bad ideas, which gives you a space to argue with or play with ideas so that you can test how they fit with your world. Education is the single* most important key to prosperity and a better future.*There are several challenges to giving quality education such as Infrastructural constraints, Technological issues, the escalating cost of the training &coaching, and ethnic diversity which makes it difficult to offer education tailored to a specific segment. An educational system accompanied by online elements should present a unique opportunityto solve a swarm of challenges in quick time at an affordable budget for which theMOOCs which are Massive Open Online courses are a boon to the field of education. MOOCs are courses delivered online and accessible to all They are known as "Massive" because enrollments are unlimited and can run into hundreds of thousands, "Open" because anyone can enroll — that is, there is no admission process and are delivered via the internet. One of the best platforms which are offering MOOCs is SWAYAM which is the World's largest Online Free E-Learning Platform Portal which enables millions of learners to unlock their potential and become changemakers.*

**Keywords**: *Education, Massive Open Online Courses (MOOCs), SWAYAM, Online Learning, Digital literacy,*

## INTRODUCTION

There is a difference between Traditional Campus Learning and online study. Traditional campus learning has some Admission Prerequisites where Students can have direct contact with faculty which would help to clarify their doubts instantly. Traditional campus learning follows a structured timetable and gives access to libraries and research materials whereas Online study gives more flexibility in one's schedule which helps one to deepen their self-discipline who can connect with classmates from all over the world. Commuting to the physical location can be avoided in online study.

One of the fine examples of online study isMOOCs which can be either commercial or noncommercial. Some of the notable providers of MOOCs are:

| Provider | Type | Institutional participants | Coverage |
|---|---|---|---|
| Academic Earth | Non-Commerical | • Massachusetts Institute of Technology<br>• Stanford University<br>• University of California, Berkeley | Accounting<br>Business<br>Management<br>Marketing<br>Education<br>Psychology |
| Coursera | Commercial | • Stanford University.<br>• Princeton University<br>• Arizona State University<br>• University of Maryland<br>• College Park | Arts and Humanities<br>Business, Information Technology.<br>Lifescience and<br>Social Science |
| edx | Commercial | • Massachusetts Institute of Technology and<br>• Harvard University | Humanities,<br>Business, Management, Computer Science and Environmental Science |
| Udacity | Commercial | • Georgia Institute of Technology<br>• San Jose State University | Data Science<br>Data Analytics,<br>Software Engineering, and Virtual Reality |
| SWAYAM | Non-Commercial | • AICTE<br>• NPTEL<br>• UGC<br>• CEC<br>• NCERT<br>• NIOS<br>• IGNOU<br>• IIMB<br>• NITTTR | Engineering<br>Humanities<br>Management<br>Science |

## Advantages of MOOCs

- MOOCsenvisage a world where anyone, anywhere, anytime has the power to transform their livesthrough learning.
- MOOCs are courses delivered online and accessible to all.
- MOOCscontent are advocated by top professors
- The enrollments are massive and can run into hundreds of thousands.
- Access to the course is free of cost.
- MOOCs teach a specific subject.

## SWAYAM

Under the 'Digital India' Initiative of the Government of India, one of the thrust areas is offering 'Massive Online Open Courses (MOOCs)'. Ministry of Education, Government of India has embarked on a major initiative called 'Study Webs of Active Learning for Young Aspiring Minds" (SWAYAM) which is anInformation Technology platform that hosts Massive Open Online Courses (MOOCs) and provides high-quality education on various subjects from school level—class 9-12 to Post Graduate students covering all disciplines. It was launched on 9th July 2017. Professors of centrally funded institutions like IITs, IIMs, central universities offer online courses to citizens of India. It is designed to achieve the three cardinal principles of Education Policy viz.,

- Access
- Equity
- Quality



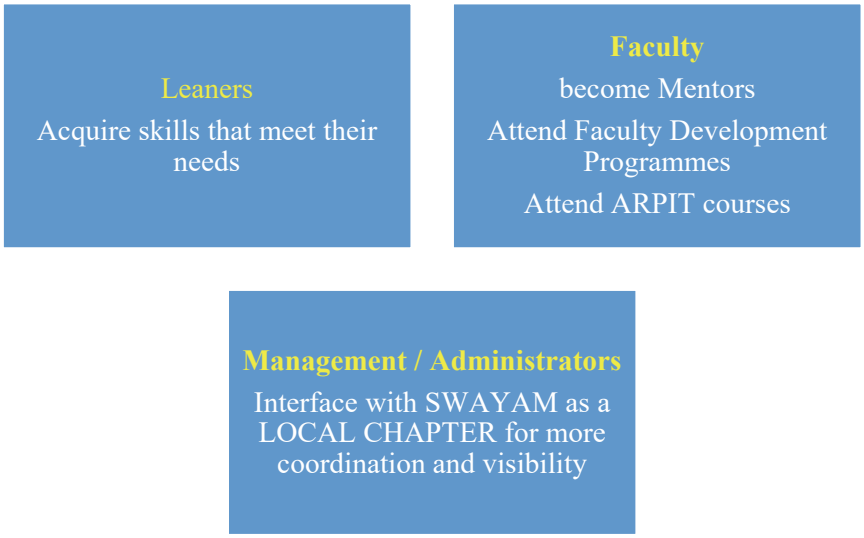

## OBJECTIVES OF SWAYAM

The very objective of this effort is to take the best teaching-learning resources to all, including the most disadvantaged. SWAYAM seeks to bridge the gap between the students who are not able to join the formal mode of education and those who have remained unexposed to digital education.

## COVERAGE OF SWAYAM

- Curriculum-based course contents
- School education (9-12 levels) modules
- Skill-based courses which cover both post-higher secondaryschool skills (Polytechnics and Industries).
- Professional certification under a unified scheme in the highereducation domain.
- Courses that can meet the needs of life-long learners of IndianCitizens in India and abroad.

## BENEFITS OF SWAYAM




## SALIENT FEATURES OF SWAYAM

**Best-in-Class Instructors** – Professors of centrally funded institutions like IITs, IIMs, central universities offer online courses to citizens of India which are considered to be of high quality which would help to empower the learners with knowledge and skills.

**Weekly Assignments -** The learnershave to submit the assignments every week in order to ensure the learner's progress in a timely manner

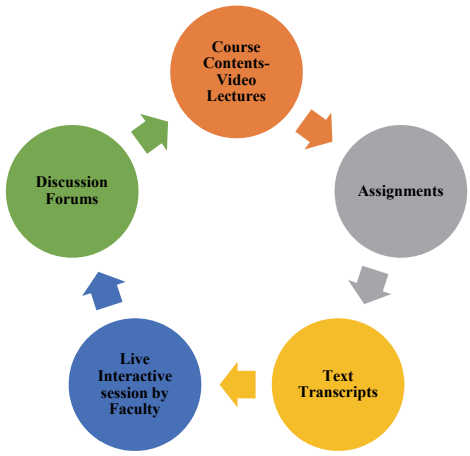
**Proctored Exams** – Examinations are conducted by the National Testing Agency which enhances the effectiveness of MOOCs

**Easy Credit Transfer –** Credit Transfer is possible for courses done in SWAYAM which is channelized through our authorized partners.

**Active Local Chapters** – These chapters are establishedin educational institutions to balance the learner's academic progress and programme

Systematic Approach – Facilitates the learners towards achieving desired learning goals.

## COMPONENTS F A COURSE IN SWAYAM



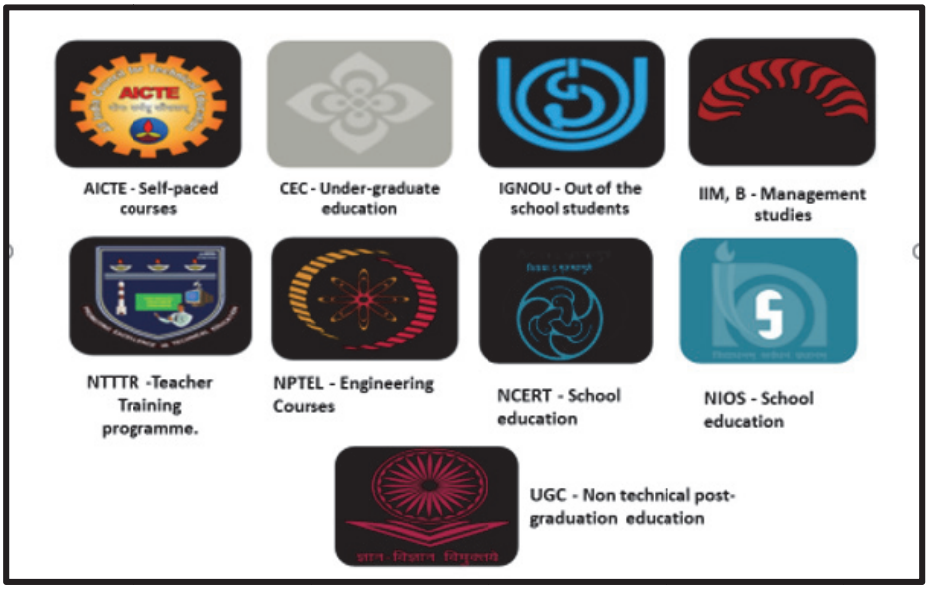

## DURATION OF THE COURSES

The duration of the courses in SWAYAM may be of :

- **4 weeks**
- **6 weeks**
- **8 weeks**
- **12 weeks**
- **15 weeks**
- **16 weeks**
- **24 weeks**

## NATIONAL COORDINATORS

In order to ensure the best quality content is produced and delivered, nine National Coordinators have been appointed who cater to different levels of education.




## CERTIFICATES

Courses delivered through SWAYAM are available free of cost to the learners, however, learners wanting a SWAYAM certificate should register for the final proctored exams that come at a fee and attend in-person at designated centers on specified dates.Eligibility for the certificate will be announced on the course page and learners will get certificates only if this criterion is matched.

## CREDIT TRANSFER

UGC has already issued the UGC (Credit Framework for online learning courses through SWAYAM) Regulation 2016 advising the Universities to identify courses where credits can be transferred on to the academic record of the learners for courses done on SWAYAM.

## SWAYAMJOURNEY

Logging into SWAYAM can be either using the learner's Microsoft account, Google account for Facebook account, or can make a fresh registration. After the login, the learner can search the catalog where the learner can type the keywords and check the courses available, and depending upon the learner's interest enrollment can be done for a course. After enrollment, all the lectures would be posted in your registered email which the learner is supposed to study and submit the assignments at the end of the week which would also come to the registered email id. Discussionforums are available to clarify doubts. The learner has to

register for the examination in case the learner wants a certificate for which the learner has to pay a nominal fee, write the examination online, and after clearing the examination will get a certificate. In short :

- Register with SWAYAM
- Discover Courses
- Enroll
- Submit Assignments
- Get Clarification online
- Complete your Course
- Register for Examination
- Pay Online
- Write Examination
- Get Certificate

## ADVANTAGES OF SWAYAM

- For any Indian learner, SWAYAM courses are absolutely free of cost for learning but for Certification, a nominal fee has to be paid.
- The courses offered on SWAYAM supplement the teaching-learning process of any Institution.
- Professors of centrally funded institutions like IITs, IIMs, central universities offer online courses to citizens of India.
- A learner can earn credits for completing the course on SWAYAM and these credits can even be transferred to the academic record of the learner.
- Availability of discussion forum to clarify doubts.

## CHALLENGES OF SWAYAM

Major challenges of providing MOOCs lies in the Infrastructural issues like Internet accessibility for accessing the SWAYAM courses, non-availability of computer systems in rural areas, lack of training the learners for digital literacy, lack of training the learners to become tech-savvy, and lack of real-time doubt solution, Assessment tends to consist of Multiple choice questions and offering the MOOC are a costly affair that includes the cost of infrastructure, platforms, content creation, human resources and many more.

## CONCLUSION

SWAYAM is the modern-day quality education platform to educate the mass at minimum cost and effort which offers quality education to all. It is now possible for ANYONE outside the IIT system to be able to do an online certification course from SWAYAM and get a certificate from the reputed institutions like IITs, IIScIn other words, SWAYAM is the Mantra for promoting digital education in India where formal education has always been a great challenge to the underprivileged. Hence it is right to say that SWAYAM is a big boon to lifelong learners who can hone their expertise and skills to reach greater heights.

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# The Impact of Open Access Sources and Open Education Resourceson Library Services – A Study

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## Introduction

The Covid-19 pandemic and the global lockdown has significantly changed the overall lifestyle of the people, and has drastically changed the functioning, operations and expectation of the people. The impact of the change is considerably high on Education sector in view of the closing of the Education Institutions physically. The massive transformation to digitisation, which normally takes a decade, has happened in few months and days. The Education Institutions right from KG to Higher Research were forced to go on onlineand digital. Not everybody is affordable for this giant transformation. Open Access Resources and Open Source Resources supported the less privileged and become popular.Open Educational Resources (OER) is one among the Open Access Resources, Open Source Resource used by higher education institutions.

The major aim of this study is to evaluate the impact on Open Access Resource Library Services among the library users and library staff of the Tamilnadu Dr Ambedkar Law University and its affiliated collages. Hypotheses are framed on the basis of the objectives of the study. The methodology involves collection of data from the library staff of Tamil Nadu Dr Ambedkar Law University and its affiliated colleges. A questionnaire is being formulated to fulfil the objectives and to validate the hypotheses. The collected data was analysed and tabulated to draw inferences and findings. Chi-square was used to test the hypotheses formulated for this study. The author concludes by recommending the best practices in change management.

This study may prove to be useful for the students and the faculty of legal studies for identifying useful and more relevant library services and to understand the awareness of various Open Access Resources, Open Source Resourcelike Open Educational Resources (OER) among the respondents, opinion about Open Access Resources, Open Source Resource. This will help the library users to take them to the next level and to pursue their studies and research in a better manner.

## Open source Resource

The term open source refers to something people can modify and share because its design is publicly accessible. The term originated in the context of software development to designate a specific approach to creating computer programs.

## Open Access Resource and Open Educational Resources (OER)

Open Access Resources like data and datasets, books and articles, including scholarly research articles, research materials etc., that have been made available to the public, free of charge:.

The definition of OER currently most often used is "digitised materials offered freely and openly for educators, students and self-learners to use and reuse for teaching, learning and research". OER includes learning content, software tools to develop, use and distribute content, and implementation resources such as open licences. This report suggests that "Open Educational Resources" refers to accumulated digital assets that can be adjusted and which provide benefits without restricting the possibilities for others to enjoy them.

## The Need

Higher education is facing a number of challenges: globalisation, an aging society, growing competition between higher educational institutions both nationally and internationally, and rapid technological development. OER is itself one of these challenges, but may also be a sound strategy for individual institutions to meet them. The trend towards sharing software programmes (open source software) and research outcomes (open access publishing) is already so strong that it is generally thought of as a movement. It is now complemented by the trend sharing learning resources towards the open educational resources movement.

It accelerates the blurring of formal and informal learning, and of educational and broader cultural activities. It raises basic philosophical issues to do with the nature of ownership, with the validation of knowledge and with concepts such as altruism and collective goods. It reaches into issues of property and its distribution across the globe. It offers the prospect of a radically new approach to the sharing of knowledge, at a time when effective use of knowledge is seen more and more as the key to economic success, for both individuals and nations.

## Change Management

Change management strategies depend on the existing situation of the library, which involves careful planning and formulating change strategies. It may be a process of complete revamping the existing practices or modification of some of the practices. It depends on the levels of changes to be adopted. The responsibility

should be assigned to a separate team which should control supervise and implement the change management. The team should be able to identify the factors responsible for blocks and determine the smooth path to implement the change strategies. While doing so the risks involved should be taken care of and they should strive hard to remove or minimize the risk factors.

## Need for this study

Generally when change management topic is discussed, there is always mention about the resistant of the staff for change management. This instigated the researchers to take up this topic and see whether the library staffs and users have a positive attitude or negative attitude towards OAR / OER change management if it is implemented in their libraries.

## Objectives of this study

- To identify the awareness and opinion of library usershave any impact on OAR / OER and the additional Library services.
- To identify the awareness and opinion of library users have any impact on change management and the additional Library services.
- To define the relation between the opinion of staff member on change management regarding Institution, designation and qualification.
- To define the relation between awareness of OAR / OER and the staff opinion regarding change management.
- To draw inferences from the study and enumerated the findings.

## Methodology

A short questionnaire consisting of eighteen questions was designed and it was distributed among the library staff of Tamil Nadu Dr Ambedkar Law University and its nine affiliated law colleges through Google Form.However, it was possible to collect 128 responses fromthese law institutions. The collected data was tabulated and analysed to draw inferences and findings. Chi-square was used to test the hypotheses formulated for this study.

## Hypotheses

1. $H_{0:}$ There is significant difference among the respondents of different institutions on the awareness of OAR / OER.
2. $H_{0:}$ The Designation of the staff does not have any impact on the awareness of the staff on OAR / OER.
3. $H_{0:}$The type of user does not have any impact on the awareness of the staff on OAR / OER.

4. $H_0$: The qualification of the staff is inversely proportional to the awareness of the staff on OAR / OER.
5. $H_0$: There is no relation between the Experience of Library staff and their opinion regarding change management
6. $H_0$: The Designation of the staff does not have any impact on their opinion regarding change management.
7. $H_0$: The type of users does not have any impact on their opinion regarding change management.
8. $H_0$: The qualification of the staff and their opinion regarding change management are not same.
9. $H_0$: The respondents of different institutions and their opinion regarding change management are not same.
10. $H_0$: The awareness on OAR / OER does not have any impact on the User opinion regarding change management.

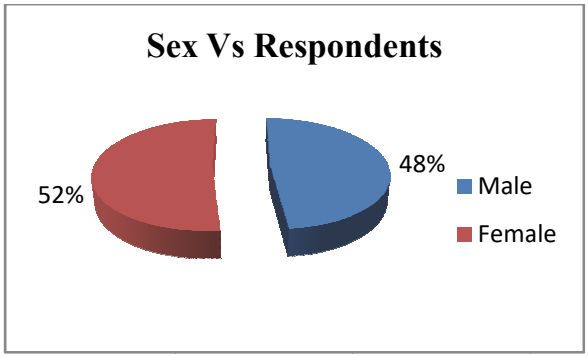
**Table -1**

**Institution Vs. Respondents**

| Sl. No. | University Name | Lib Staff | Users | Number |
|---|---|---|---|---|
| 1 | Tamilnadu Dr. Ambedkar Law University | 8 | 37 | 46 |
| 2 | Dr. Ambedkar Government Law College Chennai | 10 | 19 | 28 |
| 3 | Government Law College, Madurai | 4 | 17 | 21 |
| 4 | Government Law College, Chengalpattu | 4 | 11 | 15 |
| 5 | Government Law College, Tirunelveli | 4 | 14 | 18 |
| | Total | 30 | 98 | 128 |

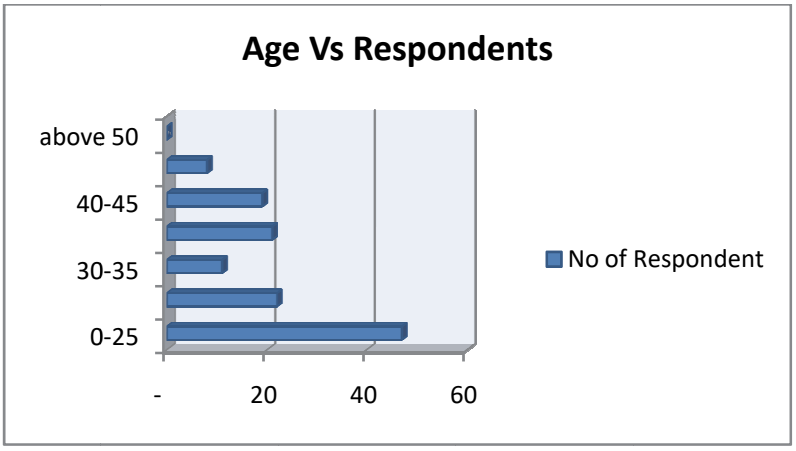
The table 1 presents the distribution of Institution wise various types of respondents. The numbers of respondents are from the Tamil Nadu Dr Ambedkar Law University library, Chennai is the highest, followed by Dr. Ambedkar Government Law College Chennai.

**Chart-1**




From the chart 1, it is found that the male respondents are 48% and the female respondents are 52%. Hence the female respondents are high and the male respondents are low.

**Chart-2**




The respondents age has been grouped and categorised starting with 0-25 years as one category and subsequent categories with increment of 5 years and finally above 50 years as one category. From the chart,2 it is found that majority of the respondents are in the age group of 0 to 25 years followed by 25 to 30 years and 35 to 40 years, and the least are between the age group of 40-45 and 30 to 35 years of age.

**Table – 2**

**Designation Vs. Respondents**

| Sl. No. | Designation | Number |
|---|---|---|
| 1 | Librarian | 5 |
| 2 | Deputy Librarian | - |
| 3 | Assist. Librarian | 3 |
| 4 | Lib. Assistant | 4 |
| 5 | Technical Assistant | 2 |
| 6 | RC | 6 |
| 7 | NMR | 10 |
| | **Total** | **30** |

From the table 2, it is inferred that there are 10 NMR, 6 RC, 4 Library Assistants and 2 Technical Assistants. In the senior level, there are 5 Librarians and 3 Assistant librarians.

**Table – 3**

**User Types Vs. Respondents**

| Sl. No. | User Type | Number |
|---|---|---|
| 1 | Faculty | 18 |
| 2 | Research Scholars | 17 |
| 3 | Post. Graduates | 17 |
| 4 | Under Graduates | 46 |
| | **Total** | **98** |

From table 3 illustrates the different types of library users. It is found that there the 45 respondents from UG and 18 from PG and 16 research scholars and 19 faculties.

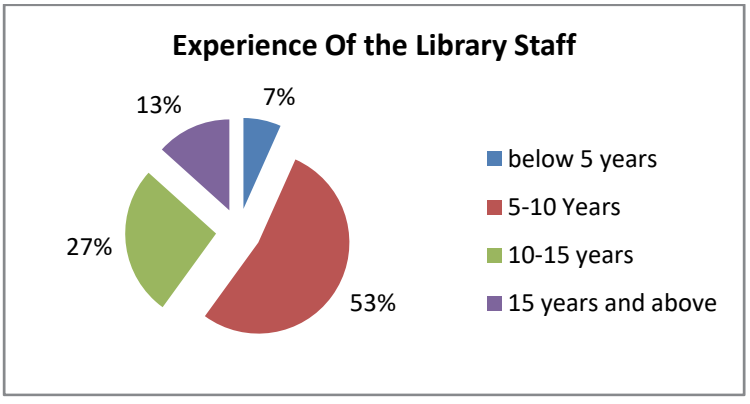
**Table – 4**

**Qualification Vs. Respondents**

| Sl. No. | Qualification | Lib Staff | User | Number |
|---|---|---|---|---|
| 1 | PhD | 4 | 13 | 17 |
| 2 | MPhil | 4 | 16 | 21 |
| 3 | PG | 7 | 23 | 30 |
| 4 | UG | 6 | 46 | 51 |
| 5 | Others | 9 | 0 | 9 |
| | Total | 30 | 98 | 128 |

From table 4, it is found that among the total 30 Library staff members, 8 respondents are highly qualified having MPhil and PhD qualification and 13 are PG, UG and 9 members have other qualifications. With respect Users, 45 respondents are UG, 23 are PG students and 17 are MPhil qualified and 13 are PhDs.

**Chart-3**



The chart 3illustrates that out of the 30 Library staff who have responded majority of the respondents are having 5-10 years of service experience and 8 staff members are having 10-15 years of experience. 4 members are having more than 15 years of experience and another 2 members are having less than 5 years of experience.

**Table – 5**

**Respondents Vs. Change Management Objectives**

| Sl. No. | Description | Yes | No | Total |
|---|---|---|---|---|
| 1 | Willing to take Challenges | 71 | 57 | 128 |
| 2 | Willing to accept and implement new Procedures | 91 | 37 | 128 |
| 3 | Willing to accept changes | 86 | 42 | 128 |
| | Total | 248 | 136 | 384 |

From table, 5 It is interesting to note that majority of the respondents are willing to accept change management objectives. It is found that 71 out of 128 respondents have given positive response for willing to take challenges, 91 out of 128 respondents have given positive response to implement new procedures, and 86 respondents are willing to accept changes.

**Table – 6**

**Respondents Vs.OAR / OERAwareness**

| Sl. No. | Description | Library Staff | User | No of Respondents |
|---|---|---|---|---|
| 1 | Low Awareness | 8 | 17 | 25 |
| 2 | Medium Awareness | 16 | 42 | 58 |
| 3 | High Awareness | 6 | 39 | 45 |
| | Total | 30 | 98 | 128 |

From the above table 6 out of the 30 Library staff member's majority of them have medium awareness on OAR / OER. 8 members have high awareness and 6 have low awareness. With respect to users, a majority of 39 members have high awareness, 42 have medium awareness, and 17 have low awareness on OAR / OER.

The awareness of OAR / OER is high in TNDALU and MLC and the awareness of OAR / OER in other institutions are medium.

**Table-7**

**Institution Vs.OAR / OER Awareness**

| Sl. No. | Description | Low | Medium | High | Chi square Value |
|---|---|---|---|---|---|
| 1 | Tamilnadu Dr. Ambedkar Law University | 0.45 | 2.95 | 2.10 | 5.50 |
| 2 | Dr. Ambedkar Government Law College, Chennai | 2.20 | 0.86 | 0.00 | 3.07 |
| 3 | Government Law College, Madurai | 0.20 | 0.23 | 0.77 | 1.20 |
| 4 | Government Law College, Chengalpattu | 0.00 | 0.21 | 0.31 | 0.52 |
| 5 | Government Law College, Tirunelveli | 0.07 | 0.42 | 0.86 | 1.34 |
| | **Total** | **2.92** | **4.68** | **4.04** | **11.63** |

From table7 it is found that the Chi Square Value is greater than the Table value and the null Hypothesis is rejected. It is proved that there is a significant difference among the Institutions on the awareness of OAR / OER among the staff members. Irrespective of the institutions, the awareness of OAR / OER is Medium among staff members of the institutions and high among the users. Among the institutions, higher awareness is found among the respondents of TNDALU and MLC. Other institutions have medium awareness.

The awareness is high among the higher-ranking staff of the library and it reduces in accordance to the designation. The awareness is low among the low-ranking staff members and NMR Staff.

**Table-8**

**Lib Staff Designation vs. OAR / OER Awareness**

| Sl. No. | Designation | Low | Medium | High | Chi square Value |
|---|---|---|---|---|---|
| 1 | Librarian | 1.33 | 2.67 | 16.00 | 20.00 |
| 2 | Assist. Librarian | 0.80 | 0.10 | 0.27 | 1.17 |
| 3 | Lib. Assistant | 0.00 | 0.35 | 0.80 | 1.16 |
| 4 | Technical Assistant | 0.53 | 0.82 | 0.40 | 1.75 |
| 5 | RC | 1.60 | 2.45 | 1.20 | 5.25 |
| 6 | NMR | 7.04 | 1.02 | 2.00 | 10.06 |
| | Total | 11.31 | 7.41 | 20.67 | 39.39 |

The Chi Square Value is greater than the Table Value. Hence, the Hypothesis is accepted and the null Hypothesis is rejected. It is found that there is significant difference on the awareness of OAR / OER among the library staff members having different designation. Further, the awareness is directly proportional to the higher designation.The awareness (Table 8) is high among the Faculties and under graduates and medium among the PGs and Research scholars.

**Table-9**

**Users Vs.OAR / OER Awareness**

| Sl. No. | Designation | Low | Medium | High | Chi square Value |
|---|---|---|---|---|---|
| 1 | Faculty | 0.51 | 0.09 | 0.03 | 0.63 |
| 2 | Research Scholars | 1.14 | 7.44 | 4.52 | 13.10 |

| | | | | | |
|---|---|---|---|---|---|
| 3 | Post. Graduates | 0.40 | 2.38 | 1.40 | 4.18 |
| 4 | Under Graduates | 2.25 | 7.83 | 3.66 | 13.74 |
| | Total | 4.30 | 17.74 | 9.60 | 31.64 |

The Chi Square Value is greater than the Table Value. Hence, the Hypothesis is accepted and the null Hypothesis is rejected. It is found that there is significant difference on the awareness of OAR / OER among the various user types. Further, the awareness is high among the Faculty and UG and medium among the other users. (Table 9). It is understood that the highly qualified staff have more Awareness on OAR / OER. The Awareness is low among the less qualified staff members.

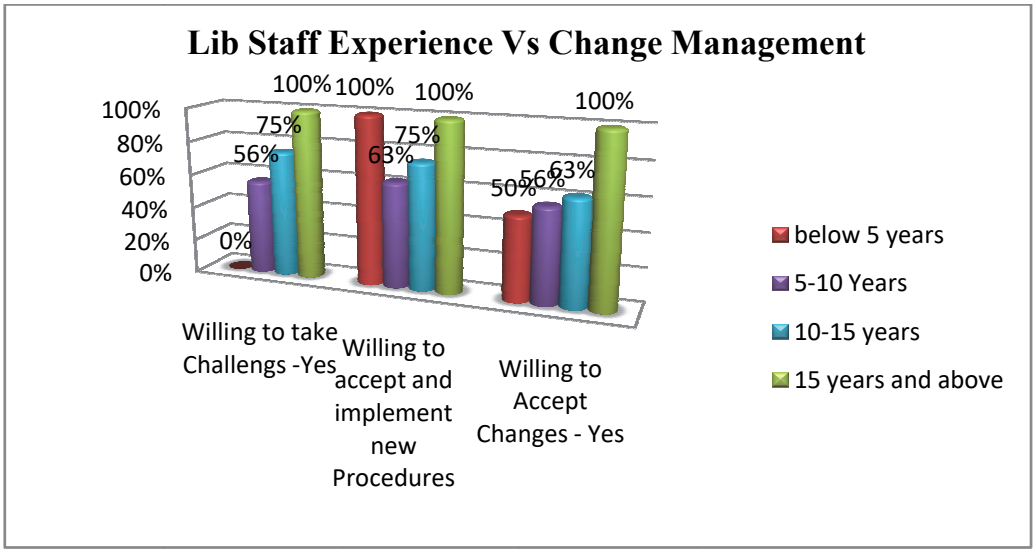
**Table-10**

**Qualification of StaffVs.OAR / OER Awareness**

| Sl. No. | Description Code | Low | Medium | High | Chi square Value |
|---|---|---|---|---|---|
| 1 | PhD | 1.07 | 2.13 | 12.80 | 16.00 |
| 2 | MPhil | 1.07 | 1.63 | 0.80 | 3.50 |
| 3 | MLIS | 0.40 | 0.02 | 0.26 | 0.68 |
| 4 | BLIS | 0.23 | 1.01 | 1.20 | 2.44 |
| 5 | OTH | 5.40 | 0.68 | 1.80 | 7.88 |
| | | **8.16** | **5.47** | **16.86** | **30.49** |

Therefore, there is significant difference on the awareness of OAR / OER based on the Qualification of the Staff members. The qualification is directly proportional to the awareness of OAR / OER among library staff. The higher the qualification the higher is the awareness of OAR / OER. (Table 10)

**Chart-4**




The chart 4 explains that the positive opinion on Change Management is directly proportional to the experience of the Library staff. It is found that majority of the respondents (more than 80%) have given positive opinion of change management having experience above 15 year. The staffs below 5 years have very poor opinion on change management.

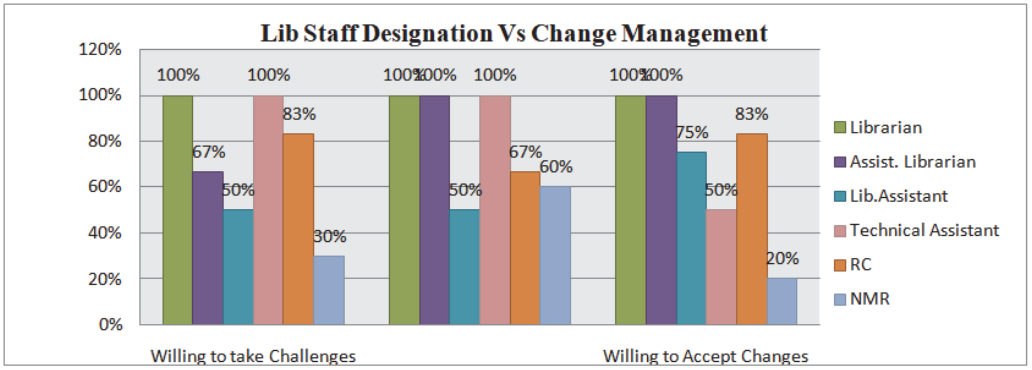
**Table-11**

**Lib Staff Experience Vs. Change Management**

| Sl. No. | Description | Yes | No | Chi square Value |
|---|---|---|---|---|
| 1 | below 5 years | 0.25 | 0.50 | 0.75 |
| 2 | 5-10 Years | 0.50 | 1.00 | 1.50 |
| 3 | 10-15 years | 0.06 | 0.13 | 0.19 |
| 4 | 15 years and above | 2.00 | 4.00 | 6.00 |
| | Total | 2.81 | 5.63 | 8.44 |

The Chi square Value is higher than the table value. Hence the Hypothesis is accepted and it is proved that there is a significant difference among the respondents of the various institutions and their opinion regarding change management. The positive response on change management is directly proportional to the experience of the library staff. Staffs having less than 5 year of experience have very poor opinion on change management.(Table 11)

**Chart-5**




The positive change management opinion is directly proportional to the higher designation of the library staff. The higher-ranking staffs have given positive opinion on Change Management. 100% of Librarians and above 80% of Assist Librarians and Tech Assistants have given positive opinion with regard to Change management Objectives and it reduces in accordance to the designation. (Chart 5)

**Table-12**

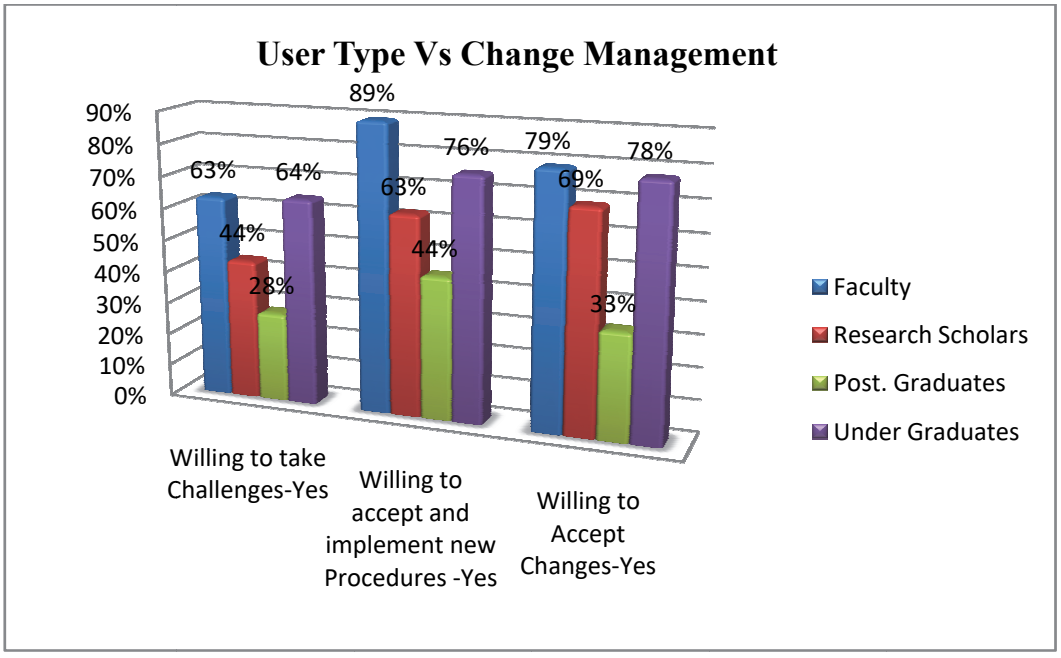
**Designation of Lib StaffVs. Change Management**

| Sl. No. | Description | Yes | No | Chi square Value |
|---|---|---|---|---|
| 1 | Librarian | 2.50 | 5.00 | 7.50 |
| 2 | Assist. Librarian | 0.67 | 1.33 | 2.00 |
| 3 | Lib. Assistant | 0.13 | 0.25 | 0.38 |
| 4 | Technical Assistant | 0.25 | 0.50 | 0.75 |

| | | | | |
|---|---|---|---|---|
| 5 | RC | 0.33 | 0.67 | 1.00 |
| 6 | NMR | 4.05 | 8.10 | 12.15 |
| | Total | 7.93 | 15.85 | 23.78 |

According to the above Chi square Value the hypothesis has been accepted and the null hypothesis is rejects. It is proved that there is a significant difference among the various designations of the library staff and their opinion regarding change management. The higher the designation is directly proportional to the higher the positive opinion on change management.(Table 12)

**Chart-6**




From the chart6 it is found that among the users Faculty, Research Scholars and UG students have given positive change management opinion. PG students have given moderate opinion regarding Change management.

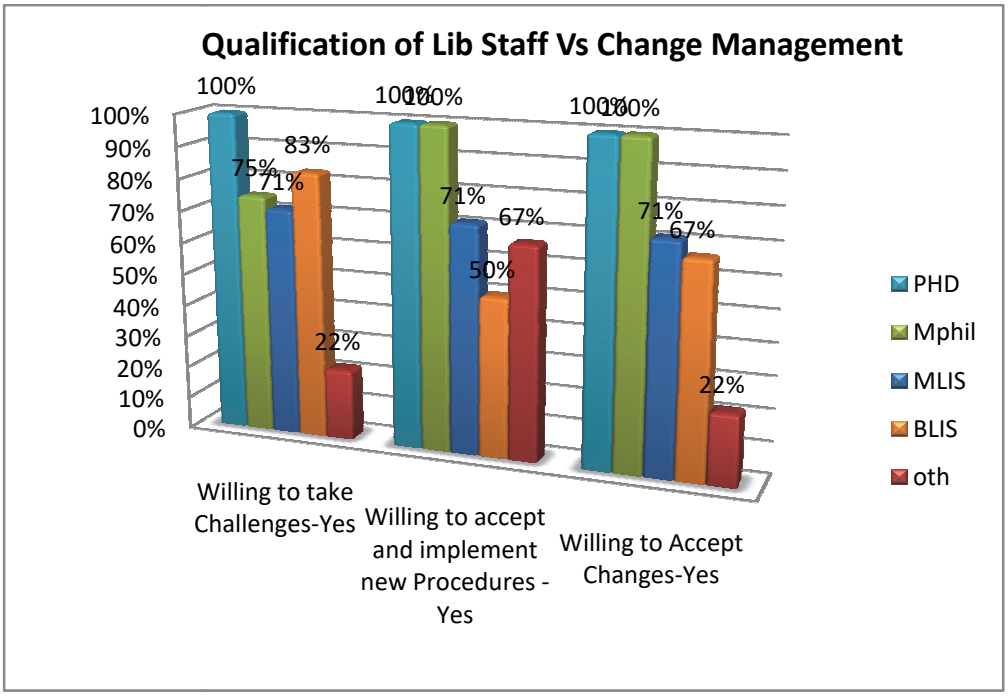
## Chi square Table-13

## User Type Vs. Change Management

| Sl. No. | Description | Yes | No | Chi square Value |
|---|---|---|---|---|
| 1 | Faculty | 1.48 | 2.66 | 4.14 |
| 2 | Research Scholars | 0.26 | 0.48 | 0.74 |
| 3 | Post. Graduates | 7.11 | 12.80 | 19.92 |
| 4 | Under Graduates | 1.45 | 2.61 | 4.06 |
| | Total | 10.30 | 18.55 | 28.85 |

According to the Table 13, Chi, square Value the hypothesis has been accepted and the null hypothesis is rejects. It is proved that there is a significant difference among the Various Types of Users and their opinion regarding change management. The Faculties, Research scholars and UG students have higher the positive opinion on change management.

**Chart-7**



This chart 7explains that majority of the PhD and MPhil qualified respondents have given positive opinion regarding change management and the other respondents has given less positive opinion on change management.

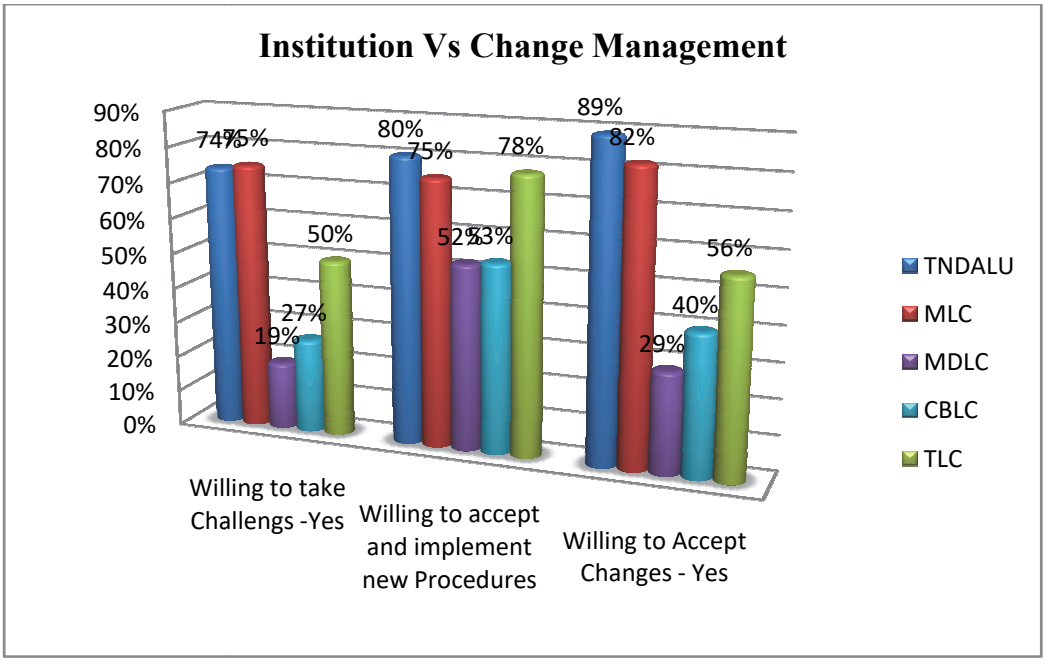
**Table-14**

**Qualification of Lib Staff Vs. Change Management**

| Sl. No. | Description | Yes | No | Chi square Value |
|---|---|---|---|---|
| 1 | PhD | 2.00 | 4.00 | 6.00 |
| 2 | MPhil | 1.13 | 2.25 | 3.38 |
| 3 | MLIS | 0.07 | 0.14 | 0.21 |
| 4 | BLIS | - | - | - |
| 5 | Others | 3.56 | 7.11 | 10.67 |
| | | 6.75 | 13.50 | 20.26 |

From the table 14 it is found that the Chi square Value rejects the null Hypothesis and it is proved that there is a significant difference among the Staff members based on the qualification and their opinion regarding change management. The positive opinion is directly proportional to the qualification of the library staff.

**Chart-8**




The chart 8 explains that majority of the respondents (more than 75%) have given positive opinion of change management in TNDALU and MLC. The other institutions have medium positive opinion on change management.

**Table-15**

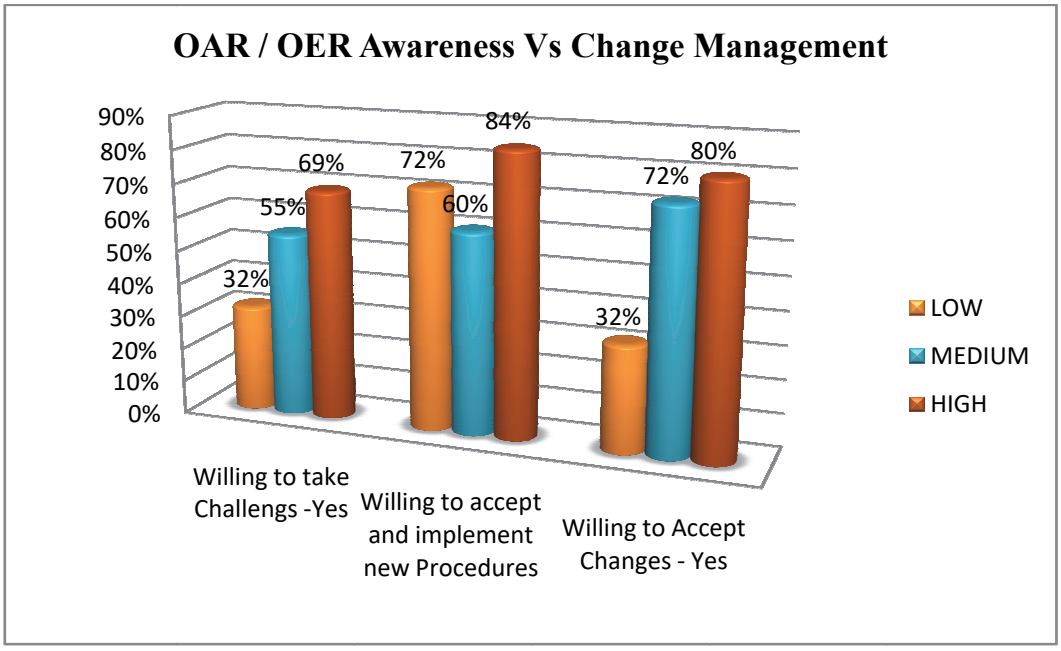
**Institution Vs Change Management**

| Sl. No. | Description | Yes | No | Chi square Value |
|---|---|---|---|---|
| 1 | Tamilnadu Dr. Ambedkar Law University | 5.67 | 10.45 | 16.11 |
| 2 | Dr. Ambedkar Government Law College, Chennai | 2.04 | 3.76 | 5.79 |

| | | | | |
|---|---|---|---|---|
| 3 | Government Law College, Madurai | 9.65 | 17.79 | 27.44 |
| 4 | Government Law College, Chengalpattu | 4.28 | 7.90 | 12.18 |
| 5 | Government Law College, Tirunelveli | 0.12 | 0.21 | 0.33 |
| | Total | **21.75** | **40.11** | **61.86** |

The Chi square Value is higher than the table value. Hence the Hypothesis is accepted and it is proved that there is a significant difference among the respondents of the various institutions and their opinion regarding change management. The response is positive among TNDAUL and MLC and moderately positive among other institutions. (Table 15)

**Chart-9**



From the Chart 9 it is found that the respondents having higher awareness on OAR / OER have given positive opinion on change management. Hence, The Change management opinion is directly proportional to the Awareness of OAR / OER. In general, the response for willing to accept change score is less.

**Chi square Table-16**

**OAR / OER Awareness Vs. Change Management**

| Sl. No. | Description | Yes | No | Chi square Value |
|---|---|---|---|---|
| 1 | Low | 4.40 | 8.12 | 12.52 |
| 2 | Medium | 0.07 | 0.13 | 0.20 |
| 3 | High | 3.53 | 6.38 | 10.91 |
| | Total | **7.96** | **14.68** | **22.63** |

From the table 16, it is found that the null Hypothesis is accepted as the Chi square Value is lower than the table value. Hence it is proved that the awareness on OAR / OER is directly proportional to the Positive opinion regarding change management.

**Suggestions**

- Training to create awareness on OAR / OERis required for lower level library staff in order to build confidence among them. This will in turn help them to change their opinion on willingness to take challenges and willingness to changes.
- Training on awareness on OAR / OER shall be extended to institutions other than Chennai based institutions, where the score is less.
- Library staffs are the mentors for the library users. During the implementation process, the awareness on OAR / OER among Library staff will be very useful to train the users and to clarify the doubts of the users and improve the services of the users.
- After initial training on the trainer program for Library staff,then the training,have to start for the users.

- Change management will be successful when awareness among the users are high, which will build confidence among the team. The confidences in turn create the acceptance of the change among the team members.
- The study finds that all the staff members included in this study do not share the same awareness. Hence the awareness of OAR / OER is essential prerequisite for the implementation of change management. This can be achieved by providing training and orientation programs for the library staff to accept the change management.
- The University Library should try to find various innovative options, utilization of technology to serve and fulfil the requirement of this vast majority of library users.
- The University Library should pursue for various Open Source Study Materials like OER, MOOC, Free & low-cost Online Text books & Learning Materials etc.
- University Library can seek for Open Source Tutorials & Instructional Videos or can create Tutorials & Instructional Videos and upload them on open source platforms for free access to users,
- The university library can also introduce online instructional Technology Games for the benefit of the users.
- The Course Material or Notes provided by the Faculty along with their recorded presentation can be uploaded on these open source platforms for the benefit of everybody.
- This open source online material are available (24/7) without any time restriction and has any location barrier and are easily accessible to users without number restrictions. They require a gadget and internet connectivity only.

## Conclusion

In the current information age and the Covid-19 Pandemic leads the world towards OAR / OER. In order to go along with the tide, the institutions and the respective libraries have to shift and improve the library functions and services towards OAR / OER. Further the OAR / OER is economical for a developing country like India, where a group of institutions will be able to share and optimally utilize the resources through Community Operation and the government itself is encouraging the institutions and allotted substantial funds for the same. Hence, Library professionals have to equip themselves for the eventuality.

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# THEME 2

# Open Access Tools and Services

# Open Access Initiative in National Sanskrit University Library,Tirupati

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***Abstract*:**

*The Open-Access initiative seeks to provide users in the University with equal access to Knowledge and Information. This paper examines the concept of open access initiatives and utilization in the Traditional University. Highlighting the benefits developing university stands to gain from the open-access initiative as well as the obstacles to the realization of the open-access initiative in the developing institutions*.

## Introduction:

Today, in this information society, the free flow of information is a basic principle for bridging the knowledge gaps between information-rich and information-poor communities.Social inclusion and economic empowerment are also achieved in a society where citizens have universal access to information and knowledge, ranging from public information to specialized or customized information related to one's profession, vocation, or culture. Open Access to information and knowledge is a key contributor in provisioning universal access to information and knowledge.

Historically, Open Access support at the National Sanskrit University was adhoc; the study looks at this position, then outlines the changing Open Access Policy in traditional libraries in India and the pressure this placed on our structure. It is then summarized after making changes, outlining the details of the current staff roles, and establishing whether this can be compared with the situation in other University libraries. The study reflected on both the benefits and challenges that the new structure provides.

While Open Access has been supported at the National Sanskrit University from an early stage with the establishment of the university Repository, this work was accommodated within the existing library staff structure. This was a fairly traditional structure for an academic library, with an academic team selecting and recommending resources, monitoring library budgets, and helping staff and students to make the best use of library material. In addition, a Collections Management team was responsible for cataloging, content description, and the discovery and acquisition of print and online resources. The Librarian supported individual faculties and departments.

Open Access is a broad international movement that seeks to grant free and open online access to academic information, such as publications and data. A publication is defined as 'Open Access' when there are no financial, legal, or technical barriers to accessing it - that is to say whenanyone can read, download, copy, distribute, print, search for and search within the information or use it in education or any other way within the legal agreement departments.

**Open Access:**

Open Access is normally defined as a situation where content is made available freely, immediately, and without restriction. The content may then be used and re-used without restrictive copyright and permission barriers. A classic definition of open access is contained in the Budapest Open Access Initiative (2002) statement: "The literature that should be freely accessible online is that which scholars give to the world without expectation of payment. Primarily, this category encompasses their peer-reviewed journal articles, but it also includes any unreviewed preprints that they might wish to put online for comment or to alert colleagues to important research findings. By "open access" to this literature, we mean its free availability on the public internet, permitting any users to read, download, copy, distribute, print, search, or link to the full texts of these articles, crawl them for indexing, pass

them as data to software, or use them for any other lawful purpose, without financial, legal, or technical barriers other than those inseparable from gaining access to the internet itself."

**Benefits of the Open Access**:

- Wider Access
- Increased citations and impact
- Increased visibility
- Drives research innovation
- Faster availability and searchability

**National Sanskrit University**:An Overview

The University Library is named after the first Chancellor, Mahamahopadhyaya Sri PattabhiramaSastri. It has a precious collection of about 1,15000 books, more than 100 journals, and 5500 manuscripts in different languages like Sanskrit, Telugu, Grantha, Tamil, and different scripts such as Devanagari, Grantha, Telugu, Kannada, Tigalari etc.

Open Access maintains the traditional values of journals/Books and other materials –notably,peer review but also editing and formatting and marketing. According to Velterop, there are three criteria for a journal to be open access i.e. free accessibility to all articles, the depositing of all articles in an archive/repository, and a license granted for the right to copy or disseminate.The library consists of the following open sourcebooks/journals/other materials

## Open-Source Books/Journals/other materials:

| Sr. No. | Particulars | |
|---|---|---|
| 1 | | International Journal of Sanskrit Research |
| 2 | | Bhavan's Journal |
| 3 | | Sadashivam: International Research Journal of Sanskrit Shastras |
| 4 | | Sanskrit Vimarsah |
| 5 | | Jahnavi |
| 6 | | Kiranavali Journal |
| 7 | | Ritaayani: A refereed Research Journal of Sanskrit |
| 8 | | Vivekabhaskarah |
| 9 | | Dipasikha |
| 10 | Veda | Aranyaka<br>Brahmana<br>Collection of Oriental works_AitareyaBrahmanam-alochanam_ incompleteSamhitaSrauta<br>satyashadhasrauta sutra with the commentary of Gopinatha _ 9th 10th PrasnasUpanishad |
| 11 | Ithihasa | SRIMANMAHABHARATAM (Uyoga, Bhishma& Drona)<br>SHREE MAHABHARATAM ! BHESHMA PARVA 2– Krishnajit edition 1888<br>MAHABHARATAM – YDYOGA PARVA – NILAKATHA TIKA – KRISHNAJIT PRESS – 1886<br>SHREE MAHABHARATAM ! BHESHMA PARVA – WITH NILAKANTHA TIKA – KRISHNAJIT PRESS 1886 |
| 12 | Vyakarana | SabdikaGrantha<br>ArthikaGrantha<br>VimarsatmakaGrantha<br>Prakrita<br>Prakritapravesha<br>Prakriya<br>DhathuRathnavali<br>Siddhantakaumudi with balamanorama (Bhvadi) |

| | | |
|---|---|---|
| 13 | Nyaya | Pracheenya Nyaya<br>Navya Nyaya<br>VimarsatmakaGrantha |
| 14 | Advaita Vedantha | Pracheenya Nyaya<br>Navya Nyaya<br>VimarsatmakaGrantha |
| 15 | Visishtadvaita Vedanta | PrasthanaTraya<br>PrakaranaGrantha<br>Siddhitraya_with commentary<br>Srimadrahasyatrayasara-15265<br>VimarsatmakaGrantha |
| 16 | Dvaita Vedanta | PrasthanaTraya<br>PrakaranaGrantha<br>VimarsatmakaGrantha<br>A short treatise on Dvaita Philosophy |
| 17 | Mimamsa | Sutra, Bhashya<br>PrakaranaGrantha<br>VimarsatmakaGrantha |
| 18 | Sankhya | Sankhyasutram with vritti of Aniruddha (6 chapters) |
| 19 | Yoga | Sutra &Bhashya<br>PrakaranaGrantha<br>VimarsatmakaGrantha |
| 20 | Sahitya | LakshanaGrantha<br>Kavyaprakasa with Sanketa of ManikyaChandra<br>Chandraloka<br>RasagangadharaHridayam<br><br>LakshyaGrantha<br>Maha Kavya<br>The Raghuvamsa of Kalidasa-with English transalation of M R Kale—sargas<br>Kiratharjuniyam with ghantapatha<br><br>Khanda Kavya<br>Gadya Kavya<br>BhojaPrabandha<br>Bharata sangrahaha 1<br>Champu kavya |

| | | |
|---|---|---|
| | | Nilakantavijaya<br>Rupaka<br>Malavikagnimitram with balabodhini<br>Balamartanda Vijaya by Devaraja Kavi<br>uttharaRamacharitham with Viraraghava tika – 1903<br>Giti Kavya<br><br>VimarsatmakaGrantha<br>Kalidasa Kavya Sourabham<br>ArvacheenaSamskritaMaha Kavya Vimarsha (pages 4-8 missing) |
| 21 | Agama | SAIVA<br>MULAGAMA<br>PADDHATI<br>sakalagama sara sangraha<br>VAISHNAVA<br>PANCHARATRA<br>VAIKHANASA<br>SAKTA |
| 22 | Tantra | Saiva Tantra<br>Sakta Tantra |
| 23 | Jyotisha | Siddhanta<br>Ganitadhyaya_upto page 274<br>Phalita |
| 24 | Dharma Sastra | Smritis<br>Paddhati<br>saraswathivilasa – vyavaharakanda |
| 25 | Artha Sastra | Raja Sastra<br>Vyavahara Sastra |
| 26 | Sanskrit for Beginners | Samskrita Vani |
| 27 | | UDYANA PATRIKA<br>UDYANA PATRIKA JULY 1967-DEC 1967 |

| | | |
|---|---|---|
| | | UdayanaPatrika - Sept1950 – Aug 1951<br>UdayanPatrika -September 1951- august 1952<br>UdyanaPatrika- September 1961- August 1962<br>UdyanaPatrika – July 1955 – August 1956<br>UdyanaPatrika – September 1954- July 1954<br>UdyanaPatrika – September 1943 to August 1944<br>UdyanaPatrika – September 1944 to August 1945<br>UdyanaPatrika – September 1945 to Aug 1946<br>UdyanaPatrika – September 1946 to August 1947<br>UdyanaPatrika – September 1947 t0 August 1948<br>UdyanaPatrika – September 1948 to August 1949<br>UdyanaPatrika – September 1949 to August 1950<br>UdyanaPatrika – September 1957 to August 1958<br>UdyanaPatrika- September 1959 to august 1961 |
| 28 | Hindi Books | Nau KahaniyamMrityuRahasya<br>Numerology<br>Kavyangaparichay (Hindi) |
| 29 | Telugu Books | Megha Duta (Telugu Translation)<br>prapanchajeevavinoda yatra (II & III parts)<br>Swami Vivekananda kavitavaibhavam |
| 30 | Tamil Books | Saiva ShodashaPrakasikai<br>DhravidasirpaRahasyam |
| 31 | English Books | Mythology to History Through Astronomy<br>African Survey – 3202 |

**Conclusion:**

Open Access is a new trend in scholarly communication which aims at providing free access to scholarly literature over the internet and has gained enormous momentum in the recent years. It is largely achievable in a country where policy frameworks, institutional frameworks, information infrastructure, trained manpower

and financial resources are adequately available. The future of the OA movement is to fill up repositories, providing open access to full text and diversification of content where it does not exist.

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# Open Access Services to Excelate/SupportResearch in India: with reference to the INFLIBNETCenter Perspective.

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## Abstract

*This article discusses on different initiatives taken by the INFLIBNET Centre in serving the scholarly, academic and scientific communities to promote and support research activities in the country. India has a well-acclaimed Brain Power and promotion Research will only help India move up the global intellectual ladder. Research plays an important role in the economic development of any country. In fact, research and development form the basis of future competitiveness of an economy. Research refers to a creative work which is undertaken to in a systematic manner so as to increase one's stock of knowledge. In the context of education, it would refer to solving educational problems in a scientific and systematic way.The research in India is a chequered one, while the prestigious institutions and institutions of national importance are excelling in research, The Indian Government has taken a number of steps to promote research. And number of steps could be implemented to foster research such as industry-academia collaboration, development of vocational skills, and provision of more funds and inclusion of research as a criterion for faculty promotion.*

**Keywords**: *Open Access Services, INFLIBNET, Research support*

## Introduction

Information and Library Network (INFLIBNET) Centre, is an Autonomous Inter-University Centre. It is a major National Programme initiated by the UGC in March 1991 as a project under the IUCAA, it became an independent Inter-University Centre in June 1996. INFLIBNET is involved in modernizing university libraries in India using the state-of-art technologies for the optimum utilization of information.

INFLIBNET is set out to be a major player in promoting scholarly communication among academicians and researchers in India.

## Major Programs supporting for Research:

**Vidwan: (URL:https://vidwan.inflibnet.ac.in).**

VIDWAN (**(Expert Database and National Researcher Network)**is the best platform the excellent database provides data/ profiles of scientists or researchers and other faculties working at leading academic institutions and other research & development organizations involved in teaching and research in India.

It provides important information about expert's details i.e., contact address, experience, scholarly publications, skills and accomplishments, researcher identity, etc. NowVidwandatabase has 11990 organizations, 114855 subject experts registered members.

**Objectives & Benefits ofVidwan database:**Quickly and conveniently provide information about expert to peers, prospective collaborators, funding agencies policy makers and research scholar in the country.

- Identify peer reviewers for articles and research proposal.
- Discover prospective collaborators for on-going research projects
- Establish communication directly with the experts who possess the expertise needed by users
- To create information exchanges and networking opportunities among scientists

### Table 1:Current status of category wise registered Institutions in Vidwan:

| S.No | Category | No of Institutions |
|---|---|---|
| **1** | Central Universities | **9446** |
| **2** | Deemed University | **12462** |
| **3** | State University | **6374** |
| **4** | R & D Organization | **15432** |
| **5** | Technical Institute | **18310** |
| **6** | Institute of National Importance | **15413** |
| **7** | Other Institutes | **28577** |

**Table 2:Current status on subjectcategory wise registered expert members in Vidwan:**

| S.No | Category | No of Experts |
|---|---|---|
| **1** | Agricultural Sciences | **7789** |
| **2** | Arts & Humanities | **8998** |
| **3** | Biological Sciences | **4564** |
| **4** | Chemical Sciences | **5653** |
| **5** | Engineering & Technology | **41847** |
| **6** | Medical & Health Sciences | **12206** |
| **7** | Physical Sciences | **11204** |
| **8** | Social Sciences | **20078** |

## 2. IRINS (Indian research Information Network):(URL:https://irins.org).

Now a days researchers and faculties those who are involving in the continues activity of researchshould have multipleidentities like ORCID ID, Google scholar ID etc.,which help to provides a persistent digital identifier **that you own and control**, and that distinguishes you from every other researcher. And to connect trough your iD with your professional information — affiliations, grants, publications, peer review, and more. The IRINS would support to integrate the existing research management system such as HR system, course management, grant management system, institutional repository, open and commercial citation databases, scholarly publishers, etc. It has integrated with academic identity such as ORCID ID, Scopus ID, Research ID, Microsoft Academic ID, and Google Scholar ID for ingesting the scholarly publication from various sources.

The IRINS is a free software-as-service to the academic and research development organizations in India. This portal facilitates the academic, Research and Developmentorganizations and faculty members, scientists to collect, curate and showcase the scholarly communication activities and provide an opportunity to create the scholarly network.

**Stastistics:** Now IRINS portal has69615Profiles,1282608Publication and 14542868 Citations.

**Table3:Current Status of designation wise profiles regstered in IRINS portal:**

| Sl. No: | Designation | No of Experts |
|---|---|---|
| 1 | Professors | **13620** |
| 2 | Associate Professors | **11787** |
| 3 | Assistant Professors | **34841** |
| 4 | Others | **9367** |

## 2.1. Benefits of IRINS:

To Scholars:

A. It provides immense support to find mentors or advisors for their research in the respective domain;
B. It helps the scholars to locate courses in their subject interests and research focus of the department and organization; and
C. It provides scholarly metadata related to research interests of faculty members, research focus of the departments and schools.

To Faculty:

A. It supports the faculty members to showcase their research contributions to the peer group.
B. It provides more significant exposure for their research contributions to the international community and brings funding opportunities from the national and international agencies.
C. Improve the research metadata quality and reduce the repetitive data entry for various assessment system.

## 2.2. Key Features:

- Key research area and research progress of schools, departments and faculty members.
- Faceted search facility with number of filters to find experts and their contribution.

- Import publications from academic identities such as Microsoft Academic Search ID, Google Scholar ID, Researcher ID, Scopus ID.
- ORCID integration to ingest the profile information with publication.
- Altimetry from social media such as Facebook, Twitter and Mendeley.
- Citation from Scopus, CrossRef and link to Open Access article through ImpactStory.
- Networking of faculty through co-author network, map of science network.
- Graphical representation on productivity of the department and individual faculty member.

## 3. Shodh Shuddi(Ouriginal) (URL:**https://shodhshuddhi.inflibnet.ac.in/):**

Plagiarism checking software helps one to identify whether he/she has accidentally included apart of another person's work without giving proper citation and to verify the genuineness of other's works. Plagiarizing a term or part of sentence may be identified by using a web browser. However, there may be paragraphs and even the full document which are copied and pasted without proper acknowledgement. Such unlawful and unethical act is to be identified and restricted to uphold the academic ethics..,

To control Plagiarismactivity in literary works, Based on the recommendation of Sub-Committee, National Steering Committee (NSC) of e-ShodhSindhu, The Ministry of Education, Govt. of India has initiated a programme "ShodhShuddhi" which provides access to Plagiarism Detection Software (PDS) to the universities in India since Sept 1, 2019.

Under this initiative, Ouriginal (formerly Urkund) a Web Based Plagiarism Detection Software system is being provided to all users of universities/Intuitions in the country. Ouriginal is a completely automated system against plagiarism (Anti-plagiarism software) and is being successfully used at universities and colleges in the Country.

**Table4:Stastics for the utilization of Ouriginal Plagiarism Detection Software (PDS):**

| S.No | Category | No of Experts |
|---|---|---|
| **1** | Total Member Institutions | **1060** |
| **2** | Total Users | 124155 |
| **3** | Total Documents Submitted | **34841** |

## 4. Research Project Database(https://www.inflibnet.ac.in/researchproject):

Another initiative step by INFLIBNET Center to promote research is "Research Project Database".Research Project Database consists the details of the accomplished and ongoing funded projects, carried out by various faculty members, working at various universities in India. Currently, it contains more than 13600 research project's information funded by various funding agencies viz. UGC, ICAR, ICMR, DST and DBT etc. The details of the project information have been collected from the project directors, and funding agencies.

Through this facility Scientists, Faculty members or Researchersgetting details about ongoing research projects funded by and other agencies and propose to new areas/problems to do project under funding agencies.

## 5. INFLIBNET's Institutional Repository (URL:https://ir.inflibnet.ac.in/):

INFLIBNET had Institutional repository here you can find articles published in all conventional proceedings of INFLIBNET Centre, More over you can also look for various training material,press clippings,news letters et INFLIBNET's Institutional Repository: Information and Library Network (INFLIBNET) Centre is an autonomous Inter-University Centre of the University Grants Commission (UGC) of India. It is a major National Programme initiated by the UGC in March 1991 with its Head Quarters at Gujarat University Campus, Ahmedabad. Initially started as a project under the IUCAA, it became an independent Inter-University Centre in June 1996 (INFLIBNET, 2014).

INFLIBNET has several major activities for the research and development of universities and college communities in India. There are many activities such as e-Consortium, IndCat, Research Projects, SOUL software, Projects and consultancy and open access initiatives. In this Open access Initiative INFORT, Shodhganga, Shodhgangotri, OJAS and INFLIBNET's Institutional Repository (IR@INFLIBNET). IR@INFLIBNET is very important activity for researcher. DSpace open access software is used for this repository creation and retrieval system. IR@INFLIBNET in this repository there are three main community collections that are freely available to users. Firstly, INFLIBNET in Press and Media (News Clipping about INFLIBNET), in this community news

published on the INFLIBNET activity, those records are collected from the news media. Second main community collection is INFLIBNET's Convention Proceedings.

## 6. Shodhganga (URL:https://shodhganga.inflibnet.ac.in):

**The Shodhganga(A reservoir of Indian Thesis) provides a platform to research scholars in universities to deposit, re-use and share their theses and dissertations.**Shodhganga is a digital repository set-up for submission of electronic versions of theses and dissertations by students / research scholars in universities in India and make them available in open access to the world-wide academic community in response to the UGC Notification (Minimum Standards & Procedure for Award of M.Phil. / Ph.D Degree, Regulation, 2009 and amendment made in 2016) where-in the responsibility of maintaining the digital repository of e-thesis& dessetations is assigned to the INFLIBNET Centre.

The data increging day by day in Shodhganga repository. Now ShodhGanga provides 3,42,894 full text Theses and 8352Synopsis MRP's/FDS/Fellowship reports from 627 Universities (data as on 31.01.2022). Under this initiative research scholars/research supervisors of the universities are requested to deposit electronic version of approved synopsis. Submitted to the universities while registering for the Ph.D Programme. This helps to avoid duplication of research and also provides reference to the later research scholars. When Theses is accepted for the award of Ph.D degree the full text of the same is uploaded in ShodhGanga

**Table 5:Current status of Shodhganga Repository :**

| S.No | Category | No's |
|---|---|---|
| 1 | Full Text Thesis | 342894 |
| 2 | SynopsisMRP's/FDS/Fellowship reports | *8352* |
| 3 | Universities Contributing | 34841 |
| 4 | Universities Signed MOU | 627 |

## 7. ShodhGangotri(Repository for Indian Research in Progress).

Under the initiative called **"ShodhGangotri"**, research scholars / research supervisors in universities are requested to deposit electronic version of approved synopsis submitted by research scholars to the universities for registering themselves for the Ph.Dprogramme. Now it is expanded to MRPs/PDFs/ Emeritus Fellowship etc. The repository on one hand, would reveal the trends and directions of research being conducted in Indian universities, on the other hand it would avoid duplication of research. Synopsis in "ShodhGangotri" would later be mapped to full-text theses in "ShodhGanga". As such, once the full-text thesis is submitted for a synopsis, a link to the full-text theses would be provided from ShodhGangotri to "ShodhGanga"

Large number of research scholars are registering for Ph.D. Every year in various higher educational institutions in the country in a wide variety of subjects and the number of students registering shows an increasing trend during the last few years. **ShodhGangotri project of INFLIBNET greatly helps the research scholars to know about the already finishedPh.D**. Work as well as proposed research work submitted in various universities and institutions in the country.

**Now in Shodhgangotri more than 8395 Synopses uploaded through registered Institutions**. ThusShodh Gangotri plays active role to know about research progress in India and help research scholars to choose right research projects/theme at the time Phd. registrations.

## 8. INFED (INFLIBNET Access Management Federation)

INDIAN Access Management Federation (INFED), the first Federation in India, has adopted Shibboleth, a standard-based open source software, for authenticating authorized users from colleges and universities and provide them seamless access to e-resources from anywhere, anytime.

The INFLIBNET Centre, as one of its core mandates, provides access to scholarly e-resource to universities and colleges in India under the e-ShodSindhu. The INFED is being set-up as a centralized agency to coordinate with member institutions in the process of implementation of user authentication and access control mechanism distributed across participating institutions using standardized rules and metadata for exchange of attributes.

**Objectives of INFLIBNET:**

- To identify and deploy appropriate access management tools with an aim to optimize usage of e-resources and to ensure better Returns on Investment.
- To provide greater flexibility to authorized users enabling them to access e-resources anytime from their campuses, home or even while travelling
- To encourage and assist member institutions to set-up their own independent identity management system so as to authenticate and authourized users
- To act as Identity Provider for all institutions which do not have requisite technical expertise and ICT infrastructure to set-up their own identity provider services
- To define uniform sets of standard rules and metadata for exchanging standardized attributes between institutions as identity provider and publishers as service provider in the process of authentication of authorized users.
- To establish and manage trust relationship between resource provider (publishers), member institutions and federation operators.

## 9. E-Shodh Sindhu (http://infed.inflibnet.ac.in):

E-ShodhSindu: Consortia for Higher Education E-Resources is to provide access to qualitative electronic resources including full-text, bibliographic and factual databases to academic institutions at a lower rates of subscription to Universities, Colleges and Centrally Funded Technical Institutions in INDIA at a lower rates of subscription. **The major aims andobjectives of the e-Shodh Sindhu are as follows:**

- Develop a formidable collection of e-journals, e-journal archives and e-books on perpetual access basis.
- Monitor and promote usage of e-resources in member universities, colleges and technical institutions in India through awareness and training programs.
- Provide access to subscription-based scholarly information (e-books and e-journals) to all educational institutions.
- Provide access to scholarly content available in open access through subject portals and subject gateways.
- Bridge digital divide and move towards an information-rich society.
- Provide access to selected e-resources to additional institutions including open universities and MHRD-funded institutions that are not covered under existing consortia.

- Take-up additional activities and services that require collaborative platform and are not being performed by existing Consortia.
- Moving towards developing a National Electronic Library with electronic journals and electronic books as its major building blocks.

**Table 6**: **Current Statasticsabout E-Shodh Sindhu registered Institutions and Its Services:**

| S.No | Category | No's |
|---|---|---|
| 1 | CFTIs | 98 |
| 2 | Universities | 217 |
| 3 | Technical Institutions | 134 |
| 4 | Colleges | 3200+ |
| 5 | e-Journals | 10000+ |
| 6 | e-Books | 199500+ |
| 7 | e-Books through NDL | 600000+ |
| 8 | Resources | 22 |
| 9 | Databases | 4 |

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# OPEN ACCESS E-BOOKS IN HEALTH SCIENCES

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## Abstract

*"Now what is the point doing science if it is not were to be acccessible?," This questions became the epicenter of though worldwide in the beginnig of the present centry. This gave rise to the open access movement. We have come acorss number of such initiatives abroad and also in this country. Open access ventures in the form of Institutional Respostories, Digital libraryeis, Open archives, etc., are creepting up in India gradually. In this juncture my paper inends on "Open AccessE-Books om Health Sciences".*

**Peter Suber :** Open Access (OA) literature is digital, online, free of chanrge, and free of most copyright and licensing restrictions. What make it possible is the internet ane the consent of the author or copyright-holder. Open Access is entirely compatible with peer review, and all the major open access initiatives for scientific and scholarly literature insist on its importance. Just as authors of journal articles donate their labor, so do most journal editors and referees participating in peer review.Open Access literature is not free to produce, even if it is less expensive to produce than conventionally published literature. The question is not whether scholarly literature can be made costless, but whether there are better ways to pay the bills than by charging readers and creating access barriers. Business models for paying the bills depend on how Open Access is delivered.There are two primary vechicles for delivering open access to research articles: Open Access journals and Open Access archives or repositories.

Open Access archives or repositories do not perform peer review, but simply make their contents freely available to the world. They may contrainunreferred preprints, refereed post prints, or both. Archives may belong to institutions, such as universities and laboratories, or disciplines, such as physics and

economics. Authors may archive their preprints without anyone else's permission. When archives comply with the metadata harvesting protocol of the Open Archives Initiative, then they are interoperable and users can find their contents without knowing which archives exist, where they are located, or what they contain. There is now open-source software for building and maintaining OAI-compliant archives and worldwide momentum for using it.

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Open access journals perform peer review and then make the approved contents freely available to the world. Their expenses consist of peer review, manuscript preparation, and server space. Open access journals pay their bills very much the way broadcast television and radio stations do: those with an interest in disseminating the content pay the production costs upfornt so that access can be free of charge for everyone with the right equipment. Sometimes this means that journals have a subsidy from the hosting university or professional society. Open access journals with institutional subsidies tend to charge no processing fess. Open acces journals can get by on lower subsidies or fes if they have income from other publications, adverstising, priced add-ons, or auxiliary services. Some institutions and consortia arangefeedisocunts. Some open access publishers waive the fee for all researchers affiliated with institutions that have purchased an annual membership. There's a lost of room for creativity in finding way to pay the costs of a peer-reviewed open access journal, and we're fat from having exhausted our cleverness and imagination.

**Open Access is:**

- Open access literature is online, free charge to readers, and free of most copyright and licensing restrictions.
- Immediate, permanent, socio economically too-free, non-gerrymandered, online access to full text. (BOAI)
- New form of distribution – online, free of charge, and free of needless licensing restrictions – is called open access.

The Latest Developments in Open Access E-Books:

The big news for us at Information Today, Inc, is our Live from London blog, which provided coverage of the Online Information 2003 conference Dec,2-4 and was ITI's first foray into Web log publishing environment. Online Information, it was a busy several weeks for news, despite the lull during the Thanksgiving holiday in the U.S.A. number of vendors chose the event to make product announcements, including enhancements to the INSPEC database (see http://www.infotoday.com/newsbreaks/nb031201-3.html), the new Dialog Application Programming Interface, and the new STN Express with Discover! Analysis Edition.

According to an AIP press release, CEO Marc Broadsky noted that the name Scitation "conveys three important messages. First, it stresses the platform's strength in science and engineering. Second, it reinforces AIP's leadership in citation reference linking, both forward and backward. Finally, it signals the breadth and timeliness of online products and services that we develop and host beyond e-documents".

Barbara Quint pointed out how the name Scitation sounds similar to ISI's Science Citation Index and noted Broadsky's competitive comment about "leadership" in citation reference linking. While ISI has clearly led the way in citation linking over the years, this is functionality that we will increasingly see implemented within electronic books environments.

**Linking Update:**

Linking is certainly a hot area of development in the industry. Responding to user expectations, most vendors are rapidly expanding their cooperative agreements to provide transparent navigation capabilities between services. ProQuest Information and Learning has recently announced a series of such partnerships.

ProQuest will link abstract and index records from its online databases with the full text of Project MUSE's documents. It's managed by The Johns Hopkins University Press in cooperation with the MiltonS.Eisenhower Library.

ProQuest Medical Library, Pub Med Link Out will allow Pub Med users to have direct access to more than 330 ful-text titles in the ProQuest Medical Library database. Customers with valid IP-based access to the ProQuest service.

In other news, ProQuest signed an agreement with The New England Journal of Medicine to distribute the full text of the journal in several ProQuest databases. Backfile rights dating to 1996 are included. Content in XanEdu Course Packs will be curent with the print edition. Other databases will be embargoed for 90 days.\

**Biomed Central on a Roll:**

Meanwhile,open-access publishing initiatives, which have begun to offer an alternative to costly subscriptions, continue to gather momentum. BioMed Central announced that it has signed institutional membership agreements with two U.S. consortia: the Consortium of Southern BioMedicalLibraries and Main Biomedical Research Infrastructure Network. Prior to this, BioMed Central has just secured membership agreements with three other U.S. consortia. In addition, 17 Australian insitutions will become BioMed Central members as part of an agreement with the Council of Australian University Librarians. Article-processing charges will be waived for all staff at the Australian member institutions when they publish in any of BioMed Central's 100+ peer-reviewed journals and books.

BioMed Central Central is an independent publisher that's committed to providing immediate, free online access to peer-reviewed biomedical research. Instead of subscription fees for use, authors or their institutions pay an article-processing charge. BioMed Central's Institutional Membership Program was launched in January, 2002 and now has more than 400 members. By the way, BioMed Central is not related to BioMedNet, although BioMedNet was once part of the Current Science Group (owner of BioMed Central).

**Information Commons:**

The open-access publishing model is gaining support in a number of other arenas. The Information Commons, a project of ALA's Office of Information Technology Policy with support from the Rockefeller Foundation, is an effort to create "a new vision for libraries in the digital age by examining the

importanceofestablishing and protecting a vital public sphere of creative works and finding a middle ground beyond the extremism that dominates the debates over who controls information access".

The group is holding an open forum on the issues at ALA's Midwinter Meeting. As background for the discussion, a white paper is available at http://www.ala.org/oitp. According to the paper, one way to advance the information commons is to advocate publication in and subscription to open-access journals.

The following is an excerpt from the discussion document that lists some ways librarians can foster the development of the information commons:

- Involve communities of stakeholders in the design, creation, and man-agreement of information resources.
- Spell out common property resource economic models that elevate the value of shared access over individual consumption.
- Publicize and promote the value and benefits of access as well as the perils of enclosure.
- Promote legislation that ensures public ownership of public research.
- Oppose new copyright laws and regulations that limit the public's access rights.
- Support policies that ensure fair and equitable access to information for everyone.
- Sign licenses and contracts that ensure open access and existing intellectual property rights.
- Encourage peer production of information.
- Publish in and purchase open-access journals and books.
- Promote open-access licenses.
- Purchase materials from a diverse array of information providers.
- Resist attempts to filter and otherwise control access to ideas.
- Protect against the invasion of privacy through the use of technologicalsurveillance measures.
- Develop digital repositories to facilitate open access to the information assets of individuals and communities.

**E-Book Update:**

According to data released by the Open eBook Forum(OeBF), the e-book industry trade and standards organization, retail e-book sales continued strong growth in the third quarter of 2003. Cumulative units sold for the first three quarters of 2003 have reportedly surpassed the 1 million mark for the first time in a single year and are up 64 percent over the third quarter of 2002. Revenues reported by retailers for the third quarter of 2003 were up 37 percent over the same period in 2002. This data is featured in the organization's quarterly. "OeBF eBook Publishing and Retail Statistics Report". Nick Bogatry, executive director of OeBF, said that these figures are notable, given the departure of Gemstar and barnesandnoble.com from the e-book market.

In the library market, netLibrary said that it has added more than 2,000 new titles since October 2033, and its collection now contains 62,500 e-book titles from more than 300 publishers. Currently, more than 5,500 libraries and organizations access netLibrary e-books either through individually owned collections, shared collections via consortia or both. E-library, which offers electronic books and other documents to libraries in an aggregated, searchable database model, has also had a busy year ebrary CEO and CTO Christopher Warnock said: "This has been a tremendous year for ebrary. We have grown our customer base by more than 300 percent and now serve libraries and other organizations in 35 different countries, we've expanded the number of books and other documents in our database offerings to more than 35,000 and we've made significant improvements and enhancements to our technology, which now supports four major languages and can process over 20,000 documents per week".

Ebrary currently offers 16 aggregated databases that cover all academic subject areas as well as general-interest subjects. It also licenses six complementary, publisher-branded databases. A company spokespersons said that ebrary would be making several significant announcements every month.

EBSCO / RoweCom Update:

EBSCO reports that it's in the "final stages of fully integrating the RoweCom acquisition", which included RoweCom U.S. Canada, Australia, and

Europe. (RoweCom filed for bankruptcy in January, 2003. EBSCO completed the acquision of RoweCom in June2003). The company decided to contine operations from the former RoweCom office in Weswood, Mass. Susan Kalas, operations manager of the office, said "We are glad to have become part of a company like EBSCO. They siad their focus was going to be on merging personnel and systems in a way that would best serve our customers in 2003, and they'vedone what they said they were goind to do".

EBSCO said it has merged the existing EBSCO office in Orsay, France, with the former RoweCom office in Villeborn, France. All employees now operate from the Villebon location. EBSCOhas also upgraded the U.K. systems that provide information technology support for Europe.

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**Virtual Library**

"The Virtual Library is the oldest catalog of the web, started by Tim Berners-Lee, the creator of html and the Web itself. Unlike commercial catalogs, it is run by a loose confederation of volunteers, who compile pages of key links for

particular areas in which they are expert… :Fourteen primary categories to check out, or use the search engine.

World eBook Library:

Opportunities to read or download thousands of HTML books online. Provides free, unlimited public access to a comprehensive collection of public domain texts and references, and links to thousand of on-line libraries around the world via the World Wide Web and / or Telnet. For a small annual fee, also offers access to over 60,000 PDF e-books and e-documents, plus 7,000 mp3 audio books. From the World Electronic Text Library Foundation, based in Honolulu, Hawaii.

Other Free Books: http://www.digitallibrary.edu/pk/OAEBooks.html1#4

- **Webooks.com E-library:**
  A Link to over 2,220 free e-books in html, for reading online. In 16 broad categories (Business, Classics, Computers/Internet, Engineering, Entertainment, Life Sciences, Humanities, General Science, Medicine, Society, Physical Science / Mathematics and Teens and Kids) also includes journals and magazines. Individual Topics/Miscellaneous: http://www.digitalibrary.edu.pk/OAEBooks.html#5
- **Medicine:**
  "A free online medical dictionary search engine for definitions of medical terminology, pharmaceutical drugs, healthcare equipment, health conditions, medical devices, specialty terms and medical abbreviations". Note that definitions are brief, and should only be considered as a launching pad for further research. A handy resource, but self-diagnoses should note the disclaimer.
- **Medical Encyclopedia:**
  An online medical and health encyclopedia containing information on over 1,500 tpics, including conditions, diseases, injuries, nutrition, surgeries, symptoms, tests and special topics. Use alphabetically or through the search functions. The site also features significant current news stories and a variety of other resources.
- National Center for Biotechnology Information (NCBI) Bookshelf:

A collection of searchable biomedical books for the Web, illustrated, in HTML. Medical issues covered include asthma, cancer, high blood pressure, obesity and retroviruses. There are also more general works on topics including the Cell, Developmental Biology, Gyneacology, Genes and Disease, Immunobiology and Neurochemistry. Science Fiction/Fantasy, and Horror.

- Doctor Who E-books:
  Never screened, these Seventh Doctor stories from 1992-1997 are a rate treasure from the friendly folk at the BBC. Online, by page in SHTML, or in plain text chapters in you wish to print them out.
  http://www.freebooks4doctors.com/
- Categories:
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  Free Medical books: http://www.digitallibrary.edu.pk/OAEBooks.html#6

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| 2 | Best free Digital Libraries: World | http:://www.e-books.com.au/morefreebooks/freedigitallibraries.html |
| 3 | Other Free Australian Books | http:://www.e-books.com.au/morefreebooks/freeozbooks.htm#other |
| 4 | Other Free Book Sites/Page in English | http:://www.e-books.com.au/morefreebooks/freebooksinenglish.html |
| 5 | Best Free Digital Libraries: New Zealand | http:://www.e-books.com.au/morefreebooks/freekwibooks.htm |
| 6 | All Topics/Miscellaneous | http:://www.e-books.com.au/morefreebooks/freealltopicsbooks.htm. |
| 7 | Free Audio Books | http:://www.e-books.com.au/morefreebooks/freemultilingualbooks.htm |
| 8 | All Languages, Regional and National | http:://www.e-books.com.au/morefreebooks/freemultilinguablbooks.html |
| 9 | Sacred Text and Religion | http:://www.e-books.com.au/morefreebooks/morefreebooks/freereligiousbooks.htm |
| 10 | New Forgotten Books | http:://www.e-books.com.au/morefreebooks/forgottenbooks.htm<br>http:://www.digitallibrary.edu.pk/ |

HEC National Digital Library (DL) is a programme to provide researchers within public and private universities in Pakistan and non-profit research and development organizations with access to international scholarly literature based on electronic (online) delivery, providing access to high quality, peer-reviewed journals, databases, articles and e-Books across a wide range of disciplines. DL has launched ebrary and McGraw Hill Collections to provide around 50,000 online books in addition to more than 23,000 journals that have been made available through the Digital Library Programme. The e-books support programme will

allow researchers to access most of the important text and reference books electronically in a variety of subject areas.

## Conclusion:

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## References:

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*2.Open Access: http://en.wikipedia.org/wiki/Open_access.*

*3.Latest development in open access: http://www.infotoday.com/IT/jan04/hanel.shtml*

*4.Open Access e-Books: http://www.digitallibrary.edu.pk/OAEBooks.html*

*5. Free e-books: http://www.e-book.com.au/freebooks.html*

# OpenAccess Publishing Trends and India's Participation in DOAJ: A Study

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## Abstract

*Open Access publishing has gradually gained momentum over the past few years. The open-access movement has created enormous opportunities for easy access to scholarly content worldwide. The study aims to find out the position of India in the World in terms of the number of OA journals, the major publishers, types of review processes, and the major languages in which the journals are published that are indexed in DOAJ. The results showed that India is ranked 17th in OA journal contribution to DOAJ.*

**Keywords:** *Directory of Open Access Journals, Open Access journals, Indian Contribution, Open Access publishing*

## Introduction:

Open Access publishing has gradually gained momentum over the past few years. Open Access (OA) is a publishing model for scholarly communication where the authors put their work on the internet at no cost and without most of the copyright limitations. It can be read, cited, and reused by anyone around the World. It is based on the idea that scientific research should be provided to all the readers, free of cost, to further study and help in scientific advancement. Unlike the traditional journals where the users have to pay for accessing the journal article, there is no need for a subscription or purchase of a journal in OA journals. The journal articles are available to all the readers irrespective of their academic affiliation or location. When published in an open-access journal, the research is open to a larger audience.

According to UNESCO, "Open access (OA) means free access to information and unrestricted use of electronic resources for everyone. Any digital content can be OA, from texts and data to software, audio, video, and multimedia. While most of these are related to text only, a growing number integrate text with images, data,

and executable code. OA can also apply to non-scholarly content, like music, movies, and novels."

## A brief history of Open Access:

The rapid increase in the subscription cost of the journals during the end of the 20th century witnessed a rapid rise in the journal subscription cost, known as the "serials crisis." Many libraries had no money to cover the subscription fees of the journals. Around this period, the internet started to become popular, the open access movement began, and online publishing became popular.

The Open Access movement started when Project Gutenberg was established in 1971 by Michael S. Hart, an internet-based e-book project that offers access to e-books for free. Then, in the year 1991, arXive.org was established, which allowed scientists to self-archive their pre-published papers in an online repository. In 1999, the Journal of Medical Internet Research, a free online distribution journal, was launched. In 2000, PubMed Central, an open access repository, and BioMed Central, an open-access publisher, was established. During 2002 and 2003, the academic community collaborated to create the Budapest Open Access Initiative and the Berlin Declaration on Open Access, which broadened the concept of Open Access. In 2003, the Public Library of Science (PLoS), which publishes open access journals, was established. In the same year, DOAJ (Directory of Open Access Journal), which indexes and gives access to open access journals, was also found. Plan S is a recent initiative to increase and promote the OA scholarly publication. It is a Science Europe initiative for open access science publishing which was launched in 2018. Today, many institutions, funding organisations, publishing houses and governments worldwide support increasing OA publications.

## Types of Open Access:

There are different types of OA through which the researchers can share or publish their work. They are usually described using the colour system. The most well-known names are Green, Gold, and hybrid, but various other models are also used. Some of them are as follows:

1. ***Green OA:***In Green OA, the authors can self-archive a copy of their work in a freely accessible subject-based repository or an institutional repository after publishing their article in any journal.
2. ***Gold OA:***The publisher gives free and immediate access to the full content and the final published version of a journal article. In some situations, the publisher may levy an Article Processing Charge (APC), which may be paid by the author's institution or funding organisation or by an individual researcher.
3. ***Hybrid OA:*** In Hybrid OA, individual articles in subscription-based journals can be made open access instantly upon payment of APC. Hybrid OA includes both open access and closed access articles.
4. ***Diamond OA:*** In Diamond OA, the journals are free for the readers to read and free for the authors to publish in it; there is no need to pay any APC by the authors. It is also known as Platinum open access. These journals are often supported by institutions or national or regional funding agencies.
5. ***Bronze OA:*** The journal articles are freely available on the publisher's page to read, but it does not have an open licence, so the readers cannot reuse the journal article.

## Objectives:

The main objectives of the study are:

- To know the leading countries in terms of OA journal publishing in DOAJ
- To identify well-known publishers in India and at international levels contributedto OA
- To study the language-wise OA journal publication in DOAJ
- To explore the different types of review processes used by DOAJ

## Methodology:

For this study, all the data and information were only obtained from the Directory of Open Access Journal (DOAJ). The retrieved data (as of 20$^{th}$ February, 2022)

were organized in the MS Excel sheet and evaluated using statistical techniques like average and percentage to get the study's objectives.

## Directory of Open Access Journals (DOAJ):

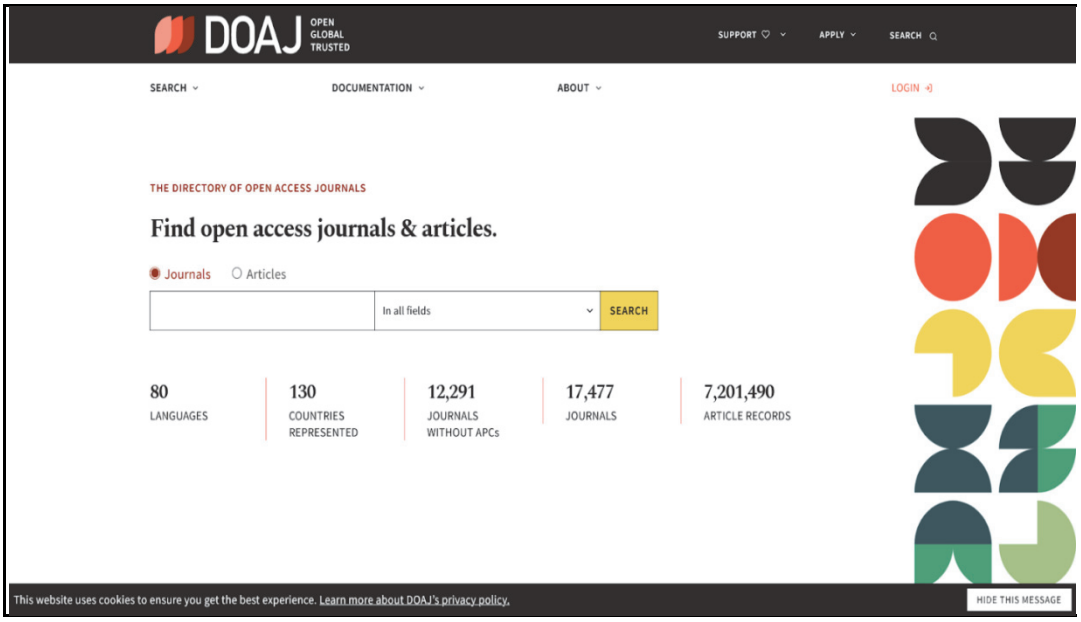



**Figure 1: Homepage of DOAJ**

Directory of Open Access Journals (DOAJ) is a well-known and reliable directory of scientific and peer-reviewed journals that is entirely open to all, and anyone can access the directory. DOAJ was founded in 2003 with only 300 journals that have grown to nearly 17,477 journals, out of which 12,291 journals are without Article Processing Charges (APC). It has around 7,203,526 article records from 130 countries published in about 80 different languages. It was initially set up and maintained by Lund University, later in 2013, it was replaced by the Infrastructure Services for Open Access (IS4OA). Many libraries, publishers, and other like-minded organisations contribute financially to DOAJ. Around 4 million people visit the DOAJ database every year.

## Findings and Results:

### *OA Journal Publishing in DOAJ - International scenario:*

**Table 1: List of top 30 leading Countries publishing OA journal in DOAJ**

| Country | Number of journals | Rank | % | Country | Number of journals | Rank | % |
|---|---|---|---|---|---|---|---|
| Indonesia | 1,902 | 1 | 10.9 | Argentina | 329 | 16 | 1.9 |
| United Kingdom | 1,881 | 2 | 10.8 | India | 323 | 17 | 1.8 |
| Brazil | 1,633 | 3 | 9.3 | Germany | 316 | 18 | 1.8 |
| United States | 987 | 4 | 5.6 | France | 275 | 19 | 1.6 |
| Spain | 892 | 5 | 5.1 | Serbia | 206 | 20 | 1.2 |
| Poland | 798 | 6 | 4.6 | Canada | 196 | 21 | 1.1 |
| Iran | 683 | 7 | 3.9 | Mexico | 187 | 22 | 1.1 |
| Russian Federation | 528 | 8 | 3.0 | China | 173 | 23 | 1.0 |
| Switzerland | 513 | 9 | 2.9 | Korea | 154 | 24 | 0.9 |
| Italy | 469 | 10 | 2.7 | Portugal | 152 | 25 | 0.9 |
| Turkey | 429 | 11 | 2.5 | Chile | 146 | 26 | 0.8 |
| Colombia | 411 | 12 | 2.4 | Croatia | 143 | 27 | 0.8 |
| Ukraine | 391 | 13 | 2.2 | Czechia | 138 | 28 | 0.8 |
| Netherlands | 369 | 14 | 2.2 | Norway | 119 | 29 | 0.7 |
| Romania | 366 | 15 | 2.1 | Australia | 118 | 30 | 0.7 |

One hundred thirty countries have contributed to the OA journal publications. **Table 1** shows the top 30 leading countries in the OA journal publications indexed in DOAJ. Indonesia has topped the list with 1,902 journals accounting for 10.9% of the total OA journals in DOAJ, the United Kingdom ranked 2nd with 1,881 journals, Brazil ranked 3rd with 1,633 journals, the United States ranked 4th with 987 journals, Spain ranked 5th with 892 journals, and so on. India ranked 17th on the list with 323 journals. Most of the OA journal contributions in DOAJ are from European and American countries, while big countries like India and China have ranked lower in the list. The Asian and African countries need to participate and contribute more to the OA publication activities.

**Table 2: List of top 30 OA journals published in major languages in DOAJ**

| Languages | No. of journals | Rank | % | Languages | No. of journals | Rank | % |
|---|---|---|---|---|---|---|---|
| English | 13,721 | 1 | 78.5 | Croatian | 119 | 16 | 0.7 |
| Spanish | 3,363 | 2 | 19.2 | Romanian | 109 | 17 | 0.6 |
| Portuguese | 2,265 | 3 | 13.0 | Czech | 97 | 18 | 0.6 |
| Indonesian | 1,512 | 4 | 8.7 | Swedish | 80 | 19 | 0.5 |
| French | 1,300 | 5 | 7.4 | Chinese | 77 | 20 | 0.4 |
| Russian | 943 | 6 | 5.4 | Slovak | 75 | 21 | 0.4 |
| Italian | 686 | 7 | 3.9 | Danish | 67 | 22 | 0.4 |
| German | 585 | 8 | 3.3 | Lithuanian | 57 | 23 | 0.3 |
| Ukrainian | 376 | 9 | 2.2 | Slovenian | 56 | 24 | 0.3 |
| Polish | 353 | 10 | 2.0 | Korean | 53 | 25 | 0.3 |
| Persian | 327 | 11 | 1.9 | Norwegian Bokmål | 53 | 26 | 0.3 |
| Turkish | 307 | 12 | 1.8 | Norwegian | 50 | 27 | 0.3 |
| Arabic | 208 | 13 | 1.2 | Galician | 37 | 28 | 0.2 |
| Catalan | 150 | 14 | 0.9 | Dutch | 34 | 29 | 0.2 |
| Serbian | 147 | 15 | 0.8 | Finnish | 33 | 30 | 0.2 |

The OA journals in DOAJ are being published in around 80 languages. **Table 2** shows the top 30 leading languages in which the OA journals are published. The English language has topped the list with 13,721 journals accounting for 78.5% of the total languages. Spanish has ranked 2nd with 3,363 journals, Portuguese has ranked 3rd with 2,265 journals, Indonesian has ranked 4th with 1,512 journals, French has ranked 5th with 1,300 journals, etc. We can see that most of the languages covered are from European and American countries. Whereas, only a few languages are published from Asian countries like Indonesian (1,512), Persian (327), Arabic (208), Chinese (77), etc. The Asian countries should participate more in publishing in OA journals.

**Table 3: Major publishers' contributing to DOAJ**

| Major Publishers | No. of Journals | % | Major Publishers | No. of Journals | % |
|---|---|---|---|---|---|
| Elsevier | 602 | 3.4 | KeAi Communications Co., Ltd. | 73 | 0.4 |
| MDPI AG | 308 | 1.7 | Universidade de São Paulo | 54 | 0.3 |
| BMC | 307 | 1.7 | Emerald Publishing | 49 | 0.3 |
| Sciendo | 296 | 1.6 | Universidad Complutense de Madrid | 45 | 0.3 |
| Wolters Kluwer Medknow Publications | 223 | 1.2 | AOSIS | 44 | 0.2 |
| Hindawi Limited | 216 | 1.2 | Copernicus Publications | 44 | 0.2 |
| Wiley | 199 | 1.1 | Ubiquity Press | 43 | 0.2 |
| SpringerOpen | 185 | 1.0 | University of Bologna | 43 | 0.2 |
| SAGE Publishing (177) | 177 | 1.0 | Pensoft Publishers | 41 | 0.2 |
| Taylor & Francis Group | 176 | 1.0 | UniversitasGadjahMada | 41 | 0.2 |
| Frontiers Media SA. | 108 | 0.6 | Tehran University of Medical Sciences | 40 | 0.2 |
| UniversitasNegeri Semarang | 80 | 0.5 | Lodz University Press | 38 | 0.2 |
| Dove Medical Press | 78 | 0.4 | Universidad Nacional de Colombia | 38 | 0.2 |
| De Gruyter | 76 | 0.4 | UniversitasUdayana | 38 | 0.2 |
| Oxford University Press | 76 | 0.4 | Consejo Superior de InvestigacionesCientíficas | 37 | 0.2 |

At present, around 100 publishers are participating in OA journal publishing in DOAJ. **Table 3** shows the major publishers at the international level. Elsevier tops the list with 602 journals accounting for 3.4% of the total publishers in DOAJ, MDPI AG ranked 2nd with 308 journals, BMC ranked 3rd with 307 journals, Sciendo ranked 4th with 296 journals, Wolters Kluwer Medknow Publications ranked 5th with 223 journals, Hindawi Limited ranked 6th with 216 journals, and so on. We can see that the majority of the OA journal publishers are commercial publishers. In contrast, the university publications number is more, but their OA journal publications are fewer than the commercial and private publishers.

**Table 4: Different types of OA Review Processes followed by DOAJ**

| S.No. | Type of Review Process | Numbers of journals |
|---|---|---|
| 1 | Double-blind peer review | 9,926 |
| 2 | Blind peer review | 4,999 |
| 3 | Peer review | 2,368 |
| 4 | Open peer review | 193 |
| 5 | Editorial review | 126 |
| 6 | Post-publication peer review | 8 |
| 7 | Triple blind peer review | 2 |
| 8 | Committee review | 1 |
| 9 | Community review | 1 |
| 10 | Open Peer Commentary | 1 |

**Table 4** shows the different OA Review processes that are provided in DOAJ. It is found that the majority of the journals followed Double-blind peer review with 9,926 journals. Followed by Blind peer review with 4,999, Peer review with 2,368 journals, Open peer review with 193 journals, Editorial review with 126 journals and Post-publication peer review, Triple blind peer review, Committee review, Open peer commentary with one journal each, respectively.

***OA Journal Publishing in DOAJ- Indian scenario:***

**Table 5: List of major publishers in India contributing to DOAJ**

| S.No | Publishers | No of Journals | % |
|---|---|---|---|
| 1 | Wolters Kluwer Medknow Publications | 222 | 68.7 |
| 2 | Thieme Medical and Scientific Publishers Pvt. Ltd. | 13 | 4.0 |
| 3 | NISCAIR | 5 | 1.5 |
| 4 | ICT Academy of Tamil Nadu | 4 | 1.2 |
| 5 | Elsevier | 3 | 0.9 |
| 6 | JCDR Research and Publications Pvt. Ltd. | 3 | 0.9 |
| 7 | SAGE Publishing | 3 | 0.9 |
| 8 | CSIR-NISCAIR | 2 | 0.6 |
| 9 | Veterinary World | 2 | 0.6 |
| 10 | Others (66 individual publishers with each one) | 66 | 20.4 |
| | Total | 323 | |

As for the Indian OA journal publishers, 75 publishers publish 323 journals. It is found that most of the Indian open access journal publications are being published by commercial and private publishers. The Wolters Kluwer Medknow Publications topped the list with 222 journals, followed by Thieme Medical and Scientific Publishers Pvt. Ltd. with 13 journals, government organizations such as NISCAIR with 5 journals, ICT Academy of Tamil Nadu with 5 journals. In contrast, leading publishers like Elsevier and SAGE publish only 3 journals each, JCDR Research and Publications Pvt. Ltd. also publishes 3 journals. CSIR-NISCAIR and Veterinary World are publishing 2 journals each. The rest of the 66 publishers are contributing just 1 journal each. The commercial publishers dominate OA journal publication in India, just like at the international level.

**Discussion and Conclusion:**

In the past, research papers were traditionally published in journals issued by academic institutions and learned societies. As the number of researchers worldwide increased, the need to publish their work also increased. Commercial publishers initially collaborated with academic institutions to give technical and marketing support. Later, the private publisher took over these publication activities because most of the academic institutions were unable to cope with the publication and business activities. Over the last few decades, research publication has evolved as a whole and has become a very profitable industry. The academic and learned society participations are very few. As a result of the widespread commercialization of the research publishing system, most publiclyfundedinstitutions and research organizations remain behind pay-walls. Thus, it is accessible only if the author, institution, or reader pays for it. Universities and research organisations must reclaim their former glory of self-publishing articles through the new avatar open access publishing channels and make available theirresearch publications to the public free of cost without any barriers.

In recent years, the open access movement has created enormous opportunities for free access to scholarly publications to the World. Remarkably, the European and American countries are doing worthy open access initiatives. A lot of data and research publications are freely available, and the government encourages and supports these initiatives and activities. Many open access initiatives and journal publications have begun in India through the years, including the Indian Science Congress, Indian MEDLARS Center, Indian Academy of Science, National Institute of Science Communication and Information Resources (NISCIR), Indian National Science Academy, etc. India's Contribution to open access is increasing; nevertheless, there is still a need to improve the quantity and quality of the scholarly work in OA journal publishing. India should mandate policies and

regulations to increase open access publications as a developing country. The government and other funding agencies have to take the required steps to improve the open access publication in India.

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# Source of availability and accessibility of information and the use of library services in the affiliated colleges of maduraikamarajuniversityduring post covid times, tamilnadu

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**Abstract**

*By taking the survey from the 68 affiliated colleges of MKU we have come to know the various facilities that are provided by the various colleges and also the university. We can also aware of the books, journals, magazines and also internet sources in various colleges which can be helpful to other colleges in developing their infrastructures of the libraries. 43.83% respondents daily visited the library. The audio visual aids were used by 26.8% of the respondents. Book bank facility has been used by 76% of respondents among 53.43% were fully satisfied with the performance. In the survey taken among the respondents UGC- INFLIBNET occupied the first position among the e-resources. 83% of the respondents were benefited by the text book, magazines & journals for their research. 24% of respondents have used serials materials on a daily basis. Respondents are highly satisfied with the overall library resources*.

**Keywords:**Madurai-Kamaraj University, Post Covid Times, Availability and Accessibility, Library services, e- resource and Users.

## Introduction

The study investigates the source of availability and accessibility of information and the use of library services in the affiliated colleges of Madurai Kamaraj University, Tamil Nadu. The term availability must be distinguished from accessibility. Availability of information resources means ensuring their presence in the libraries for immediate use. Learning materials might be available i.e. the library has acquired them but inaccessible for use to those who need them for whatever reason (Un-cataloged, miscataloged, miss-shelved etc.). Accessibility means that users can reach and use the resources.

## Availability of information resources

Availability of information establishes a new standard of system and network that are always on for different applications. In this system and network data are always available for the users. Availability of information resources entails acquiring and also providing means by which users could get necessary information. It tries to ensure that every user gets document, which could satisfy his/her quest for information. Indeed, availability of information resources could justify the existence of the library or information center. It is in line with this that the study is pursued to assess the level at which information resources are made available and accessible by the users of affiliated colleges of MKU. Perhaps a study like this could give an insight into how the library is used and relevant services provided to the users.

## Accessibility of information resources

The term accessibility is used in general to describe the extent to which a system is usable by a wide range of users. In other words, it is the degree of ease with which it is possible to reach a certain location from other locations. Accessibility can also be viewed as the ability to access the functionality and possible benefit of some system or entity. Accessibility is very important specifically as it focuses on people with disabilities and their access to entities, often through use of assertive devices such as screen reading, web browsers and catalogs through technological format. It is one thing for the resources to be available and it is another thing to be accessible. Whatsoever is available but not accessible is equally useless.

## Description of Area of Study

The study area is restricted to the affiliated colleges of Madurai Kamaraj University, Madurai in Tamil Nadu. It covers the availability and use of information resources. It basically seeks to focus on the direct services to the users, for the convenience of the users and the functions of the library, which are geared towards achieving the aims and objectives of the library.

## Purpose and objective of the Study

The purpose of this study is to examine the relationship of availability and accessibility of
information sources with the use of library services in the affiliated colleges of MKU, Madurai.

From the problems enumerated in the research work, the following objectives are provided for the study:

- to find out the type of information services provided in the college library
- to investigate how information resources are accessed by the user
- to find out the availability of information services provided in the library

- to find out the awareness and uses of E- Resources
- to assess how adequate these resources are to the clientele
- to find out how information resources are used and to identify the types of information resources available in the library.

**Study Population**

The Study population includes libraries of affiliated colleges of Madurai Kamaraj University, Tamil Nadu. Totally there are 98 colleges affiliated to Madurai Kamaraj University, out of that 68 colleges are taken for the study. The sample includes students of undergraduate, postgraduate and teaching faculty of affiliated colleges of Madurai Kamaraj University

**Methodology**

In usage surveys, data are often obtained by using questionnaires. The questionnaires method was used for the collection of usage data in the present study. The respondents from the questionnaire were drawn from MKU affiliated colleges of Tamil Nadu. The data thus collected were analyzed and on the basis of this data, the interview technique was employed to seek further information from selected users to clarify the doubts faced during analysis of questionnaires. The stratified sampling technique was adopted to choose the population for collection of data with an objective of taking representative samples from all user categories and from all arts and science under study. Proper care was taken to choose samples representing each of user categories proportionately. Altogether 1421 questionnaires were distributed among the users of different college libraries in MKU affiliated college of Tamil Nadu. The total responses received are 1209 respectively.

**DATA ANANYSIS**

## Availability of resources in the library

**Table 1 – Types of Information Resources Available in the Library**

| S. No | Documentary sources | Most frequently | Frequently | Occasionally | Not to all |
|---|---|---|---|---|---|
| 1 | Books | 484 (40.03) | 492 (40.69) | 221 (18.27) | 12 (0.99) |
| 2 | Periodicals | 382 (31.59) | 416 (34.40 ) | 362 (29.94) | 49 (4.05) |
| 3 | Dictionary | 226 (8.69) | 296 (24.48) | 545 (45.07) | 142 (11.74) |
| 4 | Encyclopedia | 155 (12.82) | 176 (14.55) | 653 (54.01) | 225 (18.61) |

| | | | | | |
|---|---|---|---|---|---|
| 5 | Year book | 156 (12.90) | 204 (16.87) | 614 (50.78) | 235 (19.43) |
| 6 | Gazetteers | 92 (7.60) | 98 (8.10) | 796 (65.83) | 223 (18.44) |
| 7 | Theses | 198 (16.37) | 219 (18.11) | 567 (46.89) | 225 (18.61) |
| 8 | Patents | 89 (7.36) | 107 (8.85) | 789 (65.26) | 224 (18.52) |
| 9 | Reports | 54 (4.46) | 73 (6.03) | 865 (71.54) | 217 (17.94) |
| 10 | Hand books | 89 (7.36) | 107 (8.85) | 789 (65.26) | 224 (18.52) |
| 11 | Directories | 95 (7.85) | 116 (9.59) | 765 (63.27) | 233 (19.27) |
| 12 | Seminar / Conference | 51 (4.21) | 63 (5.21) | 871 (72.04) | 224 (18.52) |

*Note: Figures in parenthesis shows the percentage.*

Apart from knowledge the usage of information sources it is equally important to know the frequency of use of different types of information sources. Therefore respondents were asked to mention the frequency of use of information sources available in the library. Analysis of the responses indicates that there is a marked preference for books (40%) followed by periodicals (31.59%). It is also observed that almost all reference sources viz. Seminar / Conference (72.04), Reports (71.54%), Gazetteers (65.83%), Handbooks (65.26), Directories (63.27) and Encyclopedia (54.01) are being consulted by the users occasionally (Table 1).

**Table 2 frequency of use of non –documentary sources**

| Non – documentary sources | Most frequently | Frequently | Occasionally | Not at all |
|---|---|---|---|---|
| Atlas – Maps | 231 (19.1) | 324 (26.79) | 504 (41.69) | 150 (12.40) |
| Globes | 32 (2.64) | 63 ( 5.21) | 230 (19.02) | 884 (73.12) |
| Plates | 23 (1.9) | 41 ( 3.39) | 196 (16.21) | 949 (78.49) |
| CD / DVD | 185 (15.3) | 268 (22.16) | 469 (38.79) | 287 (23.74) |
| Audio / Visual Material | 212 (17.53) | 292 ( 24.15) | 346 (28.62) | 359 (29.69) |
| Microforms | 21 (1.74) | 36 (2.98) | 186 (15.38) | 966 (79.90) |
| Microfilms | 63 (5.21) | 89 (7.36) | 192 (15.88) | 865 (71.54) |
| Audio / Video Cassettes | 39 (3.23) | 52 (4.30) | 168 (13.89) | 950 (78.57) |

Note: Figures in parenthesis shows percentage.

Table 2 shows that fairly good number of respondents use atlas/maps (26.8%) followed by audio-visual materials (24.15%) and CD/DVD (22.16%). It is interesting to note that except for atlas / maps, CD / DVD and audio-visual materials, 60% of respondents have not used the non-documentary sources in spite of their availability in the library. The reasons for less use of these resources would be the lack of awareness and inconvenience in use of these resources.

## Types of Information Services provided in the Library

**Table 3 Library services**

| Services | Yes | No | Fully satisfied | Satisfied | Partially satisfied | Not satisfied |
|---|---|---|---|---|---|---|
| Lending service | 989 | 220 | 321 | 686 | 181 | 19 |
| Book band facilities | 920 | 289 | 325 | 646 | 193 | 45 |
| Reference service | 1010 | 199 | 285 | 715 | 170 | 39 |
| Current Awareness Service | 826 | 383 | 214 | 609 | 343 | 43 |
| Selective dissemination | 469 | 740 | 146 | 293 | 691 | 79 |
| DDS | 512 | 697 | 192 | 325 | 571 | 121 |
| User orientation programme | 612 | 597 | 201 | 379 | 544 | 73 |
| Inter library loan | 421 | 788 | 112 | 214 | 262 | 621 |
| Audio video facility | 627 | 582 | 103 | 240 | 227 | 639 |
| Record player / cassette facilities | 509 | 700 | 39 | 107 | 351 | 712 |
| Xerox services | 711 | 498 | 213 | 486 | 458 | 52 |
| Online service | 621 | 588 | 197 | 509 | 374 | 129 |
| Internet service | 839 | 370 | 254 | 611 | 225 | 119 |
| CD-ROM search | 563 | 646 | 112 | 369 | 347 | 381 |

The basic objectives of library services are to provide required information to its users and to save the precious time of the library users. The services provided by the library are given table 3. It shows that 81.8% of respondents use lending service and among them 56.74% are satisfied and 14.97% are partially satisfied with the service. In case of book bank facility, 76.1% respondents make use of the service and among them 53.43% are satisfied and 15.96% are partially satisfied. 83.54% of respondents make use of reference service of which 59.14% are satisfied

and 14.1% are partially satisfied. 69.39% respondents make use of internet services and among them 50.53% are satisfied and 18.61% are partially satisfied. 68.32% respondents make use of current awareness service and among them 50.37% are satisfied and 28.37% are partially satisfied with the service. It is observed that other services such as SDI, DDS, ILL, CD-Rom search etc., are fairly used.

**Table 4**
**Based on Types of E-Resources**

| S.No | E-Resources | No. of Respondents | Percentage |
|---|---|---|---|
| 1 | E. Books | 249 | 20.6 |
| 2 | E-Journals | 378 | 31.27 |
| 3 | E-Magazines | 218 | 18.03 |
| 4 | E-Thesis / Dissertations | 121 | 9.92 |
| 5 | E-Database | 132 | 10.91 |
| 6 | All | 110 | 9.09 |
| Total | | 1209 | 100 |

The data of analysis in Table 4 reveals that E- Journals and E- Books were the most used e- resources by the respondents as seen from their responses which are 378 (31.27%) and 249 (20.06%) respectively. It is followed by use of E- magazines 18.3 %; e- thesis & dissertations 9.92% e- database 10.91% and only 9.09% responses indicates the use of all e- resources used by the respondents.

**Table 5 Sources of e-resources used**

| S.No | Sources | No. of Respondents | Percentage |
|---|---|---|---|
| 1 | UGC-INFLIBNET | 364 | 30.10 |
| 2 | DELNET | 244 | 20.18 |
| 3 | INTERNET RESOURCES | 226 | 18.70 |
| 4 | OPEN ACCESS RESOURCES | 163 | 13.48 |
| 5 | CD / DVD | 212 | 17.54 |
| | | 1209 | 100 |

The e-resources available in the library are basically the subscribed online resources through UGC-INFLIBNET consortium, online resources freely available

on the internet and open access journals/books and the offline e-resources in the form of CDs/DVDs.

A study of data in Table 5 indicates the category-wise respondents' sources of e-resources used. UGC-INFLIBNET occupied the first position their overall sources of e-resources used as their secured and followed by DELNET

**Table 6Based on Level of Satisfaction of E- Resources**

| S.No | Response | No. of Respondents | Percentage |
|---|---|---|---|
| 1 | Highly Satisfied | 243 | 20.10 |
| 2 | Satisfied | 625 | 51.70 |
| 3 | Moderately satisfied | 223 | 18.44 |
| 4 | Dissatisfied | 118 | 9.76 |
| Total | | 1209 | 100 |

Table 6 shows the results that most of the students 625 respondents (51.70%) are satisfied with all e- resources they are getting from the identified sources. Furthermore, 243 (20.10%) indicated they were fully satisfied while 223 (18.44%) and 118 (9.76%) indicated moderately satisfied and dissatisfied respectively.

**Table 7Based on Problems faced by the Users**

| S.No | Response | No. of Respondents | Percentage |
|---|---|---|---|
| 1 | Power failure | 121 | 10.1 |
| 2 | Slow Accessibility | 384 | 31.75 |
| 3 | Lack of IT knowledge | 226 | 18.70 |
| 4 | Limited access to computers | 224 | 18.52 |
| 5 | Lack of time | 142 | 11.75 |
| 6 | Poor personal assistance | 111 | 9.18 |
| | | 1209 | 100 |

It can be inferred from Table 7 that using the Internet is not free from problems. The most common problem faced by the users is that more no of respondents 384 (31.75%) of slow Internet access speed which takes a lot of their slot time to retrieve the relevant information.

## Accessibility to Information Resources in the Library

**Table 8Level of Accessibility**

| Items | Easily Accessible | Not Easily Accessible | Mean | S.D |
|---|---|---|---|---|
| Textbooks | 83<br>83% | 17<br>17% | 3.23 | .98 |
| Newspapers and Magazines | 83<br>83% | 17<br>17% | 3.22 | 1.00 |
| Reference Materials (dictionary, encyclopedia, handbook etc,) | 82<br>82% | 18<br>18% | 3.12 | 1.00 |
| Journals | 71<br>71% | 29<br>29% | 2.95 | 1.05 |
| Online Public Access Catalogue (OPAC) | 73<br>73% | 27<br>27% | 2.93 | 1.08 |
| Online Databases (Ebscohost, Jstor, Science Direct, e.t.c.) | 67<br>67% | 33<br>33% | 2.77 | 1.05 |
| E-books | 65<br>25.0% | 35<br>17.0% | 2.73 | 1.02 |

Table 8 shows that the most accessible information resources were: Textbooks 83 (83%), followed by Newspapers and Magazines percentage 83 (83%), Reference materials 82 (82%), Journals 71(71%) than the e-resources Online Databases 67(67%) E-books 65 (65%).

**Table 9Frequency of using library resources**

| Items | Once in Several Months | Monthly | Twice a week | Once a week | Daily | Mean | S.D |
|---|---|---|---|---|---|---|---|
| Serials (Journals, newspapers, magazines, etc.) | 35<br>35.0% | 17<br>17.0% | 9<br>9.0% | 15<br>15.0% | 24<br>24.0% | 2.76 | 1.63 |
| Textbooks | 33<br>33.0% | 16<br>16.0% | 15<br>15.0% | 20<br>20.0% | 16<br>16.0% | 2.70 | 1.50 |
| Online Databases | 46<br>46.0% | 7<br>7.0% | 16<br>16.0% | 15<br>15.0% | 16<br>16.0% | 2.48 | 1.57 |

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| (Ebscohost, Jstor, Science Direct, e.t.c.) | | | | | | | |
| E-books | 41<br>41.0% | 14<br>14.0% | 18<br>18.0% | 15<br>15.0% | 12<br>12.0% | 2.43 | 1.45 |
| Reference Materials (dictionary, encyclopedia, handbook e.t.c.) | 45<br>45.0% | 16<br>16.0% | 12<br>12.0% | 13<br>13.00% | 14<br>14.0% | 2.35 | 1.50 |
| Online Public Access Catalogue (OPAC) | 51<br>51.0% | 14<br>14.0% | 13<br>13.0% | 11<br>11.0% | 11<br>11.0% | 2.17 | 1.44 |

On the frequency of using library resources as shown in Table 9, it was found that 24 (24%) used serials materials on a daily basis, 16 (16%) used textbooks and Online Databases each. Others were Reference 14 (14%), E-books 12 (12%) and OPAC 11 (11%). However, OPAC 51 (51%), Online Databases 46 (46%), Reference materials 45 (45%), E-books 41 (41%) Serials 35 (35%), Textbooks 33 (33%) were used once in several months.

**Table 10Challenges of accessing/using library resources**

| Items | Agree | Disagree | Mean | S.D |
|---|---|---|---|---|
| It takes much time to search for materials needed in the library | 30<br>30% | 70<br>70% | 2.03 | .88 |
| Office is far to the library | 26<br>26% | 74<br>74% | 1.95 | .90 |
| Materials are not available | 25<br>25% | 75<br>75% | 1.92 | .95 |
| Inadequate knowledge in the use of ICTs | 25<br>25% | 75<br>75% | 1.92 | .869 |
| Library staff are not willing to render service/help | 4<br>4% | 96<br>96% | 1.49 | .58 |

Table 10 showed that 30 (30%) of the respondents agreed that it takes much time to search for materials needed in the library which is the highest figure on the challenges of accessing/using the library followed by office is too far to the library 26 (26%). Findings further revealed from that 96 (96%) of the respondents disagreed that library staff are not willing to render services/help".

**Table 11Level of satisfaction**

| Items | Very satisfied | Satisfied | Never satisfied | Mean | S.D |
|---|---|---|---|---|---|
| Textbooks | 48<br>48.0% | 41<br>41.0% | 11<br>11% | 2.30 | .66 |
| Newspapers and Magazines | 50<br>50.0% | 38<br>38.0% | 12%<br>12 | 2.26 | .66 |
| Online Public Access Catalogue (OPAC) | 55<br>55.0% | 30<br>30.0% | 15<br>15% | 2.15 | .66 |
| Reference Materials (dictionary, encyclopedia, handbook e.t.c.) | 60<br>60.0% | 26<br>26.0% | 14<br>14% | 2.12 | .62 |
| Online Databases (Ebscohost, Jstor, Science Direct, e.t.c.) | 54<br>54.0% | 25<br>25.0% | 21<br>21% | 2.07 | .70 |
| E-books | 56<br>56.0% | 22<br>22.0% | 22<br>22% | 2.03 | .69 |
| Journals | 52<br>52.0% | 24<br>24.0% | 24<br>24% | 2.00 | .70 |

Table 11 revealed respondents levels of satisfaction of library resources. Findings revealed high level of satisfaction by the respondents with the library resources: Reference materials 60 (60%), E-books 56 (56%), OPAC 55 (55%), Online

Databases 54 (54%). However, 24 (24%) of the respondents were never satisfied with Journals, followed by 22 (22%), E-books and 21 (21%) online databases.

**Findings**

- Frequency of visit to the Library, 43.84 respondents made daily visits to the library
- Majority of the students (30.77%) visited library to borrow books
- Good number of respondents uses atlas/maps (26.8%) followed by audio-visual materials (24.15%) and CD/DVD (22.16%).
- Book bank facility, 76.1% respondents make use of the service and among them 53.43% are satisfied and 15.96% are partially satisfied.
- E- Journals and E- Books were the most used e- resources by the respondents as seen from their responses which are 378 (31.27%) and 249 (20.06%) respectively.
- UGC-INFLIBNET occupied the first position their overall sources of e-resources used as their secured and followed by DELNET
- that most of the students 625 respondents (51.70%) are satisfied with all e-resources they are getting from the identified sources.
- The most common problem faced by the users is that more no of respondents 384 (31.75%) of slow Internet access speed which takes a lot of their slot time to retrieve the relevant information.
- most accessible information resources were: Textbooks 83 (83%), followed by Newspapers and Magazines
- it was found that 24 (24%) used serials materials on a daily basis, 16 (16%) used textbooks and Online Databases each.
- 30 (30%) of the respondents agreed that it takes much time to search for materials needed in the library which is the highest figure on the challenges of accessing/using the library.
- Findings revealed high level of satisfaction by the respondents with the library resources: Reference materials 60 (60%), E-books 56 (56%), OPAC 55 (55%), Online Databases 54 (54%).

**Conclusion**

An analysis of the present study shows that almost all the users visit the library. Though the documentary and non-documentary sources are sufficient but the frequency of use of sources like encyclopedia, patents, reports and directories is very low. Non- documentary sources are less used perhaps owing to lack of awareness or inconvenience is use of these resources. Present day libraries are giving more emphasis to e-library approach.

The study was undertaken to investigate the availability, accessibility, and utilization of information resources by students and staff. The use of information resources by students would be enhanced if the resources adequately catered for the

various needs of students. The findings reveal more information resources were available than can be accessed for efficient utilization by students. As a result, the library provided book resources that were not fully accessible to students for maximum utilization.

The study showed that the library has some collection of information resources mainly as print materials. It also reflects a dearth amount of resources to offer students, albeit, provided resources able to support students academically. Students often utilize information resources such as textbooks, serials, and the internet as mainly available and accessible in near adequate amounts. Presently, the major information resources (print/books) shows the library is yet to integrate technology as a primary information provider. Students' use of internet proves the library needs to provide technology and digital information resources so as to improve the availability and accessibility of information resources for students to utilized other than the ones provided in current print format. There is a growing need to redirect focus towards expanding the library sources to take advantage of technology to enhance library stock and improve available, accessible, and utilizable information resources for students in this age of technological advancement and dependence is not out of place.The use of electronic information sources for study and research purposes must be encouraged and proper training should be organised from time to time. This is a comprehensive study of the use of e-resources by students. It is hoped that its findings would help the colleges and its libraries in framing its policies and programmes related to e-resources to facilitate teaching and research.

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# Open Access Sources and Information Services duringPost-Covid times in Nimar Region -A Case Study

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## ABSTRACT

*The present age is the age of technology and information. The spread oftechnology has made access to information easier, cheaper and faster. The lasttwo years came under the grip of Covid-19. During this some ways were closedand some new paths opened. Due to the imposition of lockdown and the closureof educational institutions, the trend of using new information servicesincreased. These services are based on Internet technology called Open Access Sources and Information Services. What will be the status of these services afterthe Covid period? This is the subject of study and research. In the article, a case study of the status of Open Access Sources and Information Services in the post-Covid19 period of Nimar region of Madhya Pradesh is being presented.*

**Key words**- *Open Access Sources, post covid period, Nimar region,internet,gazettesetc.*

## INTRODUCTION

Covid-19 has affected the world in every field. Innumerable people died.The first two waves of this epidemic were very dangerous, the third wave sooncame under control and is ending at this time. Many countries of the world hadto face long lock down to prevent infection of Covid-19. It felt like the wheel oflifehadstopped.

Necessity is the mother of invention. When the direct exchange ofknowledge and sources of knowledge was blocked, other methods werediscovered or the use of alternative methods already in existence wasencouraged. The use of technology also increased in the field of study andteaching. Under this, the trend of open access sources and information servicesalso increased.

## MEANINGOFOPEN ACCESS

AccordingtoUNESCO -

"By 'open access' to the literature, we mean its free availability on thepublic internet, permitting any users to read, download, copy, distribute, print,search, or link to the full texts of these articles, crawl them for indexing, passthem as data to software, or use them for any other lawful purpose, without financial,legal,ortechnicalbarriersotherthanthoseinseparablefromgaining accesstotheinternetitself."

The Berlin Declaration on Open Access to Knowledge in the Sciences andHumanities, Open access (OA) means free access to information and unrestricted useof electronic resources for everyone. Any kind of digital content can be OA,from texts and data to software, audio, video, and multi-media. While most ofthese are related to text only, a growing number are integrating text withimages, data, and executable code. OA can also apply to non-scholarly content,likemusic,movies,andnovels.

A publication is considered in openaccess if:

- its content is universally and freely accessible, at no cost to the reader,viathe Internetorotherwise;
- the author or copyright owner irrevocably grants to all users, for anunlimite period, the right to use, copy, or distribute the article, on condition that proper attribution is given;
- it is deposited, immediately, in full and in a suitable electronic form, atleast one widely and internationally recognized openaccess repository committed to open access."

## Nimar Region of Madhya Pradesh

Madhya Pradesh is also included in 28 states of India. To its south-west isthe Nimar region. There are four districts in this region- Khargone, Barwani, Khandwa and Burhanpur. More than 1.5 lakh students are studying in 27government colleges here. Apart from this, there are more than four lakhstudents in private colleges and schools. other readers and youth, preparing forcompetitiveexaminationsisalsoinlakhs.

**Thepopulationstatusinthesefourdistrictsisasfollows:**

| No. | District | Population | Literacy |
|---|---|---|---|
| 1 | Barwani | 1385881 | 49.08 |
| 2 | Khargone | 1873046 | 62.70 |
| 3 | Khandwa | 1310061 | 66.39 |
| 4 | Burhanpur | 757847 | 64.36 |
| Total | | 5326835 | |

## Meansfor Open AccessinNimarrigion

There are about 15 lakh smart phone users in the Nimar region. The number of users of computers and laptops is around one million. All of the muse the Internet and have open access facilities. Free Wi-Fi facility is available in the campus in fifteen of the twenty-seven government colleges of the district.These include Lead Colleges located at all four-district headquarters. Students on campus are able to access information without using their own internet data. Almost all the colleges have computer labs due to the facility of Studyingcomputer Science at The Undergraduate Level. Open Access Is Being Done in theselabsduetointernetfacility.

## Challengesandproblems

It was found in the study that the practice of Open Access Sources and Information Services in Nimar is still less as compared to developed states of India or even developed areas of Madhya Pradesh like Malwa.It is clearly visible from the above table, that the percentage of literacy isvery low in all the four districts of this region. This is a major reason why the use of modern technology is less. The mentality of the majority of the population of Nimar region is traditional and it is still more inclined towards collecting information from books. Awareness among people in this area is also relatively low. Even in the absence of the right website or source information for the right material, this immeasurable store of knowledge is not being utilized. Poverty is a big challenge. It is not possible to use advanced gadgets duetopaucity offunds.Also,thereis a lack ofmoneyto spendoninternetdata.

## FutureProspects

Thereisnodoubtthatthetimesto comearegoingtobemoretechnologyintensive. Continuous progress is being made in the field of information technology. All the best books of the world are available in digital form and continuous work is going on in this direction. As stated by UNESCO, its scope is very wide and all types of digital content can be open accessed. Through a small device, all the world's wealth of knowledge is accessible to human beings, what can be better than this? While carrying the burden of many books or resources is inconvenient, it is also relatively expensive. So, it is obvious that the old method will be left behind and the trend of open access will continue to grow in the Nimar region as well. Internet data has become very cheap after the arrival of Jio and the number of Internet users has also started increasing. Due to competition in this area, Internet service is likely to become more progressive and cheaper, so thiswillalsoincrease thepossibilityofopen access.

## Conclusion

It is clear from this case study that at present the use of Open AccessSources and Information Services in Nimar region is comparatively less. The Covid period has made people aware of this. It is more convenient and its cost isalso less, hence its trend is increasing with time. The coming time is of OpenAccess SourcesandInformationServices.

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# Downloading and installing of Reference Management Tools

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**Abstract :**

*For the present study Eight Reference Management Tools have been selected i.e. Citavi, EndNote, JabRef, Mendeley, Papers, Qiqqa, RefWorks and Zotero. For the analysis of Reference Management 12 parameters have been identified while downloading and working into the software. researcher has identified the mode of downloading reference management softwares operating system compatibility browser connectors integration with word processing system requirements for the downloading cloud storage space internet browser connectivity*

**Keywords**: *internet browsers, system requirements, reference management software*

## Introduction :

All the researchers are familiar with different kinds of reference styles that APA, MLA and so many. Each reference style has its own style of rendering of bibliographical information it is extremely difficult to learn, and many times researchers get confused and also it is time consuming. Most of the time researchers doing mistakes in writing references due to lack of proper citation style and then problem arises of plagiarism. RMS tools which is not only used in doing or creating reference styles but also it has various functions that is useful to the researchers. list of various tools available online researchers can choose any of them according to their requirement.Researcher has done study brief about how to download and install and requirement for installing and downloading reference management tools The use of Reference Management Tools in terms of storage, import bibliography and import text files from the computer itself. Authors has reviewed the use of RMS tools by the health science users. Author has been discussed various criteria's selection of software and requirements. So many RMS tools available in the market hence users can select useful for the study**Nashelsky&Earley (1991).** Indexing can be done with the help of Endnote plus because it has given various metadata files, author publication, volume journal file and issue of journals. Endnote plus has

given searching facility directly from the software**Miller, M.C (1994).**The use of RMS in the year 2004. In version EndNote 7.0 was used palm operating system for download. It includes 38 citation styles. The author has explained that only one EndNote library can be stored on personal digital assistants at a time, and endnote was designed specially to work with palm hardware**Glassman, N.R (2004))**.Reference Management Software to the Firefox browser that is LiBiX and Zotero. Zotero Reference Management Software can offer web 2.0 features than other RMS Tool. Zotero users can sort, tag, annotate and search these citations.

Zotero reference management software and how it work within web 2.0. Zotero can meet the needs of advanced information management.Zotero can create vast databases of bibliographic information. Users can cite papers in their research paper. It is open-source software and is constantly updated. Zotero has bookmarking facility hence users can locate the documents easily. RSS feeds facility updated in the Zotero in the year 2009. User can synchronize their libraries from multiple computers, and it does not require constant internet access**Fernandez, P (2011).**

Literature published on Reference Management Tools from 1980 to 2014. In this paper 37 articles were reviewed. Various keys were used for retrieve articles like "Reference Management Software", Citation Management Software, Citation Tools, Citation, and Reference. Authors has used Web of Science, Scopus, Google Scholar, Delnet for retrieve data. This article author concluded that there is no standardized method for analysis. After the year 2000 has been increased scholarly articles on RMS. Author were identified types of articles published on Reference Management Software which includes description of RMS, comparative description of RMS tools and Quantitative comparison of Tools. Most of the literature was published on medicine, social sciences, science and technology and humanities, library, and information science. Total seventeen evaluation oriented in the reviews conducted. Library Science has not given that much contribution in both the technical or theoretical aspects. Review observed that Library Science has failed to lead in this area of research**Tramullas, Jesus. And Garrido, P (2015)**.ReTracker application to flag withdrew articles with high accuracy, precision, and recall, while not flagging articles that discuss retractions and not flagging retraction notices. Zotero was chosen to apply ReTracker application for inserting articles from the PubMed database. This application has worked better while retraction of metadata into Zotero**Cheng, Yi-Yun, et al.(2019)**. Library of RDA COVID-19 WG to support development of the RDA COVID-19 Data Sharing Recommendations and Guidelines. The Zotero Library covers resources and reference like clinical, community, epidemiology, Indigenous, legal and ethics, social, and software**RDA-COVID19 Zotero (2020)**.

**Table No1. URL of selected Reference Management Tools**

| Sr. No | Name of the Reference Management Software | Link of Website |
|---|---|---|
| 1 | Citavi | https://www.citavi.com |
| 2 | EndNote | https://endnote.com |
| 3 | JabRef | https://www.jabref.org |
| 4 | Mendeley | https://www.mendeley.com |
| 5 | Papers | https://www.papersapp.com |
| 6 | Qiqqa | http://www.qiqqa.com |
| 7 | RefWorks | https://www.RefWorkss.com |
| 8 | Zotero | https://www.zotero.org |

**Aim of the study** : researchers most of the times get confused in downloading and installing stage. If researchers can get proper information about the requirements for installing reference management software and it will save the time of the users.

**Objectives :**

1. To identifymode of downloading of selected RMS Tools
2. To find out compatibility of operating system for the selected RMS Tools
3. To check browser connectors of RMS Tools
4. To check integration with word processing facility by Reference Management Tools.

**Research methodology:**

online practice method was selected to identify the requirements for downloading and installing of Reference Management Tools that i.e. Citavi, EndNote, JabRef, Mendeley, Papers, Qiqqa, RefWorks, and Zotero. Study parameters developed based on practices in that particular software.

**Use environment/mode of downloading Reference Management Software:** The term refers for the use of reference managers with or without internet. It allows users to install reference manager and practice online, offline or both the environments.

**Table No. 2 Use environment/mode of downloading Reference Management Software**

| Sr No | Use environment | Online | Offline | Both Online/Offline |
|---|---|---|---|---|
| 1 | Citavi | Yes | NO | No |
| 2 | EndNote | Yes | Yes | Yes |
| 3 | JabRef | No | Yes | No |
| 4 | Mendeley | Yes | Yes | Yes |
| 5 | Papers | Yes | Yes | Yes |
| 6 | Qiqqa | Yes | Yes | Yes |
| 7 | RefWorks | Yes | No | No |
| 8 | Zotero | Yes | Yes | Yes |

Table No2 indicates that the JabRef Reference Management Software available for the offline use only. EndNote, Mendeley, papers, Qiqqa and Zotero Reference Management Software can be used both the environment by the users. RefWorks and Citavi Reference Management Software available for the online use only.

**Oprating System Compatibility**: "An operating system (OS) is system software that manages computer hardware, software resources, and provides common services for computer programs". The first job of the users is to check whether this system supports to the selected reference manager for the installation. To identify that the selected RMS tool supports to the Window Operating System, Mac Operating System, Linux oprating system, for installing Refernce Management Tool.To check selected Reference Management Software supports to IoS application like iphone,ipad, ipod touchand Android application for installation.

**Table No.3 Operating System Compatibility of Reference Management Software**

| Sr. No | Name of the software | Microsoft Window | Mac | Linux | iOS | Android app |
|---|---|---|---|---|---|---|
| **1** | **Citavi** | Yes | No | No | No | No |
| **2** | **EndNote** | Yes | Yes | No | Yes | No |
| **3** | **JabRef** | Yes | Yes | Yes | No | No |
| **4** | **Mendeley** | Yes | Yes | Yes | Yes | Yes |
| **5** | **Papers** | Yes | Yes | No | Yes | Yes |
| **6** | **Qiqqa** | Yes | No | No | No | Yes |
| **7** | **RefWorks** | Yes | Yes | Yes | No | No |
| **8** | **Zotero** | Yes | Yes | Yes | Yes | Yes |

Table No3 shows that EndNote, Mendeley, Zotero and Paper supports to the IOS application. Mendeley, Paper, Zotero and Qiqqa supports to android application for the installation. All the selected Reference Management Tools support to the Window operating system. Citavi, JebRef and Qiqqa does not support to the Mac Operating system. It is determined that the many of the RMS tools does not support to the Mac operating system for installation of reference manager.Citavi, EndNote, paper and Qiqqa reference managers do not support to Linux operating system for the installation.

**Browser connectors: "**small software module for customizing a web browser. Browsers typically allow a variety of extensions for importing articles, web pages, imges etc.". It allow user to insert required document in the refernce manager from the internet.

**Table No.4 Browser connectors of Reference Management Software**

| Sr. No | Name of reference management software | Browser connector | Name of the Browser connector |
|---|---|---|---|
| 1 | Citavi | Yes | Citavi picker |
| 2 | EndNote | No | - |
| 3 | JabRef | No | - |
| 4 | Mendeley | Yes | Web importer |
| 5 | Papers | No | - |
| 6 | Qiqqa | No | - |
| 7 | RefWorks | No | - |
| 8 | Zotero | Yes | Zotero connector |

Table No 4. shows that Citavi reference manager provides Citavi picker, Mendeley provides web importer and Zotero provides Zotero connector as a browser connector for the inserting documents in the software. EndNote, JabRef, Papers Qiqqa and RefWorks do not have browser connector competence.

**Integration with word processing system:** It is a software on desktops (personal computers) allow users to insert citations and bibliography in the word file because creating bibliography is only half task of citation process. Users have to identify

that identify that the selected RMS tool supports the Microsoft Word to insert intext citation at the time of writing a research paper.

**Table No5.integration with word processing facility by Reference Management Tools.**

| Sr. No | Name of reference management software | Word Processor Connector | Name of the word processor connector |
|---|---|---|---|
| 1 | Citavi | Yes | Citavi picker |
| 2 | EndNote | Yes | Cite While You Write |
| 3 | JabRef | No | - |
| 4 | Mendeley | Yes | Mendeley cite |
| 5 | Papers | Yes | Smart cite |
| 6 | Qiqqa | No | - |
| 7 | RefWorks | Yes | Write N Cite |
| 8 | Zotero | Yes | Zotero connector |

Table No5. represent that out of eight, six Reference Management Tools offers integration with word processing system. All Reference Managers require the download add-on/plug – in. After integrating it to word processor. It indicates as additional feature in ribbon pane. It's having options for Add/Edit Citation, Add/Edit Bibliography, Document Preferences, Refresh and Unlink Citations under it. It saves time of the user. Only the JabRef and Qiqqa reference managers does not offers.

**System requirements for the Reference Management Tools:**

System space required for downloading and installing Reference Management Software in Megabytes or Kilobytes. Latest versionprovide all the updated features to the users. Last date of updategives surety of latest updates in the refrence manger**.** Cost shows that the seleted reference manager free or should pay for it by the users**.**

**Table No6 System Requirements for the Reference Management Tools**

| Sr no | Name of software | Space required for installing | Latest version | Last date of updatation | Cost |
|---|---|---|---|---|---|
| 1 | Citavi | 279MB | V6.3 | 28/07/2020 | Free |
| 2 | EndNote | 600MB | X9.3 | 11/06/2019 | 24210/- |
| 3 | JabRef | 188MB | 5.1.6 | 10/03/2020 | Free |
| 4 | Mendeley | 57.5MB | 1.19.4 | 2018 | Free |
| 5 | Papers | 92.4MB | 4.6.1 | 14/07/2020 | $60 |
| 6 | Qiqqa | 146MB | 7.9 | 09/2020 | $6.67 |
| 7 | RefWorks | Online | Online | 2018 | Individual $100 |
| 8 | Zotero | 109MB | 5.0.92 | 22/7/2020 | Free |

Table No6 shows that Zotero offers open source version to the user andrequire minimum storage space for the installation. RefWorks do not offer offline to individuals' membership users and it is commercial software. Mendeley reference manager requires lower storage space in comparison to others Reference Management Tools but it is not updated since 2018. EndNote reference manager requires more storage space in comparison to others for the installation.

**Cloud Storage space limit:** Cloud storage spaceallow user to save and access refernces from the online registered account. It can be in GB , MB and unlimited storage capacity. Cloud storage space varies on every refernce manager. Each Reference Management Software has its own capacity to save users research data online.

**Table No6 Cloud storage space limt of selected RMS Tools**

| Sr. no | Name of the software | Storage space |
|---|---|---|
| 1 | Citavi | 3GB |
| 2 | EndNote | 5GB |
| 3 | JabRef | 00MB |
| 4 | Mendeley | 2GB |
| 5 | Papers | 5 GB |
| 6 | Qiqqa | 200MB |
| 7 | RefWorks | 5 GB |
| 8 | Zotero | 300MB |

Table No6 Shows that EndNote, Paper, RefWorks gives more cloud storage space to save online records as compared to Citavi, JabRef, Mendeley, Qiqqa and Zotero.

**Internet browser connectivity: "**it is a software application for accessing information from the World Wide Web".

**Table No 7 Internet Browser Connectivity**

| Sr No. | Name of the software | Google chrome | Firefox | Internet explorer | Safari |
|---|---|---|---|---|---|
| 1 | Citavi | Yes | Yes | Yes | No |
| 2 | EndNote | Yes | Yes | Yes | Yes |
| 3 | JabRef | Yes | Yes | No | No |
| 4 | Mendeley | Yes | Yes | Yes | Yes |
| 5 | Papers | Yes | Yes | Yes | Yes |
| 6 | Qiqqa | Yes | Yes | No | Yes |
| 7 | RefWorks | Yes | Yes | Yes | Yes |
| 8 | Zotero | Yes | Yes | No | Yes |

Table No7. indicates theEndNote, Mendeley, Papers and RefWorks supports Chrome, Firefox, Internet Explorer, and safari. JabRef Supports only Firefox and Chrome. Zotero and Qiqqa do not support to Internet Explorer. Citavi reference Manager does not support to Safari browser

**Findings :**

- IOS applications identified by the EndNote, Mendeley, Zotero and Papers for the installation.
- Android app users can use only Mendeley, Paper, and Qiqqa reference management tools on their mobiles.
- There is no technical issue on installation of selected 8 reference management tools on the window operating system.
- Most of the reference managers does not export documents directly from the internet in the software.
- EndNote reference manager requires more storage space in comparison to others for the installation.
- RefWorks offers more storage space which can store required data related to research which includes journal articles, books, images, and newspaper clippings.

**Conclusion:**It is concluded that most of the Reference Management Software available both the online and offline environment. Zotero reference management software is the best in all the conditions of downloading and installing stage but it is not providing more cloud storage space for saving literature online.

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# A Study on Indianmanuscripts.com ,an Open Access Indian Manuscripts Initiative

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## Abstract

*This paper provides an overview of the resources available on indianmanuscripts.com website an open access initiative of Indian manuscripts. This paper discusses about the Manuscripts, Antique books, Bishnoi manuscripts, VedVedant, SantKabir Manuscripts, Jain manuscripts, Palm leaf Tamil Manuscripts, Ancient documents, Tamrapatra, Bhojpatra, Gurmukhi manuscripts available on the website and all those resources are arranged according to the subject and separate accession code has been given to every subject. There are 4082 manuscripts and antique books are found on the website and 1, 50, 000 pages of these valuable documents are digitized and available for the scholars and researchers for their study.*

***Key Words:*** *Manuscripts, Antique Books, Ved-Vedant, Palm Leaf Manuscripts, Gurmukhi.*

## Introduction

Manuscripts are treasure of our ancient knowledge conservation and preservation of these valuable resources is need of the hour. India is a country of unique and rich cultural heritage of knowledge. Used variety of materials to write and store its heritage for the coming generations i.e. birch leaves, palm leaves, clay tablets, paper made from cotton etc. Rig Veda is written about ten thousand years ago which is the oldest written document in the world. In this paper studied about the indianmanuscripts.com which is having more than 1,50,000 e-pages of manuscripts and antique books of Indian Literature, Ayurved, Religion, Miniature, Indian Music, Yoga, Puran, Jurisprudence, Ved, Vedant etc. All the available resources on the website are accessible freely without any cost to the interested people, scholars and researchers throughout the world. This website is unique in nature and openly accessible to all without any barrier, but strictly prohibited for downloading and

copying of the manuscripts. The resources are categorised under the ten headings i.e. Manuscripts, Antique books, Bishnoi Manuscripts, VedVedant, SantKabir Manuscripts, Jain Manuscripts, Ancient Documents, Palm leaf Tamil Manuscripts, Tamrapatra / Bhojpatra and Gurmukhi - Punjabi Manuscripts. Those are analysed in detail in this paper. The people and institutions also contribute and share their collections of their original Indian manuscripts, Ancient documents, inscriptions, antique books etc to the indianmanuscripts.com.

## Objectives of the study

- To know the existing resources provided by the website
- To know the subject wise manuscripts and rare books available in the website
- To know about the manuscripts availability andaccessibility of the website
- To introduce the website to the research fraternity through this paper

## Methodology

The main aim of this study is to analyse the available manuscripts and rare books on indianmanuscripts.com. The required data has collected from the website www.indianmanuscripts.com and analysed the same data in simple mathematical and theoretical analysis. The present study is limited to available data on Indianmanuscripts.com.

## About the indianmanuscripts.com

Indianmanuscripts.com is one of the largest collections of the manuscripts available in open access for the students, scholars and researchers of the world also the first in its kind and only detailed website on Indian manuscripts, antique books, historical ancient documents and inscriptions. Indianmanuscripts.com is the only website that has given each manuscript an attractive cover page according to its subject matter, which provides the full details of the script. The website is not only for manuscripts it has books published before independence. Currently the website has 1, 50, 000 e-pages of the original ancient Indian scripts and all these pages can be accessible without any charges for research and academic purpose. And the people also contribute the resources if they have. The founder Shri Madan Mohan Gupta proudly dedicated the indianmanuscripts.com to the researchers and scholars who are insatiably wandering in pursuit of knowledge. The website does not encourage the buying and selling of the any ancient scripts and the downloading of any script is strictly prohibited. Photocopies of the resources are available for personal study and for research with nominal rates.

## The sacred objectives of the website

- To provide ancient manuscripts and books for free online reading to researchers and seekers of Indian knowledge around the world
- To digitize very rare original ancient texts written by doing their original thinking and continuous austerity, sadhana, practice and calculation, try to keep them safe.

## Sitemap

The website is categorised its resources into 10 main headings and number of documents present on the website are as follows;

- Manuscripts - 2759
- Antique Books - 493
- Bishnoi Manuscripts - 305
- VedVedant - 223
- SantKabir Manuscripts - 108
- Jain Manuscripts - 114
- Ancient Documents - 7
- Palm leaf Tamil Manuscripts - 17
- Tamrapatra / Bhojpatra- 6
- Gurmukhi - 50

**Screenshot – 1: indianmanuscripts.com home page**



## Data Analysis and Interpretation

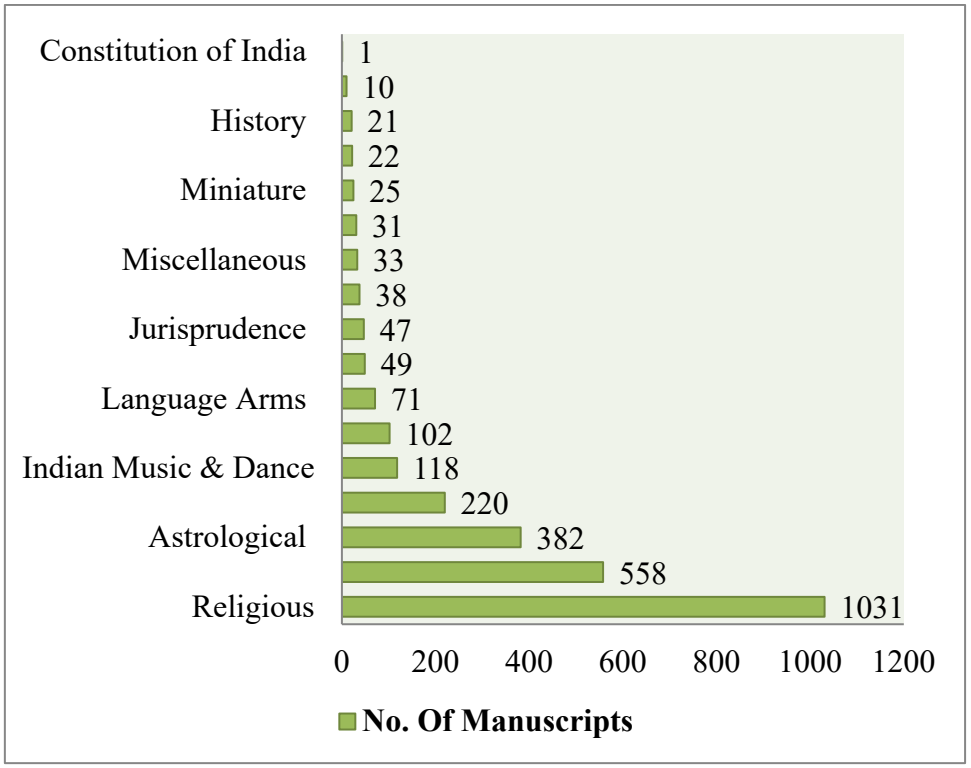
### 1. Manuscripts

The available Manuscripts are listed in the below table 1, the religious manuscripts tops the list with 1031 manuscripts followed by the yantra, mantra and tantra with 582 manuscripts and astrological manuscripts with 382. In total 2759 manuscripts are available on indianmanuscripts.com with free access to the interested and researchers for the study. Some of the popular manuscripts titles are Ayurved Prakash, Prachin Ayurvedic Chikitsa, Geometrical Mathematics, MuhurtaChintamaniGargSanhita, PatanjaliBhasya etc. The manuscripts arranged according to the subject wise with descending order in below table.

Table – 1: Subject wise Manuscripts available on the website

| SL. No. | Manuscripts | No. Of Manuscripts | Accession Code |
|---|---|---|---|
| 1 | Religious | 1031 | MRE |
| 2 | Yantra, Mantra, Tantra | 558 | YMT |
| 3 | Astrological | 382 | MAS |
| 4 | Literature | 220 | MLI |
| 5 | Indian Music & Dance | 118 | MIM |
| 6 | Ayurved | 102 | MAR |
| 7 | Language Arms | 71 | BSH |
| 8 | Puran | 49 | PRN |
| 9 | Jurisprudence | 47 | UMS |
| 10 | Yoga | 38 | MYO |
| 11 | Miscellaneous | 33 | MMI |
| 12 | Lokot (Scroll) | 31 | LKT |
| 13 | Miniature | 25 | MIN |
| 14 | Kaam Shastra | 22 | KAM |
| 15 | History | 21 | MHI |
| 16 | Writings of Indian Legends | 10 | WIL |
| 17 | Constitution of India | 1 | --- |
| | **Total** | **2759** | |

Chart – 1: No. Of Manuscripts available in website

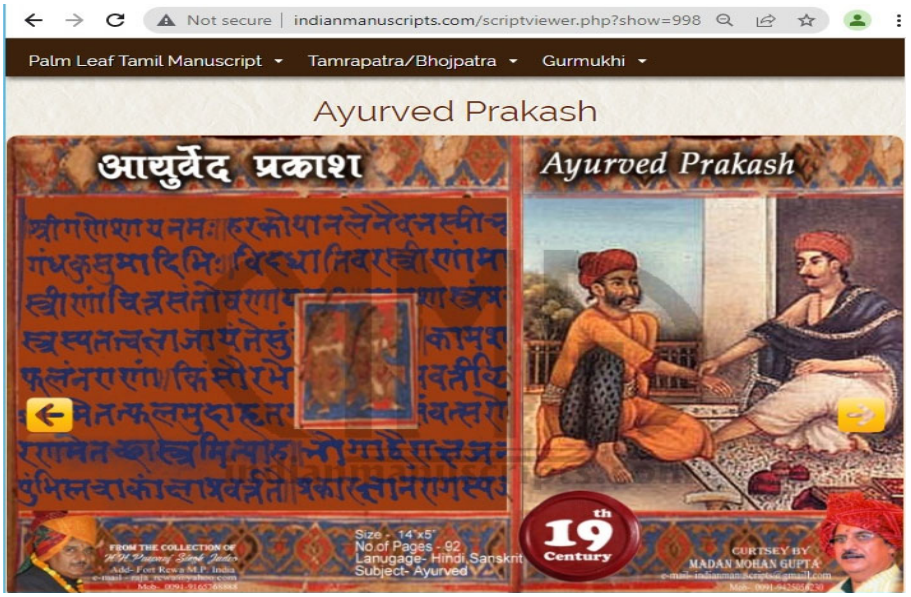



Screenshot – 2: Religious Manuscripts page 1(Source: indianmanuscripts.com)

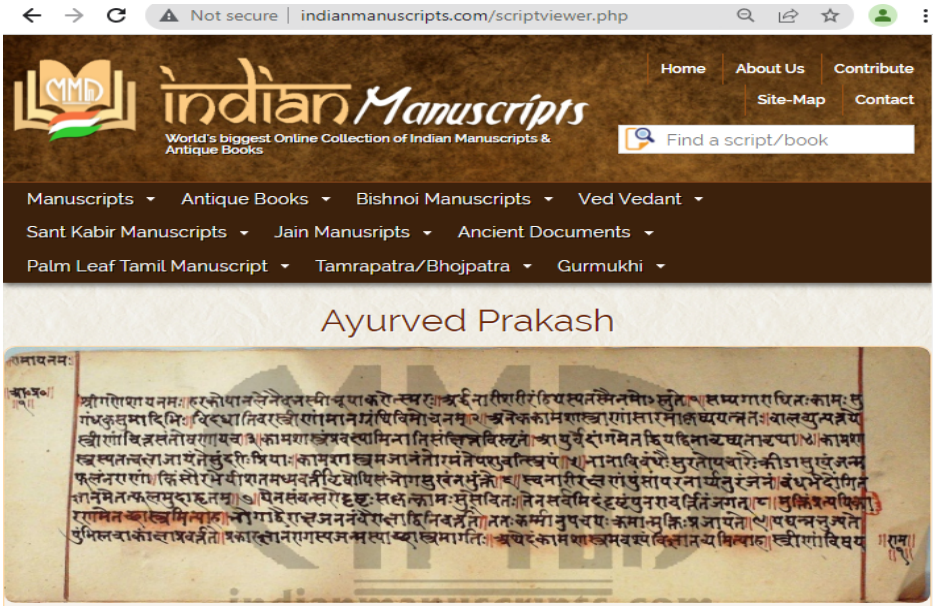


The below screenshots shows the sample pages of the manuscripts which are available on the Indianmanuscripts.com.

Screenshot – 3 & 4: Sample pages of the manuscripts (Source: indianmanuscripts.com)




Screenshot – 4



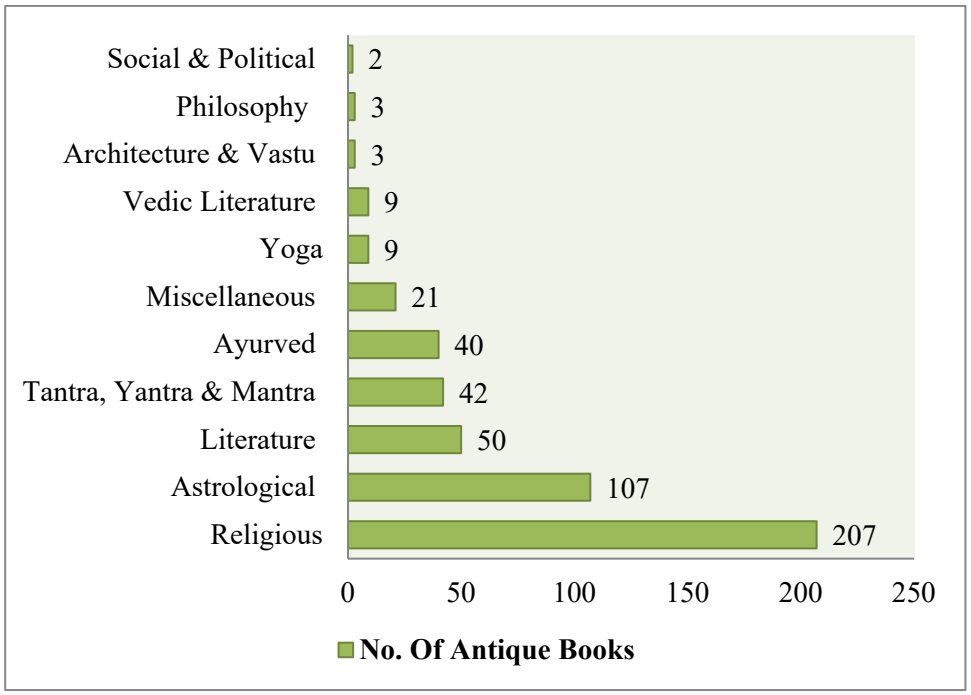
## 2. Antique Books

The table 2 shows the details of subject wise antique books availability on the indianmanuscripts.com. Again the religious book tops the list with 207 followed by astrological books with107 and literature with 50 antique books. In total 493 antique books are uploaded in website and available for the access to the interested. Some of the titles of the antique books are ShiovMahimaStotra, Urdu Ramacharitamanas, Yoga Chintamani, and General Policy of Gwalior Darbar, Antique Indian Wall Paintings, Hindi Bhasha or Lipi etc.

Table – 2: Subject wise Antique Books available on the website

| SL. No. | Antique Books | No. Of Antique Books | Accession Code |
|---|---|---|---|
| 1 | Religious | 207 | ABR |
| 2 | Astrological | 107 | ABA |
| 3 | Literature | 50 | ABL |
| 4 | Tantra, Yantra& Mantra | 42 | ATM |
| 5 | Ayurved | 40 | ABA |
| 6 | Miscellaneous | 21 | ABM |
| 7 | Yoga | 9 | ABY |
| 8 | Vedic Literature | 9 | ABV |
| 9 | Architecture &Vastu | 3 | ABV |
| 10 | Philosophy | 3 | --- |
| 11 | Social & Political | 2 | --- |
| | **Total** | **493** | |

Chart – 2: No. Of Antique books available on website




Screenshot – 5: Astrological Antique Books page 1 (Source: indianmanuscripts.com)



## 3. Bishnoi Manuscripts

BishnoiPanth was founded by Guru Jambheshwarji (1451-1536) who has given 29 commandments to preserve and protect environment in humanitarian values. Related to this community there are 305 manuscripts are recorded in indianmanuscripts.com. There are 11 manuscripts are there on Guru Jambheshwarji and his teachings. There are 12000 original pages of ancient bishnoi manuscripts. Some of the titles of the manuscripts are JambheshwarShabad Vani PrasangSahit, ParmanandjikaPothaJhambaSanhita, UpdeshPachisi etc.

## 4. VedVedant

There is a separate category for the subject ved and vdant. One of the oldest written texts Rigveda found in the collection which has 1028 hymns and 10600 verses. On ved there are 31 resources are available and vedant 192 manuscripts are available on the website. Some of the titles of the manuscripts are Rig Veda Samhita, PurushSuktam, Dandak, MayavadKhandan, Vedaant Saar, Madukya Upanishad etc.

## 5. SantKabir Manuscripts

SantKabir is an Indian mystic poet of 15$^{th}$ century he is a saint and one of the greatest philosopher. He is well known for being critical of Hinduism and Islam, his legacy survives and continues through the KabirPanth. Kabir's most famous writings dohas or couplets are listed in indianmanuscripts.com. There are 108 manuscripts were found on the website. Some of the tiles of the SantKabir Manuscripts are Hit Updesh, AdharDori, Padma Puran, Holi Bhajan, KabirVaani etc.

Screenshot – 6: SantKabir Manuscripts page 1 (Source: indianmanuscripts.com)



## 6. Jain Manuscripts and Antique Books

Jain dharma is an ancient Indian religion. Jains trace their spiritual ideas and history through a succession of twentyfour victorious saviours and teachers known as Tirthankaras. The first Tirthankara is Rishabhanatha and the 24th Tirthankara is Mahavira. On the website indianmanuscripts.com there 114 numbers of manuscripts and antique books related to Janism are found to be digitized and open to the readers. Some of the tiles of the manuscripts and antique books are Veer BhanuUdayKavyam, SamvartSmati, AhinsaSangrahanama, Saritsagar, KiratarjuneeyamKalpasutra etc.

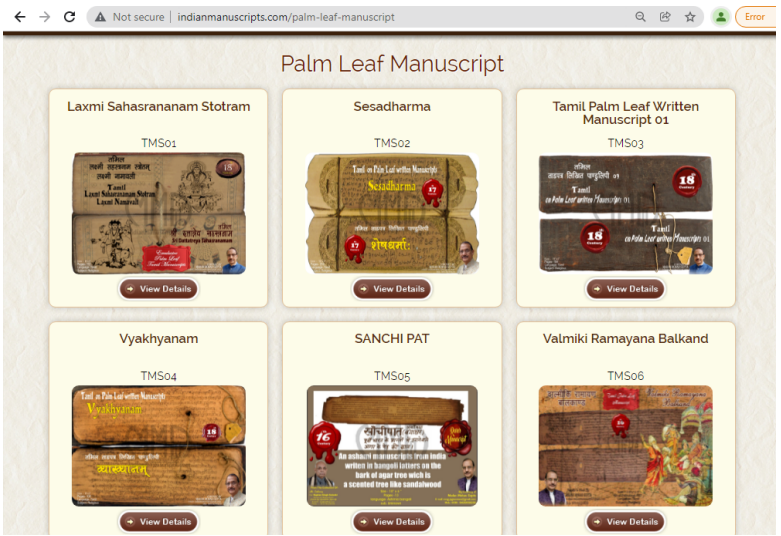
## 7. Ancient Documents

Ancient documents are found in indianmanuscripts.com those are categorised as Ancient Letters and Ancient Documents. There is a letter (post card) and there are 6 documents i.e. partition document, revenue document, Political documents are recorded on the website those are accessible to the users of the website.

## 8. Palm Leaf Tamil Manuscripts

There are 17 palm leaf Tamil manuscripts are available in digital form on the website. Some of the titles are as follows LaxmiSahasranamStotram, Sanchi Pat, Vyakhyanam, Valmiki Ramayana, GadyatrayamParamapadaSopanam etc.

Screenshot – 7: Palm Leaf Manuscripts page 1 (Source: indianmanuscripts.com)



### 9. Tamrapatra/Bhojpatra

Tamrapatra and Bhojpatra also found on the website those are categorised as Copper Plated Rare Manuscripts (1 Manuscript) and BetulaUtilis Rare Manuscripts – BhojpatraDurlabh 5 manuscripts available in digital form.

### 10. Gurmukhi – Punjabi Manuscripts

Gurmukhi is the script of Punjabi language which is used in Punjab Region. There are 50 Punjabi Manuscripts are available in indianmanuscripts.com. The titles of the manuscripts are Jaap Sahib, Bhagavad Gita, Megh Mala, ChanakyaGranth, Vedic Sukt, Vedanta Prakriya, DarmParichha etc.

### Findings and Conclusion

The major findings of the study are as follows;

- The website is digitized over 1, 50, 000 e-pages of the manuscripts and antique books.
- There are 2759 manuscripts on various subjects i.e. astrology, religion, yoga, ayurved, history, miniature, jurisprudence etc.
- The indianjournals.com has the collection of 493 antique books on various subjects i.e. religion, astrology, literature, yoga,ayurved etc.
- There are 12000 pages of Bishnoi Manuscripts are accommodated in the website for access of the scholars and researchers.
- VedVedant, SantKabir Manuscripts, Jain manuscripts, Palm leaf Tamil Manuscripts, Tamrapatra/Bhojpatra and Gurmukhi manuscripts with various valuable resources are digitized and kept on website for the access of the interested and research scholars.

- The colour photocopies of the manuscripts can be obtained from the institute with Glaze Paper which will cost Rs. 50 per page in A-4 size, Rs.25 per page and Rs.20 per page on Normal Paper.
- If the photocopies required in original size instead of A4 size then Rs.5 per page. Additional fee will be payable in the form of resetting of contents and paper cutting. The rate of Rs.60 per book will be payable extra for Spiral Binding.

The indianmanuscripts.com is unique in its kind and one of the largest online databases of Indian manuscripts available in open access to the scholars and researchers. It's very useful for the interested people, scholars and researchers. The founder and the management is did a laborious and costly task. The team went on to every corner of a vast country like India to collect information about the manuscripts and other resources after all the requests to get the manuscripts scanned, studied, classified and then making their cover page according to the subject of the manuscript and then uploaded to the website. So users can easily access lakhs of pages of the manuscripts and antique books in one platform i.e. indianmanuscripts.com.

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# Contribution of Asian Countries in Open DOAR

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**Abstract:**

*This study is analytical study of open access repositories in the Asia Continent enrolled in OpenDOAR; Directory of Open Access Repositories. Total 30 Asian Countries are analysed having OARs. The finding disclosed that Japan has the highest number of OARs followedby Turkey, Indonesia and India. It is also come to know that D-space is most popular software for creation and management ofOpen Access Repositories. By this study it is come to know there are various types of softwares used for creation of Repositories, total 18 softwares found by this study, it is also displayed that Asian countries contribution in OpenDOAR worldwide. Total 5772 Repositories are available in which 1349 Repositories from Asian Continent.*

**Keywords:***DOAR. Open Access,OpenDOAR, Institutional Repositories, Asia***,**

## 1 Introduction:

The Concept "open" itself disclosed its meaning that it is for sharing for free, and easy access for its users. And open access is is for to share the resources for free, easy access to stakeholders and it avoids restrictive policies. A place where scholarly contents are stores in significant quantities is called "a repository", it is become as knowledge management by individual institution.(Kuri& Singh, 2020). All over the world the big issue is how to manage the research output and now its become necessary and need to manage the scholarly contents in effective way and so on Open Access Institutional Repositories are the best and ultimate option , it will open up the up the research out put to each and every one.

In the Digital World by the growth of information research scholars faces lots of problems and challenges to maintain scholarly contents. Digital world is changing

the modes of Research scholarly communication and so on digital platform provides opportunities for researches to work in collaborative and manner.(Karadia& Sahoo, 2021)

**About OAR:**

Open Access Repositories gaining popularity because its advantage is that it this platform provides worldwide audience to the scholarly contents. Open Access Repositories: It is Defined as " A Collection of Full Text Documents Available in online databases on the Internet can be accessed freely and instantly", it promote scholarly communication.(Xie& Matusiak, 2016).As per the Wikipedia – An OAR is a digital Platform that maintained research output and provide it free of coast, with immediate and permanent access to research result for anyone to use, download and distribute.(*Open-Access Repository - Wikipedia*, n.d.)

**About OpenDOAR :**

Open DOAR is global Directory of Open Access Repositories. It is service provider which provides access to the repositories from across the world.OpenDOAR host mostly institutional Repositories that provide open and free access to academic and intellectual outputs and resources. This service is launched in year 2005 – the product of a collaborative project between the University of Nottingham and Lund University, it is funded by OSI, Jisc, SPARC Europe and CURL. OpenDOAR provides help desk for their user we can email at help@jisc.ac.uk.(*About OpenDOAR - v2.Sherpa*, n.d.).OpenDOAR is a UK based website with hosts' academic open access repositories. In which anyone can search repositories by Country Name, Software Used for Repositories, Contents, OAR statistics Alphabetical Directory is available on website and some tools and support facility is provided for the user is there.

**Objectives of the Study:**

- To find out contribution of Asian Countries in OpenDOAR
- To find out how much Asian countries not enrolled inOpenDOAR.
- Types of Repositories (Asian Countries)
- To find out various types of Software used for building Repositories.

- Compare the Contribution of Asian Repositories with Worldwide repositories available on OpenDOAR.

**Scope:** This Study is limited to only Asian Countries' Open Access Repositories (OAR) available on Directory of Open Access Repositories (OpenDOAR).

**Methodology:**

This Study is based on Quantitative Data from websites of OpenDOAR, Data were collected between 15thJanuary to 24th January 2022. Data were collected by internet searching and it is analysed on selected parameters – Asian countries distributed by their sub regions, contribution of their in OpenDOAR, Software used to build OARs, Type of Repositories, Quantity of Repositories and Comparison of contribution of Asian Countries with all OARs available in OpenDoar. For these study Asian countries details are taken from two websites and verified. Total 48 Asian Countries are listed in the study.(Shavili, n.d.) which are identified on OpenDOAR websites.https://www.worldatlas.com/articles/how-many-countries-are-in-asia.html and https://www.worldometers.info(Worldometer, n.d.)

## Data Analysis:

**Table 1 :List of Asian Countries & their contribution in the OPEN DOAR**
**Source: https://v2.sherpa.ac.uk/view/repository_by_country/**(*Browse by Country and Region - v2.Sherpa*, n.d.)

| Sr.No. | Asian Countries Name | Presence in Open DOAR | Regions | Quantity OAR |
|---|---|---|---|---|
| 1 | Afghanistan | YES | Southern Asia | 1 |
| 2 | Armenia | YES | Western Asia | 2 |
| 3 | Azerbaijan | YES | Western Asia | 2 |
| 4 | Bahrain | No | Western Asia | 0 |
| 5 | Bangladesh | YES | Southern Asia | 15 |
| 6 | Bhutan | No | Southern Asia | 0 |
| 7 | Brunei | No | South- Eastern Asia | 0 |
| 8 | Cambodia | No | South- Eastern Asia | 0 |

| | | | | |
|---|---|---|---|---|
| 9 | China | YES | Eastern Asia | 64 |
| 10 | Cyprus | YES | Western Asia | 6 |
| 11 | Georgia | YES | Western Asia | 4 |
| 12 | India | YES | Southern Asia | 102 |
| 13 | Indonesia | YES | South- Eastern Asia | 163 |
| 14 | Iran | YES | Southern Asia | 18 |
| 15 | Iraq | YES | Western Asia | 3 |
| 16 | Israel | No | Western Asia | 0 |
| 17 | Japan | YES | Eastern Asia | 681 |
| 18 | Jorden | No | Western Asia | 0 |
| 19 | Kazakhstan | YES | Central Asia | 12 |
| 20 | Kuwait | YES | Western Asia | 1 |
| 21 | Kyrgyzstan | YES | Central Asia | 1 |
| 22 | Labanon | YES | Western Asia | 4 |
| 23 | Laos( Peoples' Democratic Republic) | YES | South- Eastern Asia | 1 |
| 24 | Malaysia | YES | South- Eastern Asia | 25 |
| 25 | Maldives | No | Southern Asia | 0 |
| 26 | Mongolia | No | Eastern Asia | 0 |
| 27 | Myanmar | YES | South- Eastern Asia | 3 |
| 28 | Nepal | YES | Southern Asia | 1 |
| 29 | North Korea | No | Eastern Asia | 0 |
| 30 | Oman | No | Western Asia | 0 |
| 31 | Pakistan | YES | Southern Asia | 4 |
| 32 | Philippies | YES | South- Eastern Asia | 9 |
| 33 | Qatar | YES | Western Asia | 1 |
| 34 | Saudi Arabia | No | Western Asia | 0 |
| 35 | Singapore | YES | South- Eastern Asia | 7 |
| 36 | South Korea | No | Eastern Asia | 0 |
| 37 | Sri Lanka | YES | Southern Asia | 16 |
| 38 | State of Palestine | YES | Western Asia | 8 |
| 39 | Syria | No | Western Asia | 0 |
| 40 | Tajikistan | No | Central Asia | 0 |

| | | | | |
|---|---|---|---|---|
| 41 | Thailand | YES | South- Eastern Asia | 17 |
| 42 | Timor-Leste | No | South- Eastern Asia | 0 |
| 43 | Turkey | YES | Western Asia | 172 |
| 44 | Turkmenistan | No | Central Asia | 0 |
| 45 | United Arab Emirates | YES | Western Asia | 5 |
| 46 | Uzbekistan | No | Central Asia | 0 |
| 47 | Vietnam | YES | South- Eastern Asia | 1 |
| 48 | Yemen | No | Western Asia | 0 |
| **Total** | | 1349 | | |

**Table 1 a) Analysis of AsianCountries as per sub region and quantity of OAR**

| Sr. No | Sub Region | Country Having repository | Country having No Repository |
|---|---|---|---|
| 1 | Central Asia | 2 | 3 |
| 2 | Southern Asia | 7 | 2 |
| 3 | Eastern Asia | 2 | 3 |
| 4 | South- Eastern Asia | 8 | 3 |
| 5 | Western Asia | 11 | 7 |
| Total | | 30 | 18 |

**Interpretation:** Table 1 and Table 1a shows directory of Asian countries, with their sub regions of countries. Total 48(Forty eight Countries are divided into 5 Sub regions as Central Asia having 5 countries in total 2 (Two) with OARs, Southern Asia having 10 countries in total and 7(seven) having OARs, Eastern Asia stands with 5 countries and 2(Two) countries with OARs, South-Eastern Asia having 11 countries and 8(eight) countries having OARs and Western Asia having 19 countries in total, 11 (Eleven) having OARS.. In the above table Quantity of OARs are displayed as it is found that total 30 Asian Countries out of 130 countries are contributed in OpenDOArworldwide. Having the Contribution in OpenDOAR.

Table 1 shows that Japan with 681 OARs, India with 102 OARs, Indonesia stands with 163 OARs, Turky stand with 172 OARs.

**Table 2 : Software Used for Developing Repositories**

| | | Name of Software | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Sr. No** | **Country** | CONTENTdm | Cybersis | CRIS | D-Space | Digital Commans | Drupal | Digitool | E-Print | Eamas | Fedora | GreenStone | Invevio | Omeka | Other | Open Repositories | Unspecified | WEKO | XOONIPS |
| 1 | Afganistan | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | √ | X | X |
| 2 | Armenia | X | X | X | X | X | X | X | √ | X | X | √ | X | X | X | X | X | X | X |
| 3 | Azerbaijan | X | X | X | √ | X | X | X | X | X | X | X | X | X | X | X | X | X | X |
| 4 | Bangladesh | X | X | X | √ | X | X | X | X | X | X | √ | X | X | X | X | X | X | X |
| 5 | China | X | X | X | √ | X | X | X | X | X | X | X | X | X | √ | X | √ | X | X |
| 6 | Cyprus | X | X | X | √ | X | X | X | X | X | X | X | X | X | X | X | X | X | X |
| 7 | Georgia | X | X | X | √ | X | X | X | X | X | X | X | X | X | X | X | √ | X | X |
| 8 | India | X | X | √ | √ | X | √ | X | √ | X | X | √ | X | X | √ | X | √ | X | X |
| 9 | Indonesia | X | X | X | √ | √ | √ | X | X | X | X | X | X | √ | √ | √ | X | √ | X |
| 10 | Iran | X | X | X | √ | X | X | X | √ | X | X | √ | X | X | X | X | X | X | X |
| 11 | Iraq | X | X | X | X | X | X | X | √ | X | X | X | X | X | √ | X | √ | X | X |
| 12 | Japan | X | X | X | √ | X | X | X | √ | √ | √ | X | X | X | √ | X | X | √ | √ |
| 13 | Kazakhstan | X | X | X | √ | X | X | X | X | X | X | X | X | X | X | X | X | X | X |
| 14 | Kuwait | X | X | X | √ | X | X | X | X | X | X | X | X | X | X | X | X | X | X |
| 15 | Kyrgyzstan | X | X | X | √ | X | X | X | X | X | X | √ | X | X | X | X | X | X | X |
| 16 | Labanon | X | X | X | √ | X | X | X | √ | X | X | X | X | X | √ | X | X | X | X |
| 17 | Laos( Peoples' Democratic Republic) | X | X | X | √ | X | X | X | X | X | X | X | X | X | X | X | X | X | X |
| 18 | Malaysia | X | X | X | √ | X | X | X | √ | X | X | √ | X | X | X | X | √ | X | X |
| 19 | Myanmar | X | X | X | √ | X | X | X | X | X | X | X | X | X | X | X | X | X | X |
| 20 | Nepal | X | X | X | √ | X | X | X | X | X | X | X | X | X | X | X | √ | X | X |
| 21 | Pakistan | √ | X | X | √ | X | X | X | X | X | X | √ | X | X | √ | X | X | X | X |
| 22 | Philippies | X | X | X | √ | X | X | X | X | X | X | √ | X | X | √ | X | X | X | X |
| 23 | Qatar | X | X | X | √ | X | X | X | X | X | X | X | X | X | X | X | X | X | X |
| 24 | Singapore | X | X | X | √ | X | X | X | X | X | X | X | X | X | √ | X | X | X | X |
| 25 | Sri Lanka | X | X | X | √ | X | X | X | X | X | X | X | X | X | √ | X | X | X | X |
| 26 | State of Palestine | X | X | X | √ | X | X | X | X | X | X | X | X | X | X | X | X | X | X |
| 27 | Thailand | X | X | X | √ | X | X | X | X | X | X | X | X | X | √ | X | X | X | X |
| 28 | Turkey | √ | √ | √ | √ | X | √ | √ | √ | X | X | X | √ | X | √ | X | X | X | X |
| 29 | United Arab Emirates | X | X | X | √ | √ | X | X | X | X | X | X | X | X | X | X | X | X | X |
| 30 | Vietnam | X | X | X | √ | X | X | X | X | X | X | X | X | X | X | X | X | X | X |

**Table 2a : Analysis of software used for developing Repositories**

| Sr. No. | Software | No.of Countries using the Software | % |
|---|---|---|---|
| 1 | CONTENTdm | 2 | 6.66 % |
| 2 | Cybersis | 1 | 3.33 % |
| 3 | D-space CRIS | 2 | 6.66 % |
| 4 | D-Space | 27 | 90 % |
| 5 | Digital Commons | 2 | 6.66 % |
| 6 | Drupal | 3 | 10 % |
| 7 | Digitool | 1 | 3.33 % |
| 8 | E-Print | 8 | 26.66 % |
| 9 | Earmas | 1 | 3.33 % |
| 10 | Fedora | 1 | 3.33 % |
| 11 | Greenstone | 8 | 26.66 % |
| 12 | Invenio | 1 | 3.33 % |
| 13 | Omeka | 1 | 3.33 % |
| 14 | Other | 12 | 40 % |
| 15 | Open Repositories | 1 | 3.33 % |
| 16 | Unspecified | 7 | 23.33 % |
| 17 | WEKO | 3 | 10 % |
| 18 | XOONIPS | 1 | 3.33 % |
| Total | | 82 | |

**Interpretation:**Table 2 shows the data collected for software used by OARs and it is tabulated, it is found that there various types of software are used by OARs around 18 types were collected.Data is collected by and analysed in Table 2a which shows that 90% OARs used "D-Space", 40% OARs used software as "Other", 26.66% OARs used "Greenstone and E-Print", followed by 23.33% is noted as " Unspecified", 10% OARs used software " Drupal"

"CONTENTdm", "D-space CRIS", "Digital Commons" these Software's used by 6.66% OARs followed by 3.33% OARs usedXOONIPS, Open Repositories, Invenio, Fedora, Earmas,Digitool, Cybersis.
Table 2a shows that "D-Space" is most popular software among the OARs in Asian Countries OARs

**Table 3: Statement of Software used by Asian Country wise (Only takenhighest range of Software used as per Table2a )**

| Sr, No. | Software | No. Of OARs | % | Name of Countries |
|---|---|---|---|---|
| 1 | D-Space | 27 | 90% | Azerbaijan, Bangladesh, China, Cyprus, Georgia, India, Indonesia, Iran,Japan, Kazakhstan, Kuwait, Kyrgyzstan,Labonan, Laos, Malaysia, Myanmar, Nepal, Pakistan, Philippies, Qatar, Singapore, Sri Lanka, State of Palestine, Thailand, Turkey, UAE, Vietnams |
| 2 | Other | 12 | 40% | China, India, Indonesia, Iraq, Japan, Labanon,Pakistan, |

| | | | | |
|---|---|---|---|---|
| | | | | Philippies, Singapore, Sri Lanka, Thailand , Turkey |
| 3 | E-Print | 8 | 26.66% | Armenia, India, Iran,Iraq,Japan, Lebanon, Malaysia, Turkey |
| 4 | Greenstone | 8 | 26.66% | Armenia, Bangladesh, India, Iran, Kyrgyzstan, Malaysia, Pakistan, Philippies |
| 5 | Unspecified | 7 | 23.33% | Afghanistan, China, Georgia, India, Iraq, Malaysia, Nepal |
| 7 | Drupal | 3 | 10% | India, Indonesia, Turkey |
| 6 | WEKO | 2 | 7% | Indonesia, Japan, |
| 8 | D-space CRIS | 2 | 6.66% | India, Turkey |
| 9 | CONTENTdm | 2 | 6.66% | Turkey , Pakistan |
| 10 | Digital Commons | 2 | 6.66% | UAE and Indonesia |

**Interpretation**: Table 3 shows the Asian countries having maximum software used for building OARs to contribute in OpenDOAR. Total 27 (90%) countries are using D-Space followed by 12 (40%) countries using "other" softwares which are not specified in the websites.

**Table 4: Country wise Statement of Type of Repositories**

| Sr. No. | Country | Aggregating | Institutional | Disciplinary | Governmental |
|---|---|---|---|---|---|
| 1 | Afghanistan | X | √ | X | X |
| 2 | Armenia | X | √ | X | X |
| 3 | Azerbaijan | X | √ | X | X |
| 4 | Bangladesh | X | √ | √ | √ |
| 5 | China | √ | √ | √ | X |
| 6 | Cyprus | X | √ | X | X |

| | | | | | |
|---|---|---|---|---|---|
| 7 | Georgia | √ | √ | X | √ |
| 8 | India | X | √ | √ | √ |
| 9 | Indonesia | √ | √ | X | X |
| 10 | Iran | X | √ | √ | X |
| 11 | Iraq | X | √ | X | X |
| 12 | Japan | X | √ | X | X |
| 13 | Kazakhstan | X | √ | √ | √ |
| 14 | Kuwait | X | √ | X | X |
| 15 | Kyrgyzstan | X | √ | X | X |
| 16 | Labanon | X | √ | X | X |
| 17 | Laos( Peoples' Democratic Republic) | X | √ | X | X |
| 18 | Malaysia | X | √ | X | X |
| 19 | Myanmar | X | √ | X | √ |
| 20 | Nepal | X | X | √ | X |
| 21 | Pakistan | √ | √ | X | X |
| 22 | Philippines | X | √ | X | X |
| 23 | Qatar | X | √ | X | X |
| 24 | Singapore | X | √ | X | X |
| 25 | Sri Lanka | X | √ | X | X |
| 26 | State of Palestine | X | √ | X | X |
| 27 | Thailand | X | √ | √ | √ |
| 28 | Turkey | X | √ | X | X |
| 29 | United Arab Emirates | X | √ | X | X |
| 30 | Vietnam | X | √ | X | X |

**Table 4a : Analysis of type of Repositories**

| Sr. No | Type of Repository | No. Of Countries | Total Countries | % |
|---|---|---|---|---|
| 1 | Aggregating | 4 | 30 | 13 % |
| 2 | Institutional | 29 | 30 | 97 % |
| 3 | Disciplinary | 7 | 30 | 23 % |
| 4 | Governmental | 6 | 30 | 20 % |
| | Total | 46 | | |

**Interpretation:** Table 4 and Table 4a shows the statement of Types of Repositories, Repositories categorized in four types, Aggregating, Institutional, Disciplinary, Governmental. And it is found that There are 97% (27) repositories are Institutional, 23% ( 7) are comes under Disciplinary type, followed 20% (6) of Governmental Repositories and 13% (4) repositories are Aggregating type.

Table 4 shows that China, Georgia, Indonesia, Pakistan these countries having "Aggregating "Repositories. Only Nepal doesn't have Institutional Repository rest of all 29 Countries having "Institutional" type Repositories.

Bangladesh, Georgia, India, Kazakhstan, Myanmar, Thailand these 6 (six) countries having "Governmental" Repositories.

Bangladesh, China, India, Iran, Kazakhstan, Nepal, Thailand these 7(Seven) countries having "Disciplinary" type Repositories.

**Table 5 Country wise Descending order of Repositories (Quantity wise)**

**Contribution of Asian Countries on Worldwide and Asia Level**

| Sr. No. | Country | Quantity of OR | Open DOAR Quantity in Asia Region | % | Open DOAR Quantity in World | % |
|---|---|---|---|---|---|---|
| 1 | Japan | 681 | 1349 | 50.48 | 5772 | 11.79 |
| 2 | Turkey | 172 | | 12.75 | | 2.97 |
| 3 | Indonesia | 163 | | 12.08 | | 2.82 |
| 4 | India | 102 | | 7.56 | | 1.76 |
| 5 | China | 64 | | 4.74 | | 1.1 |
| 6 | Iran | 18 | | 1.33 | | 0.31 |
| 7 | Thailand | 17 | | 1.26 | | 0.29 |
| 8 | Sri Lanka | 16 | | 1.18 | | 0.27 |
| 9 | Bangladesh | 15 | | 1.11 | | 0.25 |
| 10 | Kazakhstan | 12 | | 0.88 | | 0.2 |
| Total | | 1260 | 1349 | | 5772 | |

Source :https://v2.sherpa.ac.uk/view/repository_by_country/ Accessed on 25th January 2022

**Interpretation:** Table 5 shows the percentage of their contribution in OpenDOAR on World level and Asia Level. It is found that Japan having highest contribution in Asian level , top with 50.48% of Contribution and 11.79% contribution on over all Open DOAR.

Turkey is on 2nd place with 12.75 % (172) of contribution in Asia level and 2.97 % on worldwide same with the Indonesia is on 3rdplace 12.08 % on Asia level and 2.82% on World level. India is on 4th Place highest contribution on Asia level with 7.56% and having 1.76 % contribution on world level.

**Conclusion:**This study findings shows that Japan has the largest 681Open Access Repositories listed in Asian Continents. Turkey is on 2nd position with 172 repositories, 3rd position Indonesia with 163 and India is on fourth with 102 repositories. It is also observed that and pointed out seriously with 18 Asian countries which don't have their presence in Open DOAR. There are mostly institution repositories and less number of aggregating,and governmental repositories , we should think over it and their is need to encourage the growth of aggregating and governmental repositories.

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# Use and perceptions of Remote Access Services (off-campus) among the users of Sri PadmavatiMahilaVisvavidyalayam, Tirupati.

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**Abstract:**

*This study intends to know the usage and perception of users on remote access service which is provided by the Sri PadmavatiMahilaVisvaVidyalayam, Tirupati. University library has been set up through KnimbusmLibrary digital platform which enables the users to access the subscribed resources remotely from anywhere, anytime from any device. Thus, it facilitates the maximal usage of e-resources in large libraries.A questionnaire-based survey was conducted. Questionnaires were sent to 350 registered users of remote access service of the library and 257 responses were received The study has identified the various benefits of remote access facility and the problems faced by the registered users to access subscribed e-resources remotely. After the investigation, the study suggested some important points for consideration.*

**Key words:** *Remote access service, e-resources, knimbus digital platform, perceptions, university library***.**

**Introduction**

Now academic Library is a collection of printed books and journals as well as electronic resources where both forms of the documents can be stored, retrieved and delivered as and when required. In present, the libraries have evolved from paper-based store house of books and journals into distributed network of digitized

information and knowledge, now known as digital libraries. E-resources are the back bone of any digital library. Due to the technological development, users' information requirements are becoming more specialized. Library users are keen in searching and retrieving information stored/viewed from a distance or stored in remote locations. The changing scenario of libraries is an outcome of present pandemic Covid-19 situation. The entire way of library services has been altered due to non-contact kind of facilitation to users. In this context, the technological advances have proven to be boon for libraries.

Remote Access in simple language is the ability to access a computer / server remotely through a network connection. • The users have much influence to work remotely away from the institution/ office while retaining access to a distant computer or network. • Remote Access can be applicable for Local Area Networks (LANs), Wide Area Network (WANs) and Virtual Private Networks (ability to access user computer from a remote location. Remote login access to e-resources is the best practice of any library. It gives an opportunity for the best use of the e-resources and offers easy access to various resources of the library through its interface from anywhere. Usually, in any library, access to subscribed e-resources is made available on user name and password or IP ranges/intranet environment which is limited to users staying inside the campus. Providing remote or off-campus to e-resources among user community wherever they reside is the need for the users of the library. Now providing remote access service facility is one of the objectives of any modern library and is the best way of maximizing the use of the library e-resources.

**Need of the study**

Sri PadmavatiMahilaVisvavidyalayam is one of the best women universities in India. It is in Tirupati with lush green area of 138.43 acres. In this University, the librarybuilding has capacity to accommodate 500 students at a time. Besides the comfortable seating and reading environment, the library is well equipped with modern facilities such as access to internet and web resources including online journals and e-books. Access to the subscribed e-resources of SPMVV Library(shown in table 1) has been set up through KnimbusmLibrarydigital platform which enables the users to access the content from anywhere, anytime from any device. In this regard, now work with remote users (both faculty and students) with their unique characteristics, needs, and expectations. To promote

user satisfaction, the library staff need to better understand users and their needs as well as enable users to meet those needs.
Therefore,this study is needed:

- To identify the users requirement for any modification or changes in the remote access facility provided by the library
- To know the reason or purpose for using remote access facility by the users
- To know whether users are facing any problem while accessing subscribed e-resources remotely
- To understand the benefits obtained by the users from the remote access facility.

**Table1: subscribed e-resources by SPMVV Library**

| Subscribed e-Resources |
|---|
| ➢ E-Sodhsindhu<br>➢ Electronic Political weekly<br>➢ ISID<br>➢ IEEE<br>➢ j-gate plus<br>➢ PNAS (Proceedings of National Science Academy)<br>➢ Elsiever<br>➢ Science Direct<br>➢ Pubmed<br>➢ Delnet |

## 1. Statement of the problem

The problem entitled as "Use and perceptions of Remote Access Services ( off-campus) among the users of Sri PadmavatiMahilaVisvavidyalayam, Tirupati".

## 2. Objectives of the study

The objectives of this study given below:

- To understand the perception of users on remote access services provided by the Sri PadmavatiMahilaVisvavidyalayam, Tirupati to access subscribed e-resources
- To know the level of Satisfaction of the users of remote access facility.

## 3. Scope of the study

The library has provided remote access facility to the faculty members, postgraduate students, and researchers of the sripadmavatimahilavisvavidyalayam, Tirupati. Keeping in view the enormity of the task, the scope this study is limited to cover the registered users of remote access facility at the Sri PadmavatiMahilaVisvavidyalayam library, Tirupati.

## Methodology

A Questionnaire survey was carried out to collect the data to understand the usage and perceptions of remote access users. Structured questionnaires were distributed among the registered users of remote access facility of the SPMVV library. Survey planet tool was used to design the questionnaire. The questionnaire was mailed to the registered users of remote access facility. 350 questionnaires were distributed to email addresses which are available for registered users and 257 responses were received.

## Analysis of Data

The study of population consisted of registered 350 users of remote access service at the SPMVV library. The percentage of response was 73.5%.

| Questionnaire distributed | Response received | Percentage |
|---|---|---|
| 350 | 257 | 73.5% |

## Position-wise Response

A question was asked to the registered users of remote access service in SPMVV Library, to reveal their present position. The respondents were stratified into four positions as faculty members, researchers and postgraduates and graduates' who were the target population of this study.

**Table2: Position wise response**

| Positions | users | Percentage |
|---|---|---|
| Faculty members | 57 | 22.18 |
| Researchers | 26 | 10.12 |
| Postgraduates | 125 | 48.63 |
| Graduates | 49 | 19.06 |
| Total | 257 | 100% |

The position standings of those in the sample 57 (22.18%) were faculty members, followed by Researchers26 (10.12%) postgraduate students 125 (48.63%) and Graduates 49(19.06%) .

**Awareness about remote access service**

A question has been put to the users to know their awareness about availability of remote access service which is provided by the SPMVV library. The responses given by them are shown in table 3.

**Table 3: Awareness about remote access service**

| Responses | users | Percentage |
|---|---|---|
| Yes | 257 | 100% |
| No | Nil | 0% |

Table 2 indicates that 100% (257) of respondents were aware of remote access service.

**Sources of awareness**

A question has been asked to the users to know about their sources of awareness of the availability of remote access services at the SPMVV library. The responses given by them are shown in table 4.

**Table: 4 Sources of Awareness**

| Responses | users | Percentage |
|---|---|---|
| Through library staff | 148 | 57.58 |
| colleagues | 24 | 9.34 |
| Webinars | 31 | 12.06 |
| Faculty members | 54 | 21.02 |
| Total | 257 | 100% |

The Table 4 shows that majority of the respondents (57.58%) were got awareness on remote access service through library staff whereas 21.02% of users are got

awareness through from faculty members, 12.06% of the users and 9.34% of users are got awareness of throughfrom their colleagues and webinars respectively.

**Using of Remote access facility**

A question has been put to the users to know how long they have been using the remote access service provided by SPMVVlibrary. The responses given by them are shown in the table 5.

Table 5: Using of Remote access facility

| Responses | users | Percentage |
|---|---|---|
| Recently | 48 | 18.68 |
| More than Six months | 124 | 48.24 |
| More than 3 months | 33 | 12.84 |
| Less than 3 months | 52 | 20.24 |
| Total | 257 | 100% |

Data presented in Table 4 indicates the percentage of users started using the remote access service at a various time. Mostof the respondents 124 (48.24%) were started using remote access facility from more than one year whereas 21.05% of users started using remote access facility recently

**Frequency of use**

A question has been put to the users to know their frequency of using the remote access service. The replies given by them are shown in the table 6.

Table 6: Frequency of use

| Responses | users | Percentage |
|---|---|---|
| Daily | 98 | 38.14 |
| Twice in a Week | 137 | 53.30 |
| Once in a Week | 22 | 8.57 |
| Monthly | 11 | 4.29 |
| Total | 257 | 100% |

Table 6 indicates that, the majority of respondents 137 (53.30%) are using remote access services 'Twice in a week', 38.14% of users are using Daily, 8.57% of users using Once in a week and only 4.29% of the users using monthly.

## Level of Satisfaction

A question has been asked to the users to understand their level of satisfaction with the Remote access service which provided by SPMVV Library. The replies given by them are shown in the table 7.

**Table7 : Level of Satisfaction**

| Responses | users | Percentage |
|---|---|---|
| Highly satisfied | 95 | 36.97 |
| satisfied | 139 | 54.08 |
| uncertain | 10 | 3.89 |
| Not satisfied | 11 | 4.28 |
| Highly not satisfied | 0 | 0 |
| Total | 257 | 100% |

Thistable depicts that 54.08% (139) of the respondents have stated that remote access service is satisfied, 36.97% (95) of users felt that it is highly satisfied ,4.28% (11) of users were felt that it is not satisfied and 3.89% (10) of users were felt uncertain about the satisfaction of the remote access service provided by SPMVV Library.

## Purpose of using Remote access service

A question has been asked to the users to know their purpose of using Remote access service. The replies given by them are shown in the Figure 2.

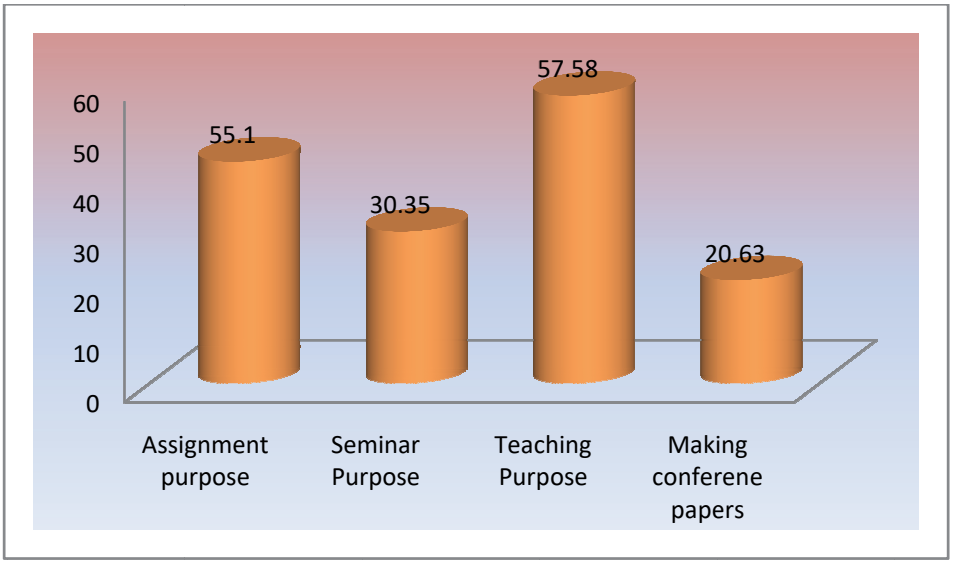



Fig: 1 Purpose of using remote access service
( Note : Allow them users to choose more than one option)

The Fig. 1 shows that majority of the respondents were using remote access facility for teaching purpose (57.58 %) followed by preparing Assignment purpose (55.1%), seminar purpose (30.35%) and Making conference papers (20.63%).

**Frequently accessing of e-resources providing by the library**

A question has been asked to the users to know about frequently accessing of e-resources which were subscribed by SPMVV Library. The replies given by them are shown in the table 8.

**Table 8: Use of subscribed e-resources of the library using remote access service**

| Types of e-resources | users | Percentage |
|---|---|---|
| Online databases | 52 | 20.24 |
| E-Journals | 124 | 48.25 |
| E-Books | 110 | 42.80 |
| Online lecture videos | 73 | 28.40 |

(Note: Allow them to choose more than one option)

Table 8 shows that the users were using remote access facility to access various types of library e-resources. Most of the users (48.25%) were using remote access facility for accessing e-journals, followed by 42.80% (110) and 20.24 % (25) of users using the same for accessing online databases and e-books respectively. It is also observed from the study that 28.40 % of users are using remote access facility to access online lecture videos.

**Problems while using the Remote access service**

A question has been asked to the users to know their problem while accessing the e-resources through this service. The replies given by them are shown in the table 6.

| Problems | users | Percentage |
|---|---|---|
| Links are not opening | 10 | 3.90 |
| Full text not downloading | 39 | 15.18 |
| Facing network problem | 20 | 7.79 |
| Limited pc's in library | 25 | 9.72 |
| Authentication problem | 20 | 7.78 |

(Note: Allow them to choose more than one option)

It is observed that, majority of the users (15.18%) are revealed the full text i not downloaded is major problem while accessing e-resources remotely. Followed by 'Limited Pc's in library' (9.72), "Network problem' (7.79) , Authentication problem (7.78%) and 3.90% of users stated that the links are not opening while accessing the e-resources remotely.

**Findings:**

The major findings of the study are listed out below:

- All the users have awareness about the remote access service which is provided by the SPMVV library, Howevera high percentage of the users were using this service twice in a week.
- It is observed that a high percentage of users (48.24%) started using remote access service since from more than six months
- Majority of the users (57.58%) were got awareness about remote access service through from the library staff.

- A high percentage of users (54.08%) were satisfied with remote access service provided by the SPMVV Library, followed by highly satisfied (36.97%), dissatisfied (4.28%), and uncertain (3.89%).
- It can be found that, Majority of the users (57.58%) were using the remote access for assignment purpose.
- A high percentage of the users (48.25%) were using remote access service for accessing e-journals to meet their information needs, followed by e-books (42.80%), online lecture videos (28.40%) and 20.24% of users were accessing online databases.
- Majority of the users (15.18%) were felt that full text is not downloading/opening is a major problem while accessing e-resources, . Followed by 'Limited Pc's in library' (9.72), "Network problem' (7.79) , Authentication problem (7.78%) and 3.90% of users stated that the links are not opening while accessing the e-resources remotely.

## CONCLUSION

Knimbus Digital platform provides a single point remote access to various subscribed resources of the library. Thus, it facilitates the maximal usage of e-resources in large libraries. From the findings of the study, it is observed that there is a strong demand for seamless access (without interruption) to e-resources subscribed by the library through remote access facility provided by the library. This study also understands the need to resolve the access problem while downloading the full-text articles from the online databases, e-journals, etc. remotely. These further calls for a solution to authentication problems while accessing e-resources remotely. It is, however, praiseworthy that SPMVV Library users are enjoying the remote access facility provided by the library. Most of the users felt that it is an excellent facility and helpful for them as they could access the resources of a library anywhere, any time and at any device.

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# Open Access Scholarly Communication by the Faculty Membersof NALSAR University of Law: A Study

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## Abstract

*This paper tries to showcase the research performance throughanalysing the open access researcharticleswritten by thefaculty members of the NALSAR University of Law. It finds out the availability of open access journalsand open access articlespublished by the faculty members. The articles were classified and accessibility of the articles on the web was examined. An attempt was made to discover the age of the articles and articles were distributed based on the designation of the faculty andsubjects of the articles. It was also observed the uniformity in the style of referencing the articles on the profile page of the faculty on the website.*

## Keywords

*Journals, Articles, Scholarly Communication, Open Access, Conventional, Law Faculty, Age*

## Introduction

Open access is, in general, a publishing practice of aninstitutionor an individual where output of the research like articles, papers, theses, etc, are provided with free access and also disseminatedthroughonlinewithout any monetary benefits. The articles will become popular and get cited by the others at ease and to a larger extent. Others of the same interest shall be able to refer and reuse it by giving proper credits to the original article.There are plenty of websites and directories maintained bysomeinstitutions which provide open access to its knowledge repositories. The open access movement has emerged with a lot of advantagesover the past decade.Thereare many efforts to showcase the quality of the research and scholarship of the institution. Theseinstitutions have always been looking for collaboration with others which havesimilar interests.

## NALSAR University of Law

The NALSAR (National Academy of Legal Studies and Research) University of Law is one of the National Law Universities in India was established in 1998 and located at Hyderabad, Telangana.It has the capacity of 120 seats for the admission of first year Law degreestudentsin an interdisciplinary manner. The five-year integrated undergraduate programme was introduced first by this university. It was placed at second in the rankings of the National Law Universities in India by the Week Magazine's assessment in 2019. It has a rich collection of Legal information resources in its library which includes textbooks, periodicals, journals, reports, manuals, databases, depository of United Nations collections, etc. These resources are accessible in its campus along with the bibliographic details through Online Public Access Catalogue.

The NALSAR has 19 research centres on various themes in the same discipline with appropriate aims, objectives and responsibilities. The research centres are N. C. Banerjee Centre for Intellectual Property Rights Studies, Dr. S. P. Chatterjee Centre for Environmental Law Studies, Centre for Constitutional Law, Public Policy and Good Governance, Centre of Excellence for Economics and Finance, Centre for Corporate Governance, Centre for Air and Space Law, Centre for Disability Studies, Centre for Family Laws, Centre for Legal Philosophy and Justice Education, and M K Nambyar SAARC Law Centre for Advanced Legal Studies.

The NALSAR has also published 11 Law journals at present to reveal its research productivity. The journals are namely Indian Journal of Air and Space Law, NALSAR ADR Journal, Journal of Corporate Affairs and Corporate Crimes, Indian Journal of Defence and Maritime Laws, NALSAR Law Review, Environmental Law & Practice Review, NALSAR Student Law Review, Indian Journal of Constitutional Law, Media Law Review, The Indian Journal of Law & Economics, and Indian Journal of Intellectual Property Law.

## Objectives of the Study

The following are the objectives of the study:

- To list out the articles written by the faculty members of NALSAR.
- To classify the articles as conventional and open access.
- To examine the accessibility of the open access articles on the web.

- To distribute the articles based on the subject and designation.
- To observe the uniformity in the style of referencing.
- To distinguish the articles according to theirage.

## Methodology of the Study

The authors havefirst visited the official website of NALSAR. It was navigated to the profile pages of the faculty members.It was listed on the website that 50 core/full time, 15 adjunct, and 20 visiting faculty members were working at present. The publications from only the core faculty members were listedon the website. Theyhavepublishednumbers and different forms of resources like book chapters, books, thesis, conference papers, newspaper articles, etc. Out of these only the articles published in journals which were required for the study were collected. The accessibility of these articles wasexamined on the web.Further,itwas classified and distributedbased on commercial, open access, print, and online access. As a next step, this data was entered into Microsoft Excel Software Sheets and then various basic mathematical and statistical methods were applied to get the required results of the study.

## Scope and Limitations of the Study

This paper was confined to only the NALSAR University of Law and the availability of the details of the publications of its faculty members on the website were considered for the study. The profiles of the faculty membersavailable in the official websitewereaccessedin the first week of February 2022. Though the faculty members published severaltypes of resources, only the research articleswereconsidered for data analysis. Other than the articles like books, chapters in the book, conference papers, newspaper articles, thesis, etc are excluded from the study.

## Analysis of the Data

The collected data from the web was tabulated and presented in the following graphs, charts, and table for better understanding and analysis.The sub headings were used to indicate the way in which data has been analysed.

### 6.1.Number of Open Access Journals and Conventional Journals

The below Figure- 1 clearly depicts the total number of open access journals and conventional/ print journals. The institution has published 9 open access and 2 conventional or print journals.

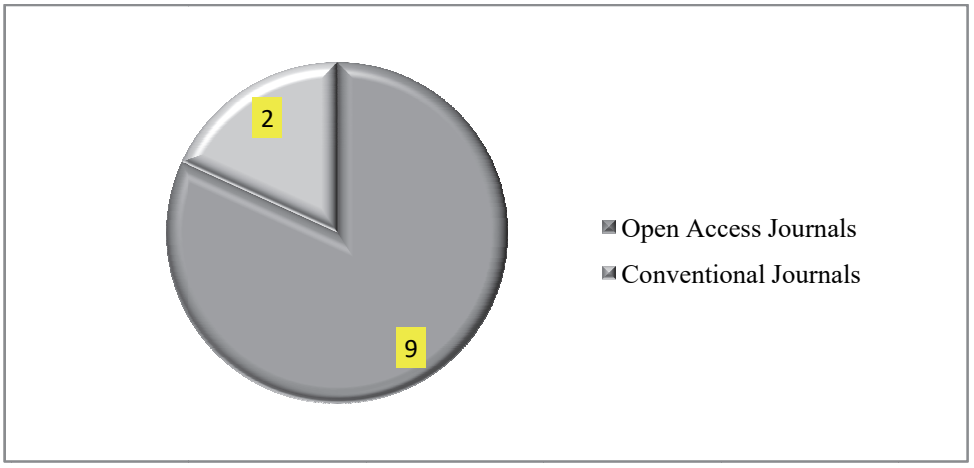



Figure -1: No. of Open Access & Conventional Journals

### 6.2.Strength of Faculty Members

The below Figure – 2depictsthat the NALSAR was enriched with the 50Core Faculty Members, 15 Adjunct Professors, 20 Visiting Faculty Members, and 85 in total. Apart from Law they also had the Pre-Law subjects such asHistory, Economics, Sociology, Political Science, English, Management, etc. They were needed to teach these Pre-Law so they requireAdjunct Professor and Visiting Faculty as well.

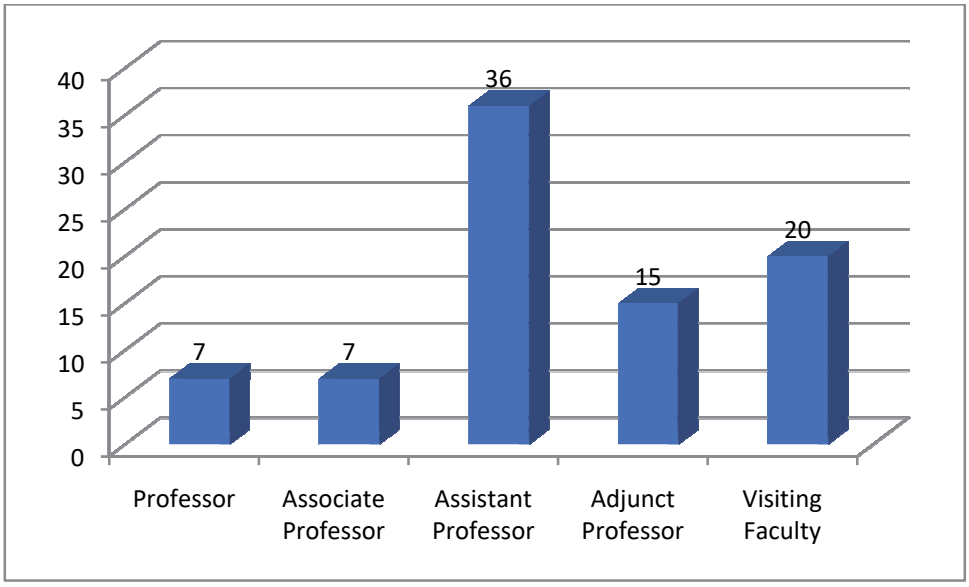



Figure – 2: Strength of Faculty Members

### 6.3.Contribution of Articles by the Faculty Members

The below Figure – 3depicts that even though there were experienced faculty members available in the institution, the visibility of their research output wasincomplete on the website. The faculty profile pages show that out of 50 core faculty members, intheLawsubjecttherewere only 6Professors, 5 Associate Professors, and 12 Assistant Professors hadwrittenarticles. In Pre-Law subjects only 2Associate Professorsand 12 Assistant Professors hadwrittenarticles. But in Law, 1 Professor and 6Assistant Professorswhowere listed on the web hadnot written articles. In Pre-Law subjects, 6 Assistant Professors had not written any articles.

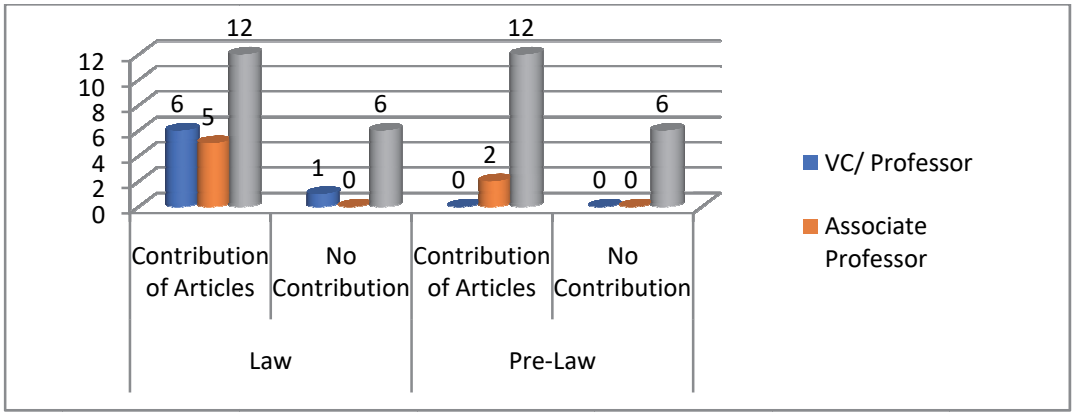



Figure – 3 :No. of Faculty Members Contributed the Articles

### 6.4.Total Number of Articles Contributed by Faculty Members

The Figure– 4 in below shows that the Professors had written24.5%, Associate Professors had written26.1% and Assistant Professors had written18.9% articles on Law subject. The Pre-Law Associate Professors had written10.4% and Assistant Professors had written20.1%articles insubjectsother than Law.A total number of 249 articles were the output of the research of these faculty members.

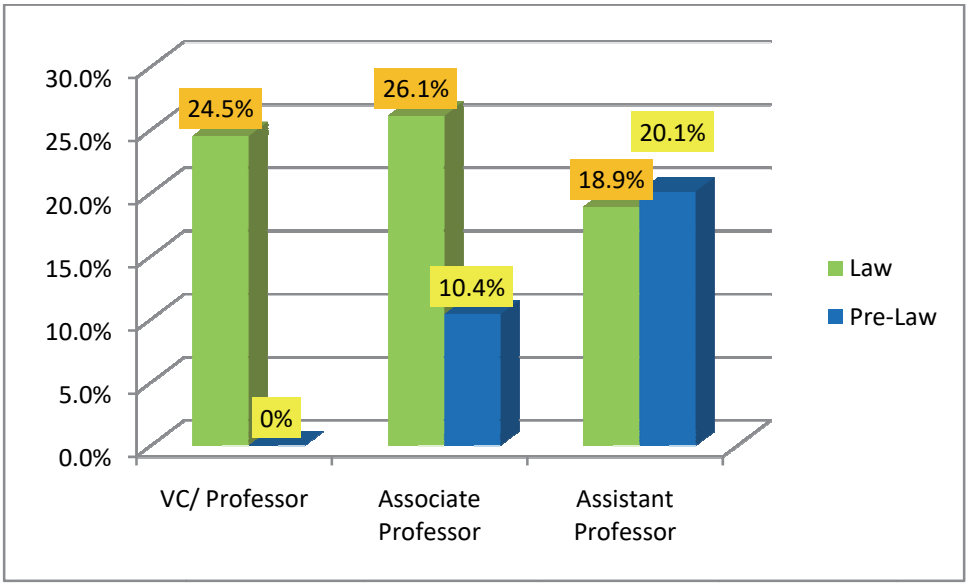



Figure – 4 :No. of Articles Contributed by Faculty Members

### 6.5.Distribution of Articles

In the below Figure – 5 it was depicted that the statistical comparison of open access and conventional articles were tabulated. Out of 249 articles 72 were in print format, 119 were accessible online and 58 were in both formats. Out of 249 articles 126 articles were open access and 123 articles were conventional.

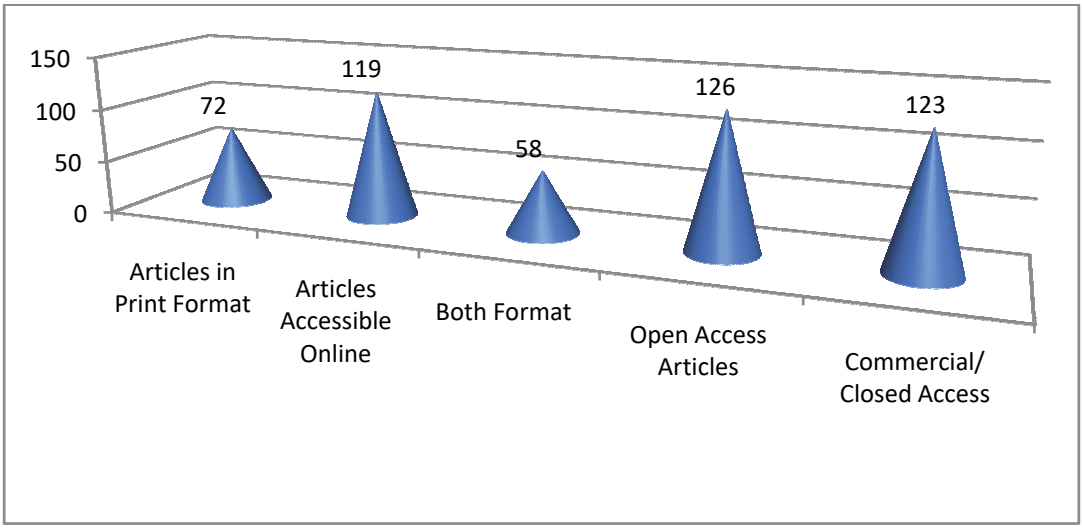



Figure – 5 :Distribution of Articles

### 6.6.Subject Wise Articles

As the institution had Law and Pre-Law faculty members and subjects for the learning and research it was also possible to distinguish the Law and Pre-Law articles. The below Figure-6 indicates69.5%articles were on Law subject and 30.5% articles were on Pre-Lawsubjects.

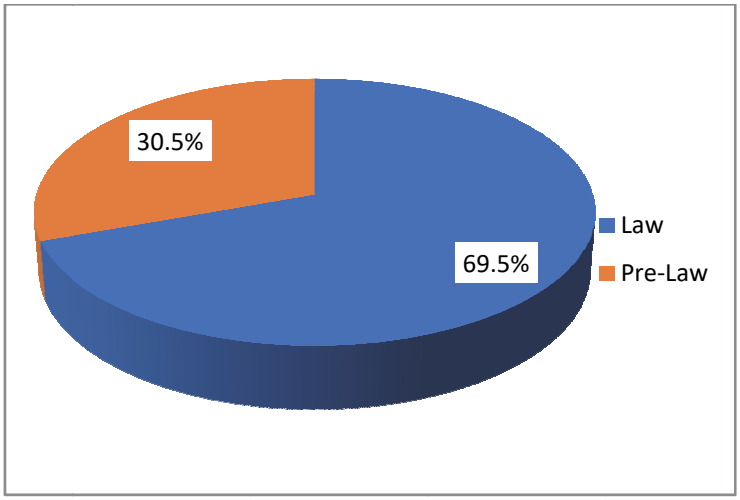



Figure – 6 :Subject Wise Articles

### 6.7.Number of Open Access Articles

Age of the articles is verymuch necessary to analyse the growth and obsolescence of literature in the past decades. The Table – 1depicts the growth of literature along with the year of publication. In the year 2016 there were 34 conventional articles published and at the same time there were only 9 open access articles published. Thehighest number of open access articles was 16 and thesewere published in the years2015 and 2005.

Table – 1 : Total Number of Open Access Articles

| Year | Total Articles | Open Access Articles |
|---|---|---|
| 2021 | 2 | 1 |
| 2020 | 4 | 1 |
| 2019 | 8 | 6 |
| 2018 | 30 | 11 |
| 2017 | 24 | 11 |
| 2016 | 34 | 9 |
| 2015 | 25 | 16 |
| 2014 | 23 | 11 |
| 2013 | 10 | 5 |
| 2012 | 10 | 4 |
| 2011 | 5 | 4 |

| Year | Total Articles | Open Access Articles |
|---|---|---|
| 2010 | 8 | 7 |
| 2009 | 4 | 3 |
| 2008 | 6 | 5 |
| 2007 | 5 | 4 |
| 2006 | 2 | 1 |
| 2005 | 3 | 16 |
| 2004 | 7 | 4 |
| 2003 | 2 | 0 |
| 2002 | 2 | 0 |
| 2001 | 0 | 0 |
| 2000 | 1 | 0 |
| <2000 | 34 | 7 |
| **Total** | **249** | **126** |

## Findings

The above analysis of the collected data in Figures 1 to 6 and in Table 1revealedthefollowingthings.The findings of the study are given below followed by the conclusion.

- It is good to found that 9 out of 11 were open access journals and made available online in the NALSAR website.
- Out of 50 core faculty members working at present,the Law faculty is 60% and the Pre-Law faculty is 40% in strength. The total number of Assistant Professors is higher than the Professors and Associate Professorsin both Law and Pre-Law subjects.
- The Assistant Professors have contributed39% ofarticles followed by Associate Professors 36.5% and Professors 24.5%in both Law and Pre-Law discipline.
- The open access articles were 50.6% when compared to 49.4% of conventional / print articles.The majority of the articles were written on Law subject in 69.5% than Pre-Law subjects in 30.5%.
- Good number of open access and conventional articles were published fromthe years 2014 to 2018 compared to any other years.
- It is observed that they have not followed one particular style of referencing in listing the articles in their profile page.
- It is also observed that the members of the faculty, research scholars, and students have shown interest to get the positive feedback on the research

progressto further advance the quality and visibility of the research.To meet this, they have created an Open Access Initiative webpage to enables the others to access working papers.

## Conclusion

This studyattempted to reveal the above findings.The collection of data based on the objectives of the study was achieved through the methodology adopted.By studying all these it is concluded that publishing open access journals and articles enables other researchers to refer to the articles and thus spread the light on the visibility of the progress of the research and its outcome.The Open Access Initiative webpage of NALSAR University of Law is an example for this. Itwill expand their visibility, quality,andcollaborationtothe next level in the area of research. As interdisciplinary research this paper is slightly connected with the Law subject.This study also gives the opportunities to undertake further research in the area of bibliometrics related to this study.

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- *Open Access. (n.d.). Retrieved February 2022, from https://en.wikipedia.org/wiki/Open_access*

## ***Annexure-NALSAR Publications***

### *Open Access Journals*

1. *NALSAR Law Review (ISSN 2319-1988)*
2. *Indian Journal of Intellectual Property Law (ISSN 2278-862X)*
3. *Environmental Law and Practice Review (ISSN 2319-1856)*
4. *Media Law Review (ISSN 2319-1848)*
5. *Journal of Corporate Affairs and Corporate Crimes (ISSN 2278-8611)*
6. *NALSAR Student Law Review (ISSN 0975-0216)*
7. *The Indian Journal of Constitutional Law (ISSN 0975-0134)*
8. *International Journal of Constitutional Law (IJCL)*
9. *NALSAR International Law Journal*

### *Print/ Conventional Journals*

1. *The Indian Journal of Law and Economics (ISSN 2319-1864)*
2. *NALSAR ADR Journal (ISSN 2348-7690)*

# Open Access Repositories In Roar &Doar: A Comparative Study

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## Abstract

*This article discusses the status of Open Access Repositories registered in ROAR (Registry of Open Access Repositories) databases, and DOAR (Directory of Open Access Repositories) databases by world countries. It also tabulates the usage of DSpace content management software across the world by the top used countries which are registered by the open ROAR and open DOAR databases*.

***KEYWORDS**: Open Resources, OpenROAR, OpenDOAR, Institutional Repositories, DSpace*

## INTRODUCTION

OpenDOAR and OpenROAR are directories of Open Access Repositories in global level sharing the resources. These directories host repositories that provide free, open access to academic outputs and resources worldwide. The open access repositories aim to promote and developmentthe open access information availability about growth and status of repositories throughout the world. One of themost used access and content management software is DSpace which is used around by the majority of world countries. This is a comparative study between ROAR ad DOAR directories to analyse usage of DSpace software interms of geographical distribution.

## OBJECTIVES

The main objective of this paper is to study the comparative of open access repositories

- To build a comparative statement regarding the contribution made by DSpace software towards open access repositories.
- To observe Geographical distribution of repositories of OARs by open Open ROAR and Open DOAR
- To identify the Country covered in Open ROAR and Open DOAR

## SCOPE

The data for the present study was collected exclusively from the "Directory of Open Access Repositories",DOAR (http://v2.sherpa.ac.uk/opendoar/) and "Registry of Open Access Repositories''ROAR(http://roar.eprints.org/).

## METHODOLOGY

The Open ROAR and Open DOAR databases are a collection of all the OARs available in the world as a whole. These databases are used here to extract the required objectives and present in the results in peculiar aspect. As on February 2022, there are 5820 repositories available in Open DOAR database and 4725 repositories available in Open ROAR database. The study concentrates on the selecting and analyzing of aforementioned objectives of Open Access Repositories in ROAR and DOAR databases.

## FINDINGS AND DISCUSSIONS

### *1.* Geographical Distribution of Repositories

Table 1revealsall the continents that are maintaining OARs in both ROAR and DOAR databases.124 Countries have registered their institutional repositories in both the databases. From the table after analysis it is identified that European Continent is the major contributor with 1927 institutions registered in ROAR and 1814 institutions registered in DOAR with 41 countries. Followed by Asian continent secures the second rank with 33 countries has 1125 registered in ROAR and 1457 in DOAR. It is closely followed by North America that has 1058 in ROAR and 1087 in DOAR with 5 countries. The fourth places is retained by South America with 9 countries, has 639 in ROAR and 598 in DOAR. African continent has 201 in ROAR and 237 in DOAR with 23 countries, Australian continent has 106 in ROAR and 108 in DOAR with 2 countries, Central America has 30 in ROAR and 35 in DOAR with 4 countries, Caribbean has 25 in ROAR and 26 in DOAR with 5 countries, Oceania has 3 in ROAR and DOAR with 2 countries. It is prominent that European continent have substantial number of Open access repositories in both ROAR and DOAR databases and possess the most number of institutional repositories respectively.

**Table 1: Continent wise Distribution of Open Repositories**

| Continent | No. of countries | No. of OARs | |
|---|---|---|---|
| | | ROAR | DOAR |
| Europe | 41 | 1927 | 1814 |
| Asia | 33 | 1125 | 1457 |
| North America | 5 | 1058 | 1087 |
| South America | 9 | 639 | 598 |
| Africa | 23 | 201 | 237 |
| Australia | 2 | 106 | 108 |
| Central America | 4 | 30 | 35 |
| Caribbean | 5 | 25 | 26 |
| Oceania | 2 | 3 | 3 |
| **Total** | **124** | **4725** | **5820** |

It could be found from this above table analysis, majority of countries were registered in open DOAR for open access repositories. Also found the majority of countries from European countries, Asian countries and North American countries respectively.

**Table 2: Country wise distribution of no. of OARs in ROAR and DOAR**

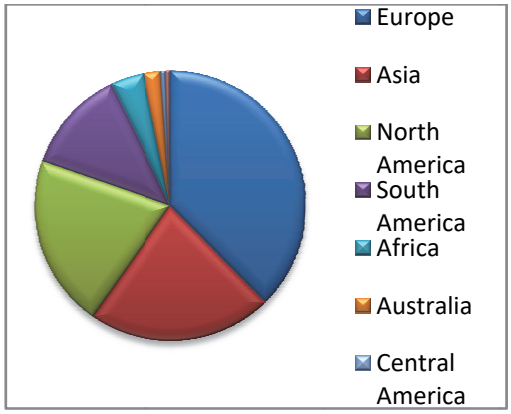
| Europe | No. of OARs | | Asia | No. of OARs | | South America | No. of OARs | |
|---|---|---|---|---|---|---|---|---|
| | ROAR | DOAR | | ROAR | DOAR | | ROAR | DOAR |
| UK | **262** | **318** | Japan | **242** | **681** | Brazil | **186** | **153** |
| Germany | 261 | 281 | Turkey | 164 | 172 | Columbia | 128 | 101 |
| Spain | 201 | 178 | India | 131 | 102 | Argentina | 72 | 75 |
| France | 102 | 161 | Taiwan | 83 | 60 | Peru | 161 | 175 |
| Italy | 98 | 140 | Indonesia | 175 | 163 | Ecuador | 31 | 38 |
| Poland | 128 | 128 | China | 96 | 65 | Chile | 27 | 27 |

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| Ukraine | 118 | 106 | Korea | 53 | 37 | Venezuela | 24 | 16 |
| Norway | 59 | 67 | Malaysia | 42 | 25 | Bolivia | 3 | 3 |
| Portugal | 62 | 62 | Thailand | 15 | 17 | Uruguay | 7 | 10 |
| Sweden | 76 | 50 | Sri Lanka | 2 | 16 | **Africa** | **ROAR** | **DOAR** |
| Greece | 41 | 39 | Bangladesh | 11 | 15 | South Africa | **52** | **48** |
| Hungary | 47 | 46 | Iran | 16 | 18 | Kenya | 30 | 44 |
| Netherlands | 46 | 74 | S.Arabia | 10 | 12 | Nigeria | 17 | 30 |
| Russia | 67 | 50 | Philippines | 15 | 9 | Algeria | 15 | 20 |
| Belgium | 37 | 33 | Singapore | 6 | 7 | Tanzania | 9 | 14 |
| Belarus | 34 | 38 | Hong Kong | 10 | 10 | Zimbave | 12 | 11 |
| Ireland | 27 | 30 | Kazakhstan | 10 | 12 | Sudan | 13 | 12 |
| Croatia | 7 | 148 | Georgia | 2 | 4 | Egypt | 12 | 9 |
| Switzerland | 30 | 38 | Kyrgyzstan | 4 | 1 | Ghana | 6 | 6 |
| Czech Rep. | 16 | 27 | Azerbaijan | 5 | 2 | Uganda | 8 | 12 |
| Austria | 27 | 47 | Iraq | 3 | 3 | Senegal | 2 | 4 |
| Finland | 23 | 23 | Armenia | 2 | 2 | Rwanda | 1 | 2 |
| Denmark | 17 | 15 | Palestinian | 7 | 8 | Namibia | 2 | 2 |
| Lithuania | 11 | 19 | Qatar | 1 | 1 | Morocco | 4 | 3 |
| Serbia | 41 | 48 | Lebanon | 3 | 4 | Ethiopia | 3 | 5 |
| Bulgaria | 11 | 11 | Nepal | 3 | 1 | Malawi | 1 | 1 |
| Moldova | 18 | 12 | Pakistan | 7 | 4 | Botswana | 4 | 3 |
| Estonia | 6 | 9 | Afghanistan | 1 | 1 | Mozambique | 2 | 2 |
| Cyprus | 7 | 6 | Syria | 1 | NA | Lesotho | 2 | 2 |
| Luxembourg | 2 | 4 | Samoa | 1 | NA | Cameroon | 1 | 1 |
| Iceland | 2 | 4 | Polynesia | 1 | NA | Tunisia | 2 | 2 |
| Slovenia | 10 | 13 | Israel | 1 | NA | Libya | 2 | 3 |

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| Latvia | 5 | 5 | UAE | **2** | **5** | Somalia | **1** | **1** |
| Macedonia | 3 | 5 | **N. America** | **ROAR** | **DOAR** | **Australia** | **ROAR** | **DOAR** |
| Romania | 16 | 6 | United States | **895** | **920** | **Australia** | **84** | **89** |
| Albania | 1 | 1 | Canada | 97 | 100 | N.Zealand | 22 | 19 |
| Malta | 1 | 1 | Mexico | 52 | 51 | **C.America** | **ROAR** | **DOAR** |
| Bosnia Herza | 3 | 2 | Panama | 5 | 6 | EI Salvador | 13 | 9 |
| French Guayana | 2 | NA | Costa Rica | 9 | 10 | Costa Rica | 9 | 10 |
| Martinique | 2 | NA | **Caribbean** | **ROAR** | **DOAR** | Honduras | 1 | 5 |
| **Oceania** | **ROAR** | **DOAR** | **Cuba** | **14** | **14** | Nicaragua | 7 | 11 |
| Fiji | 2 | 2 | Dominican Rep. | 4 | 4 | | | |
| New Caledonia | 1 | 1 | Jamaica | 1 | 6 | | | |
| | | | Puerto Rico | 1 | 1 | | | |
| | | | Guadeloupe | 2 | 1 | | | |

Table 2 analysis displays the country wise availability of open repositories in all the continents listed in the table 1. Highest registered countries were from Open DOAR and ROAR from various continents. According to the continent wise, UK, Germany, France and Spain countries form European continent; followed by Japan, Turkey, India and Indonesia countries from Asian continent; Brazil, Columbia and Peru countries were from South American continent; South Africa and Kenya countries from African Continent; United States and Canada countries from North American Continent; Australia country from Australian continent; and remaining countries were having less number of repositories respectively.

The highest status for the number of OARs registered in both Open ROAR and DOAR database is held by United States of America with 895 repositories in ROAR and 920 repositories in DOAR from the continent of North America. The second rank falls to Japan from Asian continent with 242 repositories in ROAR and 681 repositories in DOAR. And third position to United Kingdom from Europe continent with 262 repositories in ROAR and 318 repositories in DOAR.



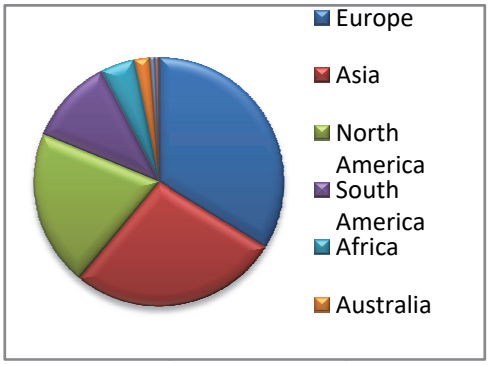




*Fig 1: Continental distribution of OARs in ROAR* *Fig 2: Continental distribution of OARs in DOAR*

These charts represent the values of continent based on, number of Open access repositories in each continent in ROAR and DOAR databases respectively.

## 2. Geographical distribution of OARs Using DSpace

Table 3 analysis reveals that the most usage content management software of DSpace software to a global extent by world countries in Open DOAR and Open ROAR. Its lists the number of institutional repositories that are registered in both ROAR and DOAR databases in various countries worldwide. The first and used in most elevated numbers to access 165(18.43%) DSpace software with 895 repositories in the united states of North America by ROAR and from DOAR 155(16.85%)DSpace software with 920 repositories in the united states of North America, at second levelled used from ROAR number to access 138 (85.71%) DSpace software with 161 repositories in the Peru from South American continentand DOAR 162(92.57%)DSpaceSW with 175 repositories in the Peru of South America. In the third position numbers to access 129(73.71%)Dspace software with 164 repositories in the Turkey of Asian continent and DOAR 112(65.15%)DSpace software with 172 repositories were in the Asian continent of Turkey. The fourth place contributed from ROAR in number to access 116 (62.36 %) DSpace software with 186 repositories in the Brazil of South America and DOAR 126 (82.35%)DSpaceSW with 153 repositories in the Brazil of South America. In fifth rank position number to access 111(55.22%) DSpace software with 201 repositories in the Spain of South America and DOAR 110 (61.80) DSpacesoftware with178 repositories in the Spain of South America.

**Table 3: Country wiseusage of Dspace**

| Europe | DSPACE | | Asia | DSPACE | | South America | DSPACE | |
|---|---|---|---|---|---|---|---|---|
| | ROAR | DOAR | | ROAR | DOAR | | ROAR | DOAR |
| UK | 51 | 45 | Japan | 101 | 56 | Brazil | 116 | 126 |
| Germany | 26 | 39 | Turkey | 129 | 112 | Columbia | 114 | 91 |
| Spain | 111 | 110 | India | 72 | 57 | Argentina | 35 | 40 |
| France | 10 | 11 | Taiwan | 75 | 58 | Peru | 138 | 162 |
| Italy | 38 | 74 | Indonesia | 20 | 14 | Ecuador | 28 | 34 |
| Poland | 19 | 27 | China | 87 | 37 | Chile | 13 | 15 |
| Ukraine | 98 | 95 | Korea | 51 | 28 | Venezuela | 9 | 9 |
| Norway | 52 | 62 | Malaysia | 5 | 5 | Bolivia | 0 | 2 |
| Portugal | 46 | 52 | Thailand | 12 | 16 | Uruguay | 4 | 7 |
| Sweden | 8 | 5 | Sri Lanka | 1 | 15 | **Africa** | **ROAR** | **DOAR** |
| Greece | 22 | 28 | Bangladesh | 7 | 13 | South Africa | 39 | 32 |
| Hungary | 11 | 10 | Iran | 3 | 2 | Kenya | 25 | 41 |
| Netherlands | 11 | 8 | SArabia | 5 | 7 | Nigeria | 13 | 27 |
| Russia | 28 | 33 | Philippines | 8 | 7 | Algeria | 10 | 16 |
| Belgium | 8 | 11 | Singapore | 3 | 4 | Tanzania | 6 | 12 |
| Belarus | 28 | 37 | Hong Kong | 4 | 2 | Zimbabwe | 9 | 8 |
| Ireland | 11 | 9 | Kazakhstan | 7 | 10 | Sudan | 11 | 12 |
| Croatia | 0 | 1 | Georgia | 1 | 2 | Egypt | 3 | 4 |
| Switzerland | 4 | 6 | Kyrgyzstan | 4 | 1 | Ghana | 6 | 6 |
| Czech Rep. | 12 | 17 | Azerbaijan | 4 | 2 | Uganda | 7 | 11 |
| Austria | 1 | 2 | Iraq | 0 | 0 | Senegal | 1 | 3 |
| Finland | 11 | 17 | Armenia | 0 | 0 | Rwanda | 1 | 2 |
| Denmark | 2 | 2 | Palestinian | 6 | 8 | Namibia | 2 | 2 |
| Lithuania | 8 | 6 | Qatar | 1 | 1 | Morocco | 4 | 3 |
| Serbia | 35 | 36 | Lebanon | 2 | 2 | Ethiopia | 2 | 4 |
| Bulgaria | 7 | 8 | Nepal | 0 | 0 | Malawi | 1 | 1 |
| Moldova | 15 | 10 | Pakistan | 2 | 1 | Botswana | 3 | 3 |
| Estonia | 2 | 4 | Afghanistan | 0 | 0 | Mozambique | 2 | 2 |
| Cyprus | 5 | 6 | Syria | 0 | NA | Lesotho | 1 | 2 |
| Luxembourg | 1 | 1 | Samoa | 1 | NA | Cameroon | 0 | 0 |
| Iceland | 1 | 2 | Polynesia | 0 | NA | Tunisia | 1 | 0 |

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| Slovenia | 1 | 1 | Israel | 0 | NA | Libya | 2 | 3 |
| Latvia | 3 | 3 | UAE | **1** | 4 | Somalia | **0** | **0** |
| Macedonia | 0 | 2 | **N. America** | **ROAR** | **DOAR** | **Australia** | **ROAR** | **DOAR** |
| Romania | 10 | 6 | UStates | 165 | 155 | Australia | 14 | 18 |
| Albania | 1 | 1 | Canada | 39 | 33 | New Zealand | 13 | 11 |
| Malta | **1** | 1 | Mexico | 25 | 32 | **Central America** | **ROAR** | **DOAR** |
| Bosnia Her | 0 | 0 | Panama | 3 | 6 | EI Salvador | 8 | 7 |
| French Guayana | 0 | NA | Costa Rica | 8 | 8 | Costa Rica | 8 | 8 |
| Martinique | 0 | NA | **Caribbean** | **ROAR** | **DOAR** | Honduras | 1 | 5 |
| **Oceania** | **ROAR** | **DOAR** | Cuba | 9 | 8 | Nicaragua | 1 | 3 |
| Fiji | 0 | 0 | Dominican Rep. | 4 | 3 | | | |
| New Caledonia | 0 | 0 | Jamaica | 3 | 3 | | | |
| | | | Puerto Rico | 1 | 1 | | | |
| | | | Guadeloupe | 0 | 0 | | | |

It could be found from this above table analysis, highest used DSpace SW for content management at open registry country in Open ROAR is United states and Peru in Open DOAR.

**Table 4: Highest Used countries DSpace SW for their Institutional Repositories**

| S. No | Continent | Country | OARs | | DSpace | | DSpace | |
|---|---|---|---|---|---|---|---|---|
| | | | ROAR | DOAR | ROAR | DOAR | % in ROAR | % in DOAR |
| 1 | North America | US | 895 | 920 | 165 | 155 | 18.43 | 16.85 |
| 2 | South America | Peru | 161 | 175 | 138 | 162 | 85.71 | 92.57 |
| 3 | Asia | Turkey | 164 | 172 | 129 | 112 | 73.71 | 65.15 |
| 4 | South America | Brazil | 186 | 153 | 116 | 126 | 62.36 | 82.35 |
| 5 | South America | Spain | 201 | 178 | 111 | 110 | 55.22 | 61.80 |

Table 4 reveals that the most used DSpace software for their institutional repositories. Based on this analysis, United States country has registered institutions are 165 (18.43%) 895 in ROAR and 155 (16.85%) 920 in DOAR from North America followed by 138 (85.71%) 161 in ROAR and 162 (92.57%) 175 in DOAR Peru from South America, 129 (73.71%) 164 in ROAR and 112 (65.15%) 172 in DOAR Turkey from Asia,Brazil country has registered used DSpace institutions 116 (62.36%) 186 in ROAR and 126 (82.35%) 153 in DOAR from South America, and Spain country has registered used DSpace institutions 111 (55.22%) 201 in ROAR and 110 (61.80%) 178 in DOAR from South America respectively. It could be noted the highest DSpace usage countries are US, Peru, Turkey, Brazil and Spain in Open DOAR and ROAR also the American and Asian Continents respectively.

# CONCLUSION

Concludes from this comparativestudy of most used DSpace software between ROAR and DOAR databasesstudy the results are, majority of countries were registered in DOAR compared to ROAR. The European continent, Asian continent and North American continent were registered highest institutions in open access repositories. UK and Germany countries form European continent; Japan and Turkey countries from Asian continent; Brazil and Columbia countries were from South American continent; South Africa and Kenya countries from African Continent; United States and Canada countries from North American Continent; Australia country from Australian continent; and remaining countries were having less number of repositories. DSpace used repositories in ROAR and DOAR by continent wise results are; Spain from European continent, Japan and Turkey countries were from Asian continent, Brazil and Colombia from South America continent; United States country from North American continent and remaining continent countries were used less number of repositories respectively. Out of 124top 5 (US, Peru, Turkey, Brazil and Spain) countries were majority usedDSpace software in ROAR and DOAR.

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# Scholarly Communication Pattern Through Open Access Repositories Of Roar : A Quantitative Study

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## Abstract

*This articleaims to identify the content management tools and techniques are usedfor scholarly communication of the institutional open access repositories from various countries and continents indexed by the ROAR (Registry of Open Access Repositories)database(http://www.roar.org). The study also looks atstatus of various aspects in open repositories and tries to present their overall developmentby worldwide. To provide a detailed description of repositories (totally 5144 institutions) in terms of, continent and countries,year wise growth, institutionalcontrinution, most used Content Management Software, and types of institutional repository items distribution.*

***Keywords**: Open Access, ROAR, database, open sources,Institutional Repositories,Content management software, repository types*

## INTRODUCTION: What is Institutional Repositories?

Lynch (2003, http://www.arl.org/bm~doc/br226ir.pdf) defines an Institutional Repository is a "set of services that a university offers to the members of its community for the management and dissemination of digital materials created by the institution and its community members. It is most essentially an organizational commitment to the stewardship of these digital materials, including long term preservation where appropriate, as well as organization and access or distribution". Peter Suber defined an "OA literature is digital, online, free of charge, and free of most copyright and licensing restrictions."(2004, revised 2010;http://www.earlham.edu/~peters/fos/overview.htm).

Current technological world, all higher educational institutions and colleges were have initiated the projects to develop open repositories that will facilitateto

easily access faculty and researchers to upload and download of scholarly communication and enable use them to share information knowledge with each other either within the institution or across the region, or more widely still.Such kind of some academic open repository types are: (a) ASU Digital Repository (Arizona State University), (b) Caltech AUTHORS (Caltec), (c) The Carolina Digital Repository (University of North Carolina), (d) Credo (University of Massachusetts), (e) DASH (Harvard University), (f) Deep Blue (University of Michigan), (g) Digital Scholarship@UNLV, (h) DukeSpace (Duke University), (i) eScholarship (University of California), (j) IDEALS (University of Illinois at Urbana-Champaign), (k) IUScholarWorks Repository (Indiana University), (l) Purdue University Research Repository/PURR (Purdue University), (m) *Scholarly* Commons (University of Pennsylvania), (n) MINDS@UW (University of Wisconsin), (o) The UNL DigitalCommons (University of Nebraska-Lincoln), (p) **ROAR (Registry of Open Access Repositories)** and (q) OpenDOAR (Directory of Open Access Repositories). Here the researcher has taken ROAR open repository for this study purpose.

## OBJECTIVES

This study also tries to attempt the understanding of distribution and status of OARs in ROAR database which has become a popular mode of information dissemination in various aspects with the following objectives.

- To observeGeographical (continent wise) distribution repositories of OARs
- To identify the most used Content Management Software for IRs in ROAR
- To identified the most used Repository types for IRs
- To reveal the growth pattern of repository content and the institutions contribution.
- Metadata format / schema used for retrieval of data from ROAR

## METHODOLOGY

ROAR database indexed the lists of various institutions' Open Access repositories from all over world. The necessary data wascollected from the source directory for tracing the development of OARs status in different viewpoint. A totally5144repositories were identifying from the openROAR as on 15thFeb' 2022. All the repositories were identified thoroughly shifted to MS Excel sheet and analysed for the necessary information as per the framed objective of this study.

## FINDINGS AND DISCUSSIONS

### *1. Geographical Distribution of Repositories*

Derived from the (table 1) that analysis, all continents are maintaining the OARs, totally125 countries were registered their institutional repositories in ROAR database. It is identifiedfrom this analysis that the major contribute countries are from European Continent which contributed1989 (38.67 %) of repositories with 42 countries, itis stood in first rank position among other continentsfollowed by Asiancontinent has 1128 (21.93%) of repositoriesregistered in ROAR with only 33 countries it stood in second rank position among other continents.North America appears as the third largest contributor 1057 (20.55%) of repositories with 5 countries.South American continent maintains609 (11.84%) of repositorieswith 9 countries,African continent repositories 201 (3.91%) with 23 countries, Australian continent repositories106 (2.06%) with only 2 countries, Central America has 26 (0.51 %) with 4 countries, Caribbean has 25 (0.49 %) with 5 countries and Oceania has 3 repositories (0.06 %) with only 2 countries respectively. It could be noted that the European continent created the open access repositories are highest than other continents' in open ROAR.

**Table 1: Continent wise Distribution of Open Repositories in ROAR database (5144)**

| Continent | No. of countries | No. of Institutions | % |
|---|---|---|---|
| Europe | 42 | 1989 | 38.67 |
| Asia | 33 | 1128 | 21.93 |
| North America | 5 | 1057 | 20.55 |
| South America | 9 | 609 | 11.84 |
| Africa | 23 | 201 | 3.91 |
| Australia | 2 | 106 | 2.06 |
| Central America | 4 | 26 | 0.51 |
| Caribbean | 5 | 25 | 0.49 |
| Oceania | 2 | 3 | 0.06 |
| **Total** | **125** | **5144** | **100** |

Table 2 analysisshows that the country wise open repository status from continent wise in ROAR. The highest repository created countries are UK, Germany and Spain from European continent. Followed by Japan, Indonesia, Turkey and India werefrom Asian continent; United States from North American; Brazil, Peru and Colombia were from South American; South Africa from African; Australia from Australian; EI Salvador from Central American; Cuba from Caribbean and Fiji from Oceania respectively.

It could be identified the overall highest repository countries are United States, UK, Germany and Japanamong 125 total countries respectively.

**Table 2: Geographical (country wise) Distribution of Open Repositories in ROAR database (5144)**

| S. No | Europe (1989) 38.67 % | % of 1989 | % of 5144 | S. No | North America (1057) 20.55 % | % of 1057 | % of 5144 | S. No | South America (609) 11.84 % | % of 609 | % of 5144 |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | UK (262) | 13.17 | 5.09 | 1 | United States (896) | 84.77 | 17.42 | 1 | Brazil (186) | 30.54 | 3.62 |
| 2 | Germany (261) | 13.12 | 5.07 | 2 | Canada (97) | 9.18 | 1.89 | 2 | Peru (160) | 26.27 | 3.11 |
| 3 | Spain (201) | 10.11 | 3.91 | 3 | Mexico (52) | 4.92 | 1.01 | 3 | Columbia (127) | 20.85 | 2.47 |
| 4 | Poland (128) | 6.44 | 2.49 | 4 | Costa Rica (7) | 0.66 | 0.14 | 4 | Argentina (64) | 10.51 | 1.24 |
| 5 | Ukraine (118) | 5.93 | 2.29 | 5 | Panama (5) | 0.47 | 0.10 | 5 | Ecuador (31) | 5.09 | 0.60 |
| 6 | France (102) | 5.13 | 1.98 | | Asia (1128) 21.93 % | % of 1128 | % of 5144 | 6 | Chile (27) | 4.43 | 0.52 |
| 7 | Italy (98) | 4.93 | 1.91 | 1 | Japan (242) | 21.45 | 4.70 | 7 | Uruguay (7) | 1.15 | 0.14 |
| 8 | Sweden (76) | 3.82 | 1.48 | 2 | Indonesia (175) | 15.51 | 3.40 | 8 | Venezuela (4) | 0.66 | 0.08 |
| 9 | Russia (67) | 3.37 | 1.30 | 3 | Turkey (164) | 14.54 | 3.19 | 9 | Bolivia (3) | 0.49 | 0.06 |
| 10 | Portugal (62) | 3.12 | 1.21 | 4 | India (131) | 11.61 | 2.55 | | | | |
| 11 | Portugal (60) | 3.02 | 1.17 | 5 | China (96) | 8.51 | 1.87 | | Africa (201)4.25% | % of 201 | % of 5144 |
| 12 | Norway (59) | 2.97 | 1.15 | 6 | Taiwan (83) | 7.36 | 1.61 | 1 | South Africa (52) | 25.87 | 1.01 |
| 13 | Hungary (46) | 2.31 | 0.89 | 7 | Korea (54) | 4.79 | 1.05 | 2 | Kenya (30) | 14.93 | 0.58 |

| | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 14 | Netherlands (46) | 2.31 | 0.89 | 8 | Malaysia (42) | 3.72 | 0.82 | 3 | Nigeria (17) | 8.46 | 0.33 |
| 15 | Greece (41) | 2.06 | 0.80 | 9 | Iran (16) | 1.42 | 0.31 | 4 | Algeria (15) | 7.46 | 0.29 |
| 16 | Serbia (41) | 2.06 | 0.80 | 10 | Thailand (15) | 1.33 | 0.29 | 5 | Sudan (13) | 6.47 | 0.25 |
| 17 | Belgium (37) | 1.86 | 0.72 | 11 | Philippines (15) | 1.33 | 0.29 | 6 | Zimbabwe (12) | 5.97 | 0.23 |
| 18 | Belarus (34) | 1.71 | 0.66 | 12 | Bangladesh (11) | 0.98 | 0.21 | 7 | Egypt (12) | 5.97 | 0.23 |
| 19 | Switzerland(30) | 1.51 | 0.58 | 13 | Saudi Arabia (10) | 0.89 | 0.19 | 8 | Tanzania (9) | 4.48 | 0.17 |
| 20 | Ireland (27) | 1.36 | 0.52 | 14 | Hong Kong (10) | 0.89 | 0.19 | 9 | Uganda (8) | 3.98 | 0.16 |
| 21 | Austria (27) | 1.36 | 0.52 | 15 | Kazakhstan (10) | 0.89 | 0.19 | 10 | Ghana (6) | 2.99 | 0.12 |
| 22 | Finland (23) | 1.16 | 0.45 | 16 | Singapore (7) | 0.62 | 0.14 | 11 | Morocco (4) | 1.99 | 0.08 |
| 23 | Moldova (18) | 0.90 | 0.35 | 17 | Palestinian (7) | 0.62 | 0.14 | 12 | Botswana (4) | 1.99 | 0.08 |
| 24 | Denmark (17) | 0.85 | 0.33 | 18 | Pakistan (7) | 0.62 | 0.14 | 13 | Ethiopia (3) | 1.49 | 0.06 |
| 25 | Czech Rep. (16) | 0.80 | 0.31 | 19 | Kyrgyzstan (5) | 0.44 | 0.10 | 14 | Senegal (2) | 1.00 | 0.04 |
| 26 | Romania (16) | 0.80 | 0.31 | 20 | Azerbaijan (5) | 0.44 | 0.10 | 15 | Namibia (2) | 1.00 | 0.04 |
| 27 | Lithuania (11) | 0.55 | 0.21 | 21 | Iraq (3) | 0.27 | 0.06 | 16 | Mozambique (2) | 1.00 | 0.04 |
| 28 | Bulgaria (11) | 0.55 | 0.21 | 22 | Lebanon (3) | 0.27 | 0.06 | 17 | Lesotho (2) | 1.00 | 0.04 |
| 29 | Slovenia (10) | 0.50 | 0.19 | 23 | Nepal (3) | 0.27 | 0.06 | 18 | Tunisia (2) | 1.00 | 0.04 |
| 30 | Croatia (7) | 0.35 | 0.14 | 24 | Sri Lanka (2) | 0.18 | 0.04 | 19 | Libya (2) | 1.00 | 0.04 |
| 31 | Cyprus (7) | 0.35 | 0.14 | 25 | Georgia (2) | 0.18 | 0.04 | 20 | Rwanda (1) | 0.50 | 0.02 |
| 32 | Estonia (6) | 0.30 | 0.12 | 26 | Armenia (2) | 0.18 | 0.04 | 21 | Malawi (1) | 0.50 | 0.02 |
| 33 | Latvia (5) | 0.25 | 0.10 | 27 | UAE(2) | 0.18 | 0.04 | 22 | Cameroon (1) | 0.50 | 0.02 |
| 34 | Macedonia (3) | 0.15 | 0.06 | 28 | Qatar (1) | 0.09 | 0.02 | 23 | Somalia (1) | 0.50 | 0.02 |
| 35 | Bosnia Herzegovina (3) | 0.15 | 0.06 | 29 | Afghanistan (1) | 0.09 | 0.02 | | | | |
| 36 | French Guayana (3) | 0.15 | 0.06 | 30 | Syria (1) | 0.09 | 0.02 | | **Australia (106)** 2.06% | **% of 106** | **% of 5144** |

| | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 37 | Luxembourg (2) | 0.10 | 0.04 | 31 | Samoa (1) | 0.09 | 0.02 | 1 | Australia (84) | 79.25 | 1.63 |
| 38 | Iceland (2) | 0.10 | 0.04 | 32 | Polynesia (1) | 0.09 | 0.02 | 2 | New Zealand (22) | 20.75 | 0.43 |
| 39 | Martinique (2) | 0.10 | 0.04 | 33 | Israel (1) | 0.09 | 0.02 | | | | |
| 40 | Slovak (2) | 0.10 | 0.04 | | **Caribbean (25)0.49%** | **% of 25** | **% of 5144** | | **Central America (26)0.58%** | **% of 26** | **% of 5144** |
| 41 | Albania (1) | 0.05 | 0.02 | 1 | Cuba (14) | 56 | 0.27 | 1 | EI Salvador (13) | 43.33 | 0.25 |
| 42 | Malta (1) | 0.05 | 0.02 | 2 | Dominican Rep. (4) | 16 | 0.08 | 2 | Costa Rica (9) | 30 | 0.17 |
| | **Oceania (3) 0.06%** | **% of 3** | **5144** | 3 | Jamaica (4) | 16 | 0.08 | 3 | Nicaragua (7) | 23.33 | 0.14 |
| 1 | Fiji (2) | 66.67 | 0.04 | 4 | Guadeloupe (2) | 8 | 0.04 | 4 | Honduras (1) | 3.33 | 0.02 |
| 2 | New Caledonia (1) | 33.33 | 0.02 | 5 | Puerto Rico (1) | 4 | 0.02 | | | | |

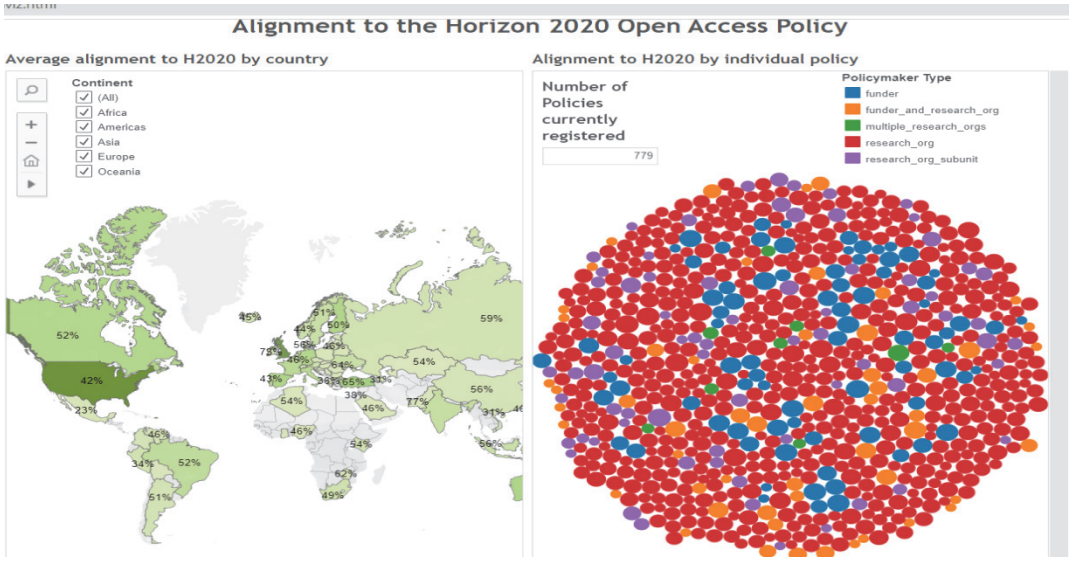



**Figure 1: Geographical Proportion of repositories by policies in ROAR**

This chart indicated the values of based on the number ofopen repositories in each continent and its countriesby the number of policies from each continent.

## 2 Most UsedContent Management Software

There areavailable muchcontent management software for creating open access repositorieswith range of features and capabilities. ROAR indexed institutions were used the different kind of software for their open repositories.Table 3 reveals that the most used content management software (31 types, including other software apart from this list) are creating their institutional open repositories in ROAR for digital preservation.

Out of 5144institutions'most used software are;2416 (46.97%) institutions were used the DSpaceSW followed by 836 (16.15 %) of institutions were used EPrints, 648 (12.77 %) institutions were used other types of SW, 526 (10.26%) institutions were used Bepress, 134(2.45%) institutions were used OPUS software and remaining 26 types of software were used by below100 institutions respectively.

**Table3: Most used Content Management Software for Repositories in ROAR**

| | **Europe** | **Asia** | **NA** | **SA** | **Africa** | **Australia** | **CA** | **Caribn.** | **Ocea.** | **Total** |
|---|---|---|---|---|---|---|---|---|---|---|
| **DSpace** | 803 | 626 | 378 | 396 | 141 | 37 | 18 | 15 | 2 | **2416(46.97)** |
| Eprints | 421 | 147 | 109 | 81 | 46 | 16 | 7 | 8 | 1 | **836(16.15)** |
| Other SW | 96 | 124 | **380** | 28 | 4 | 16 | 0 | 0 | 0 | **648(12.77)** |
| Bepress | 221 | 124 | 93 | 70 | 5 | 10 | 1 | 2 | 0 | **526(10.26)** |
| OPUS (Open publn. Sys) | 99 | 21 | 14 | 0 | 0 | 0 | 0 | 0 | 0 | **134(2.45)** |
| Fedora | 51 | 10 | 13 | 0 | 1 | 16 | 0 | 0 | 0 | **91(1.77)** |
| Open jrl. system | 37 | 18 | 9 | 11 | 0 | 0 | 0 | 0 | 0 | **75(1.46)** |

| | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| ETD db | 23 | 19 | **13** | 2 | 2 | 1 | 0 | 0 | 0 | **60(1.17)** |
| CDS Invenio | 51 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | **51(0.99)** |
| DIVA | 42 | 0 | 3 | 0 | 1 | 0 | 0 | 0 | 0 | **46(0.89)** |
| HAL | 37 | 0 | 3 | 0 | 0 | 0 | 0 | 0 | 0 | **40(0.78)** |
| Green Stone | 14 | **14** | 1 | 6 | 0 | 0 | 0 | 0 | 0 | **35(0.68)** |
| Digibib | 32 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | **32(0.62)** |
| Open Repos. | 19 | 5 | 0 | 3 | 0 | 0 | 0 | 0 | 0 | **27(0.52)** |
| MiTOS | 6 | **18** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | **24(0.47)** |
| OCLC | 7 | 0 | **11** | 4 | 0 | 0 | 0 | 0 | 0 | **22(0.43)** |
| MyCoRe | 1 | 2 | 9 | 0 | 0 | **7** | 0 | 0 | 0 | **19(0.39)** |
| Fedora Fez | 2 | 0 | 7 | 7 | 0 | 0 | 0 | 0 | 0 | **16(0.23)** |
| DigiTool | 1 | 0 | 9 | 0 | 1 | 1 | 0 | 0 | 0 | **12(0.16)** |
| Equalla | 3 | 0 | 3 | 0 | 0 | 2 | 0 | 0 | 0 | **8(0.12)** |
| DOKS | 6 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | **6(0.10)** |
| PMB service | 4 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | **4(0.08)** |
| ARNO | 2 | 0 | 1 | 1 | 0 | 0 | 0 | 0 | 0 | **4(0.08)** |
| SBCAT | 3 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | **3(0.06)** |
| SciX | 3 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | **3(0.06)** |
| Keystone DLS | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | **1(0.02)** |
| EDOC | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | **1(0.02)** |
| SobekCM | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | **1(0.02)** |

| | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| WIKINX | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | **1(0.02)** |
| Zentity | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | **1(0.02)** |
| i-Tor | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | **1(0.02)** |
| **Total** | **1989** | **1128** | **1057** | **609** | **201** | **106** | **26** | **25** | **3** | **5144** |

According to continent wise used CMS are the following; European countries were most used CMS is DSpace, EPrints, Bepress and remaining SW used by below 100 institutions; followed by, Asian countries were most used CMS is DSpace, Bepress, OPUS and remaining SW used by below 96 institutions; also found the all continent institutions were most used CMS is DSpace, EPrints and Bepress respectively.

It could be identify the most used software were **DSPace, E Prints and Bepress**. The European countries used many types of software used for their content creation of different organizations.

**3 Types of RepositorySources**

The researcher has categorized continent by their types of repository resources in Open ROAR, it is most benefit of researchers, end users and professionals according to individual respective institutions.There are twelve types (including other types of repository) of repositories available in open access repositories in ROAR alsotable4analysis reveals that the preference of their repositorytypes.

Out of 12 types of repositories by selective countries; such that3030 (58.9%) are Research institutional of Departmental;708 (13.76%) of E-Thesis;543 (10.56%) of Research Cross institutions;268 (5.21%) of E- Journals / Publications, 119 (2.31 %) of Research multi institution repository, 72 (1.4%) of Database / A & I Index;75 (1.46%) of Learning and Teaching Objects;49 (0.95%) of Research Data; 51(0.99%) of Open & Linked data;18 (0.35 %) of Demonstrations; only two (0.04 %) of Web observatory and 209 (8.9%) of institutions were used other types of sources too for their institutional repositories. It was observed that maximum number of IRs were institutional based.

**Table 4: Continent wise distribution of Repository Types in ROAR**

| Types of Repositories | Europe | Asia | NA | SA | Afri. | Aust. | CA | Caribn. | Ocea. | Total |
|---|---|---|---|---|---|---|---|---|---|---|
| Res. Institnal. or Departmental | 983 | 736 | 584 | 469 | 171 | 52 | 18 | 15 | 2 | **3030 (58.9)** |
| E - Theses | 331 | 147 | 109 | 71 | 18 | 16 | 7 | 8 | 1 | **708 (13.76)** |
| Research Cross institutions | 116 | 109 | 270 | 28 | 4 | 16 | 0 | 0 | 0 | **543 (10.56)** |
| E journals / publications | 123 | 62 | 43 | 28 | 4 | 5 | 1 | 2 | 0 | **268 (5.21)** |
| Res. multi institution Repository | 89 | 22 | 8 | 0 | 0 | 0 | 0 | 0 | 0 | **119 (2.31)** |
| Database / A & I Index | 42 | 6 | 7 | 0 | 1 | 16 | 0 | 0 | 0 | **72 (1.4)** |
| Learning & Teaching objectives | 37 | 18 | 9 | 11 | 0 | 0 | 0 | 0 | 0 | **75 (1.46)** |
| Research Data | 23 | 11 | 10 | 2 | 2 | 1 | 0 | 0 | 0 | **49 (0.95)** |
| Open & Linked data | 51 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | **51 (0.99)** |
| Demonstration | 16 | 0 | 1 | 0 | 1 | 0 | 0 | 0 | 0 | **18 (0.35)** |
| Web observatory | 0 | 0 | 2 | 0 | 0 | 0 | 0 | 0 | 0 | **2 (0.04)** |
| Others | 178 | 17 | 14 | 0 | 0 | 0 | 0 | 0 | 0 | **209 (4.06)** |
| **Total** | **1989** | **1128** | **1057** | **609** | **201** | **106** | **26** | **25** | **3** | **5144** |

Out of 12 repository types in ROAR most used types of repository sources by continent wise results are:according to the most type of Research Institutional or

Departmental; 983institutions from European; 736 institutions from Asia;584 countries from North American; 469 institutions from South American; 171 from African countries; 52 institutions from Australia; 18 institutions from Central America; 15 countries from Caribbean 2 countries from Oceania respectively.According to the most used type of E-Thesis; 331institutions from Europe; 147 institutions from Asia;109 countries from North American; 71 institutions from South American; 18 from African countries; 16 institutions from Australia; 7 institutions from Central America; 8 countries from Caribbean 1 country from Oceania respectively. According to the most used type of Research Cross institutions; 116institutions from Europe; 109 institutions from Asia;270 countries from North American; 28 institutions from South American; 4 from African countries; 16 institutions from Australia; no countries from Central America, Caribbean and Oceania respectively.

And Remaining Repository types were used less number of institutions by continents. It could be noted that all continent organizations were given preference institutional repositories only.

**4.7Year wise Growth of ROARin world**

Table 5 reveals that theopen repositories in ROAR were growth by the year result is followings in the parenthesis bracket numbers has mentioned the number of institutions;1991(2), 1993 (4), 1994 (1), 1995 (9), 1996 (3),1997 (6), 1998 (9), 1999 (13), 2000 (17), 2001 (27),2002 (52), 2003 (86), 2004 (133), 2005 (196), 2006 (334), 2007 (189), 2008 (270), 2009 (320), **2010 (464),** 2011 (308),**2012 (615),** 2013 (227), 2014 (371), 2015 (214), 2016 (244), 2017 (222), 2018 (134), 2019 (308), 2020 (217), 2021 (134) and 2022 (15) respectively.

**Table 5: Year wise growth rate of openRepository Types in ROAR**

| S.No | Year | No. of Ins. | % | S.No | Year | No. of Ins. | % |
|---|---|---|---|---|---|---|---|
| 1 | 1991 | 2 | 0.04 | 17 | 2007 | 189 | 3.67 |
| 2 | 1992 | 0 | 0.00 | 18 | 2008 | 270 | 5.25 |
| 3 | 1993 | 4 | 0.08 | 19 | 2009 | 320 | 6.22 |
| 4 | 1994 | 1 | 0.02 | 20 | 2010 | 464 | 9.02 |
| 5 | 1995 | 9 | 0.17 | 21 | 2011 | 308 | 5.99 |
| 6 | 1996 | 3 | 0.06 | 22 | 2012 | 615 | **11.96** |
| 7 | 1997 | 6 | 0.12 | 23 | 2013 | 227 | 4.41 |

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| 8 | 1998 | 9 | 0.17 | 24 | 2014 | 371 | 7.21 |
| 9 | 1999 | 13 | 0.25 | 25 | 2015 | 214 | 4.16 |
| 10 | 2000 | 17 | 0.33 | 26 | 2016 | 244 | 4.74 |
| 11 | 2001 | 27 | 0.52 | 27 | 2017 | 222 | 4.32 |
| 12 | 2002 | 52 | 1.01 | 28 | 2018 | 134 | 2.60 |
| 13 | 2003 | 86 | 1.67 | 29 | 2019 | 308 | 5.99 |
| 14 | 2004 | 133 | 2.59 | 30 | 2020 | 217 | 4.22 |
| 15 | 2005 | 196 | 3.81 | 31 | 2021 | 134 | 2.60 |
| 16 | 2006 | 334 | 6.49 | 32 | 2022 | 15 | 0.29 |
| | **Total** | | | | | **5144** | **100** |

Between the years of 1991 to 1998 single numbers of institutions were created the open repositories; followed by 1999 to 2003 were double digit number of institutions were started to create the open repositories. Since 2004 started three digits number of institutions were started among those the year 2012 was created highest number of institutions followed by the 2010 respectively. 2022 yeardata is not completed; hence when the researcher collected the data is shown less number of institutions from ROAR. It could be noted that increased by world institutions after 14 years starting to created open repository in ROAR.

## CONCLUSION

Used by the current technology all higher educational institutions were used to preserved information in the way of institutional repositories andwell executedfor theknowledge sharing to the end users bylibrary professionals/any other information managertoprovidethe necessary information.Based on this study the following results were concluded the European continent created highest number institutional repositories in ROAR. USA, UK, Germany and Japan were created more number of repositories in ROAR among 126 countries. Majority oforganizations were created their digital repositories and maintained the preservation digital documents usedbyDSpace, EPrints and BeperessContent Management software. The type of Repository sources are"Research Institutional or Departmental"is most used by worldwide. It is observed that a healthy trend prevailed in terms of open access content initiatives as India placed in fourth position. This study might be used for making aware among the library professionals to further contribute and to build a digital repository to sharing the

knowledge to the end user through web at global level. India is being the second largest education system in the world needs more such initiatives to preserve the knowledge outcome following international protocols for long term and enhance the visibility of Indian research and knowledge outcome.

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# Modern Library and Information Sources

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## Abstract

*The Internet has become a big library for all kinds of information. Some information sources are available online free of charge while others are subscription-based. This paper focous on free of charge /Open aswell subscription-based e- books, e-databases,e- journals and e-reference resources MEDLINE/PubMed is a good example of a free online database while EMBASE is based on subscription.The following are the various categories of information sources that could be accessed through the Web such as Reference, Monographs,Periodicals,Indexes and abstracts, Drug information and Databases*

## Introduction

Information can come virtually anywhere from social media, blogs, personal experiences, books, journal and magazine articles, expert opinions, encyclopedias, and web pages and the type of information you need will change depending on the question you are trying to answer. Different assignments require information from a variety of sources; therefore, you need to understand where to go to find certain types of information.After reviewing the material in this section, students will be able to:

- Differentiate different types of information sources.
- Select a type of source needed for a specific information need based on appropriateness.
- Explain the difference between a scholarly and popular article.

## Three Types ofResources:-

In general, there are three types of resources or sources of information: primary, secondary, and tertiary. It is important to understand these types and to know what type is appropriate for your coursework prior to searching for information.

1. **Primary sources:-**

   Primary sources original materials on which other research is based, including:
   - Original written works – poems, diaries, court records, interviews, surveys, and original research/fieldwork, and
   - Research published in scholarly/academic journals.
2. **Secondary sources:-**
   Secondary sources are those that describe or analyze primary sources, including:
   - Reference materials – dictionaries, encyclopedias, textbooks, and
   - Books and articles that interpret review or sythesize original research/fieldwork.
3. **Tertiary sources:-**
   Tertiary sources are those used to organize and locate secondary and primary sources.
   - Indexes – provide citations that fully identify a work with information such as author, titles of a book, artile, and/or journal, publisher and publication date, volume and issue number and page numbers.
   - Abstracts – summarize the primary or secondary sources,
   - Databases – are online indexes that usually include abstracts for each primary or secondary resource, and may include a digital copy of the resource.

## Types of Information Sources

Information sources are often classified as physical (print, analog) versus online (electronic, digital), text versus audio-video and book versus journal.Here are some common information source types with descriptions of how is their information usually is, what kind of information is contained in them, and where to find them.

## Journal Articles

- Currency: Current within a few months to a few years of publication. Look at the list of references used. What is the most recent date you can find? That should tell you when they stopped researching and started writing. But bear in mind that experimental/observational data they gathered may be a year or two older than that.

- Type of Information: Most recent research within the subject of the journal. Scholarly journal articles are important in all academic subject areas, but especially in the sciences, where most researchers do not write books.
- Where to Find: Print journals are delivered to subscribers and libraries. Some journals are Open Access and make all their content online for free. Some journals allow authors to keep a copy of their articles online in a repository and you can usually find these through Google Scholar. Libraries subscribe to article databases. Those subscriptions make millions of articles available to users at those institutions.

**Magazine Articles**

- **Currency:**

  News magazine articles should be current within a few days to a few months of publication. But many magazine articles are based on scholarly articles, so their information is not as new.

- **Type of Information:**

  Current events and editorials (news magazine). Non-scholarly articles about topics of interest within the subject of the magazine.

- **Where to Find**:

  Print magazines are delivered to homes and libraries. Some magazines have an online presence, but access to older articles may require a subscription. Some library databases have full-text articles from magazines.

**Newspaper Articles**

- **Currency:**

  Current within a few minutes to a day of publication. Corrections made after the fact can change content later.

- **Type of Information**: Current events and editorials.
- **Where to Find:**

  Print newspapers are delivered to homes and libraries. Many newspapers have an online presence but access to older articles may require a subscription. Libraries can subscribe to newspaper databases.

**Monographs (a.k.a. Scholarly Books)**

- Currency:

  Information may be two or three years old. Just like with journals, look for the most recent date in the bibliography, and that should tell you around when the author(s) were researching and writing. Bear in mind that

experimental/observational data the author(s) gathered may be a year or two older than that.

- **Type of Information:**

  Scholarly research on a topic, Not as recent as a journal article, but may address a whole subject rather than just a piece of it. Monographs are very important in the humanities.

- **Where to Find:**

  Monographs are primarily available through academic libraries. Some are in print some are e-books. These e-books are not available to consumers, but are generally meant to be read via a web browser or downloaded as a PDF.

**Nonfiction Books**

- **Currency:**

  Varies widely Books on hot topics may be published within a few weeks but, as a result, they may contain errors. Other books take two or more years to get to print, and the research may be even older.

- **Type of Information:** Non-scholarly information and opinion.

- **Where to Find:**

  Nonfiction books are found in bookstores and mainly public libraries. e-book versions may be available for consumers via Kindle, Nook, iPad, etc. Nonfiction books on academically relevant topics that are of reasonably high quality are collected by academic libraries. Some of them may be available through academic libraries in formats that are read in web browsers or downloaded as PDF.

**Reference Sources:-**

These authoritative works provide specific answers or information. As you go through school, you will need to use reference sources to find information about topics, locate facts, and answer questions. There are many types of reference sources, including atlases, dictionaries, encyclopedias, thesauri, directories, almanacs, manuals, biographies, and handbooks, among others. Each type is available either in print, on CD-ROMs and the Internet. Reference information sources can be general or subject specific. For example, The Encyclopedia Britannica is general while The Encyclopedia of Stem-Cell Research, The Encyclopedia of Pain, and The Gale encyclopedia of Medicine are subject encyclopedias. Other reference sources such as dictionaries, atlases, directories also have both general and subject categories.

- **Currency:**

  Print reference resources often have annual updates, so the information in them should be only about a year old. Online reference resources may be update continuously. Many statistical resources have older data because it takes a long time to organize it all. Historical resources summarize and synthesize established knowledge, rather than keeping up with the newest findings. The important thing is that reference resources usually tell you how old their information is.

- **Type of Information:**

  Summary and synthesis of what is known about a topic. Materials to be referred to; for example, facts and figures, dates, names, measurements, statistics, quotations, instructions, equations, formulae, definitions, explanations, charts, graphs, diagrams, maps.

- **Where to Find:**

  Traditionally, reference resources are available as books or series of books. But are often too expensive for consumers to purchase them. They can found in the reference sections of public and academic libraries. Not all print reference sources are books; for example, there are also maps. More and more reference resources are available in online format, and as they go online, they become linear, taking advantage of the ability to link and include multimedia. Online reference resources are available through specialized library databases, and there are also many of them on the web. Some are free and some require an individual subscription.

**Textbooks**

- **Currency:**

  Varies widely. Some textbook editors publish a new edition every year, and their information should be current within a year or two of the edition's publication date. Other textbooks in less time-sensitive disciplines may contain information that is historical in nature.

- **Type of Information:-**

  Information on a topic arranged in such a way that a beginner can acquire knowledge about that topic systematically. Textbooks are meant to be used as part of taking a course, but are usually written so that they are complete and understandable on their own. Textbooks may have supplemental materials like questions to guide your reading or self-quizzes as well as accompanying multimedia material. Some e-textbooks come with fully integrated multimedia.

- **Where to Find:**

In libraries that have a physical location and physical collection, some textbooks may be in the stacks or held on reserve for short-term loan. Most textbook publishers do not make textbooks available as e-books for libraries. Instead, textbooks whether print or e-book, must be purchased by the individual student. Some textbooks may also rent for the duration of the course.

## Gray Literature

Gray literature is a huge category that encompasses a wide variety of documents that have not been published in the traditional sense. Gray literature includes:

- Unpublished conference papers
- Unpublished theses and dissertations
- Presentations
- Working papers
- Notes and logs kept by researchers
- Academic courseware, professors' teaching notes, students' lecture notes
- Company annual reports
- Project and study reports
- Institutional reports
- Technical reports
- Reports put out by government agencies
- Data and statistics
- Unpublished letters and manuscripts
- Patents, technical standards
- Newsletters, product catalogs, and certain other types of ephemera with a strong informational value
- Preprints of articles

Certain kinds of gray literature can found in databases. Others are best found by searching the web. Sometimes it is difficult to ascertain the author or organization responsible for the information, which can make gray literature, may be difficult to cite.

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# Digital Resources: e-Books & e-Journals

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**Abstract*:***
*The presentation reviews issues concerning the publication of electronic books and electronic journals. It details advantages and limitations of e-publishing, categories and types of e-books and e-journals. This chapter presents several methods of creating e-publications with advantages and disadvantages of each method. It gives the common understanding about how to choose the most suitable way to publish electronically and how to prepare electronic publication – e-book or e-journal – from the beginning to the end, offering useful practical advises. The presentation also reviews examples of already existing electronic books and journals, their libraries and collections.*

***Keywords:*** *electronic publishing, e-book, e-journal, HTML, PDF, Rocket E-book, the World Wide Web, Website, Webpage, URL, browser.*

## Introduction to Electronic publishing:

Electronic publication is arranged computer information. In electronic publishing, or e-publishing, material is produced and stored electronically rather than in print. Whenever users display, present or "post" any written, auditory or visual media on to the World Wide Web, it can be said they are "publishing" electronic content. Most traditional newspapers and magazines today publish in an electronic form on the Web where access is typically "free" or available through a free membership.
Frequently electronic publishing is referring to production of electronic books.
Then electronic publishing can mean:

a) Production and distribution of new works, which are appearing for the first time in electronic format.
b) Providing electronic text versions of previously published works (such as classic literature, non-copyrighted material, or works that have entered the public domain), either online or on CD-ROM, or offering an electronic version of a book that is simultaneouslybeing produced in print.
Electronic publications should have several important features:

- Convenient navigation;
- Information control;
- Search possibilities;
- Identification number (ISSN, ISBN, DOI, etc.) Electronic publications are being registered in ISSN and ISBN agencies already. They have to be registered independently from their "traditionally" published analogue.

## Electronic books

There are quite a lot of discussions about what exactly can be called the electronic book, but for this course let's define electronic book as any book, which can be downloaded and read on a computer or special reader. The publishing world is in a state of flux at the moment concerning the future of books, although there is an almost universal agreement that the future of books involves the electronic format in one way or another. Penguin
Books, for example, has given its backing to *Microsoft Reader* and is planning to supply 1000 classics of literature in this format.

E-books can be very various by their form: from textual-only editions to manifold media to cyber-books creating virtual reality. The first electronic publications were distributed on floppy disks, and now they are usually presented on CD-ROM's and the Internet. Many e-books are self-contained executable files of HTML, which are completely interactive with the Internet and can contain live links, graphics, search capabilities, JavaScript, embedded video, can be protected via password/user ID, and more. This HTML may be a Website or HTML specifically prepared to be compiled into a downloadable executable file for distribution. When downloaded, this file is self-installing on client's desktop. When a user double-clicks on this computer file, a browser-like interface opens up with the cover page for the e-book and then links to anindex page. Through e-book's index, it is possible to present the readers with a table of contents - or a list of topics - from which they can select the pages they want to read, with just a few mouse clicks.

### Categories of electronic book publishing

The electronic publishing industry can be divided into three basic categories: commercial, subsidy, and self-publishing:

### Commercial e-publishing

Commercial e-publishers function like commercial print publishers. Manuscripts are accepted on the basis of quality and marketability, and go through a process of review, editing, and proofreading before publication. Most commercial e-publishers accept fewer than 10% of submissions. Writers pay no fee for publication, and receive royalties. Commercially published e-books are sold primarily through the publisher's Website, but are also available on most online bookstores (including Amazon.com and Barnes and Noble). Distribution in traditional bookstores, however, is still limited. (However, as all e-books have ISBNs, they can be ordered through any bookstore.)

### . Subsidy e-publishing

Subsidy e-publishers produce and distribute books for a fee. Authors receive a royalty, which is usually comparable to that offered by commercial e-publishers. Unlike commercial e-publishers subsidy publishers provide little screening (except for offensive content such as pornography or hate material), and usually accept any manuscript, regardless of quality. Most subsidy publishers provide no editorial services or proofreading (though some offer such services for an extra fee); books are posted exactly as submitted. Subsidy publishers also offer few promotional services; the responsibility for promoting a book rests primarily with the author.

Like commercially published e-books, subsidy-published e-books are available through most online bookstores, but very rarely found in traditional bookstores. However, like commercially published e-books, they have ISBNs and can be ordered from any bookstore.

### Self-publishing

Self-publishing is a process in which the author is entirely responsible for producing his/her own book, from development to "publication" to marketing. Most often, a self-published e-book will be posted upon the author's own site. In self-publishing, the author formats the text (or arranges for formatting), and is responsible for obtaining the ISBN and copyright registration. The author is directly responsible for publishing expenses, and receives all revenues from book sales.

## E-books and their collections

You can find lots of electronic books on the Web, but for the beginning check these Websites:

**Projects of e-books:**

It is not so easy to find electronic books "scattered" all over the Internet. That is why there are certain projects of e-books, dedicated to completing the electronic publications:

- Project Gutenberg *(http://promo.net/pg)* - The Project Gutenberg philosophy is to make information, books and other materials available to the general public in forms a vast majority of the computers, programs and people can easily read, use, quote, and search. In this project you can find: light Literature, such as Alice in Wonderland, Through the Looking-Glass, Peter Pan, Aesop's Fables, etc.; heavy Literature, such as the Bible or other religious documents, Shakespeare, Moby Dick, Paradise Lost, etc.; references, such as Roget's Thesaurus, almanacs, and a set of encyclopaedia, dictionaries, etc.
- e-Lib programme *(http://www.ukoln.ac.uk/services/elib)* – The Electronic Libraries Programme is dedicated to accumulating electronic publications, searching the Internet for them and presenting electronic documents to the user.

**. Websites of e-books:**

There are lots of sites on the Web with collections of various electronic books. Several examples are:

- The On-Line Books Page *(http://digital.library.upenn.edu/books/)* – it is a directory of e-books that can be freely read right on the Internet. It includes an index of thousands of on-line books on the Internet, pointers to significant directories and archives of on-line texts, special exhibits and much more.
- Prize-Winning Books On-Line *(http://digital.library.upenn.edu/books/prize.html)* – in this exhibit you will find electronic copies of awarded books (works that won Nobel prizes, for example).
- Christian Classic *(http://www.ccel.org)* – Website of classic Christian books in electronic format.
- The Internet Public Library: Reading Room *(http://www.ipl.org/reading)* - This room contains bookshelves for browsing and searching for entertaining reading, and links to sites providing other full texts.
- Barnes&Noble.com E-Book store *(http://ebooks.barnesandnoble.com)* - if you want to know more about e-books, or start shopping, this is the place to be.
- eBookNet*(http://www.ebooknet.com)* - eBookNet brings you the Web's most comprehensive e-Book industry news, tips for writers and publishers, listings and reviews of the latest e-Books, and vibrant community discussion about the e-book business.
- The Internet Book Information Center*(http://www.Internetbookinfo.com)* – in this project, which began in 1994, you can find a lot of information about Internet books.

# E-journals

We can find thousands of various newspapers and journals on the Internet today, and their number is increasing constantly. According the results of survey made in the summer 2000 by one of the biggest sociologicalresearch companies in Lithuania, *SIC Gallup Media*, electronic press is popular – 20 % of the Internet users from Lithuania are reading Lithuanian Internet publications, and 9 % - non-Lithuanian publications. Data of the same survey shows that users like electronic periodical publications, because: they are free (this is opinion of 35 % of all respondents); their old volumes are available (30 %); they present news more efficiently than "traditional" media (25 %); they enable searching by keyword (16 %). The tendencies in other countries are the same. In this section of the presentation we will concentrate on one kid of new electronic periodical media – the electronic journals.

## 1. Characteristics of e-journals

E-journals are serial publications available in digital format. Some electronic journals can be distributed on CD-ROMs, but usually they are located on the Web. Of the Internet-available ones, some are delivered over the World Wide Web, some by e-mail. Electronic journals can be free or available by subscription only. The e-journals can differ by their format: some e-journals are ASCII text, some are HTML WWW pages, and some use proprietary formats such as Adobe's PDF (portable document format). The earliest e-journals were distributed on CD-ROMs or diskettes during the 1970's, and were largely used in the library. The early efforts at networked distribution predated the World Wide Web. In 1987 *New Horizons in Adult Education*, the first peer-reviewed journal distributed on the Internet, made its debut, published by the Syracuse University Kellogg Project. It was ASCII text, free and distributed via a BITNET list server, with printed copies mailed to those who had no free access to BITNET. The first peer-reviewed, electronic, full text e-journal including graphics was OJCCT (*Online Journal of Current Clinical Trials*), first time published in 1992. It required specialised viewing software, since the WWW didn't exist yet. In 1993 JSTOR (Journal Storage Project) got underway as the first major retrospective electronic archiving project of printed journals. The same year Gophers became ubiquitousand changed everybody's idea of how publications should be delivered, but they were quickly replaced by the WWW, which gained a strong foothold in academia in 1994, and now we assume that e-journals will be delivered via the WWW.

### 1.1. Two basic types of e-journals

- "Parallel published" journals, with both printed and electronic versions available to the public; these can be divided in two more types: electronic clones of "published on paper" journals and electronic journals with "published on paper" copies.
- "Electronic" journals only, where there is an electronic version, the print option being available on demand.

### 1.2. The salient features of electronic journals available on the Web

- They can be delivered to the desktop;
- They can be read by more than one person at a time.
- Their text can be searched.
- They can include multimedia and graphics, in colour, at marginal cost.
- They can be published more quickly than paper publications.
- They can be interactive - that is, they can foster an online exchange of ideas by e-mail, forums, chat rooms, etc.
- They can take advantage of the ability to make hyperlinks, both internally and to other publications. This means that readers can link directly to references cited in an article and also, with additional effort on the part of publishers and indexers, to later articlesthat cite the article they are reading.
- Articles can be retrieved directly through links from abstracting and indexing databases.
- The content can be reproduced, forwarded, modified, leading to possible problems with copyright protection and preserving authenticity.

The main **disadvantage** is that, unless they are also printed on paper, they require specialised equipment for reading and, as mentioned before, reading on screen is not very comfortable for users.

### 1.3. Identifiers of e-journals.

The library and publishing worlds have always maintained identification schemes for locating and tracking titles, including LCCN, ISBN, ISSN, and Call numbers. Identifying individual print items, such as journal issues or articles, has been more difficult, but the identifier can still be linked to a physical piece. In the online world, identifying items becomes more difficult because the items are no longer physically tied together (bound, as it were). Individual journal articles need to be identified as "digital objects"; in fact, the article itself may consist of a number of digital objects (text, images, sound bites, links to citations, etc.) Today information is not discrete physical units like books or articles but web of objects without clear boundaries, not necessarily stored in the same location. Relevant recent standards for identifying objects, digital and otherwise, are the SICI (Serial Item and Contribution Identifier) code and the DOI (Digital Object Identifier). Schemes for persistent names for Internet addresses have also been developed, most notably OCLC's PURL (Persistent URL) system, and CNRI's Handles.

## 2. Creating e-journal

Creating electronic journal as periodical publication means creating Website, which will be regularly renewed? So before we turn to process of creating e-journal available on WWW,we have to dedicate some time for the basic concepts of the World Wide Web.

## 2.1. The World Wide Web

- *Structure of a Website*

Websites are at the heart of the World Wide Web. A Website is a location managed by an individual, group, organisation or company that provides information about specific areas of interest, products, services, general knowledge and so on. The Web has millions of Websites, each of which contains many Web pages. These pages use text, graphics, animations, and sometimes multimedia elements like video options and sounds. Websites often contain links to other Websites. Connecting between Websites by clicking on these links is known as 'surfing' the web.

- *The Website*

Web pages are collected together in Websites. Websites contain all the pages developed by an individual or company about a certain topic. Each Website has an opening, or home, page. Often the homepage will provide a site map or Website content listing. By clicking on entries within this listing, you will be connected with pages relating to each entry. You will usually be provided with an option to return to the homepage from each of these pages.

- *The Webpage*

Websites contain Webpages. They vary in size from just a few interlinked pages to corporate sites containing hundreds of elaborately constructed pages. A Webpage will often appear the same size and dimensions as the full-screen browser window on which you view it. It can also be a different size and shape. If the Webpage is bigger than your full-screen browser window, or the viewable area of the browser window on your screen, you can use scroll-bars found at the right-hand side and sometimes at the base of the screen to bring the information into view. Clicking on the arrows on the scroll-bars will move the information up and down, or left and right, to enable you to view it.

- *The components of Website addresses or URLs*

Each Website has a specific location on the Internet. A unique Web address or URL (Uniform Resource Locator) is allocated to each Webpage, which enables your browser to locate it. For example, a Webpage of Lithuania's National Library has the URL: *http://www.lnb.lt**'http://'*** stands for hypertext transfer protocol and indicates that the location you are seeking is on the Web, rather than one of the other areas of the Internet. *'www.lnb.lt'*is the domain name. ***'www'*** stands for World Wide Web. This shows that the site is a Website, although this is not always used. ***'lnb'*** indicates the company's Website homepage. ***'lt'*** the means it hails from Lithuania. American companies and multi-nationals usually use '.com' to stand for commercial and rarely use a country extension, although companies outside the US now sometimes also use .com. URL extensions are means by which you can identify the type of category into which a Website falls, although they are becoming increasingly confused.

## Examples of e-journals on Web

There thousands electronic journals in many languages on the Web. They present different themes, interests, views, and lifestyles. Here you will find several examples of different cultural e-journals you can access by the Internet. Read, enjoy and start preparing your own publication!

- Arts Journal *(http://www.artsjournal.com/)* - a weekday digest of some of the best artsand cultural journalism in the English-speaking world. Each day Arts Journal combs through more than 180 English-language newspapers, magazines and publications featuring writing about arts and culture.
- Ellavon*(http://www.ellavon.com/)* – a monthly e-journal, which offers, interviews, regular columns, fiction, cultural commentary, photography, with the occasional poem thrown in. It holds close to the intelligent and the new and it avoids the arcane.
- Flightless Humingbird*(http://www-personal.umich.edu/~rmutt/HomePage.html)* – a Pseudo-Periodical of Art, Paranoia, Eschatology and Fashion Tips.
- Frontera Magazine *(http://www.latino.com/index.phtml)* - print and online weekly magazine focusing on the music, art and culture of 20-something Latinos living in the U.S.
- Intercultural Communication *(http://www.immi.se/intercultural)* - the goal of the journal is to promote research, also education and training in the area of intercultural communication. The journal is an outgrowth of the activities of NIC the Nordic Network for Intercultural Communication.
- Cultural Critique *(http://www3.oup.co.uk/jnls/list/cultur/)* - the journal takes an interdisciplinary approach to cultural criticism, covering literary, philosophical, anthropological and sociological studies and using Marxist, feminist, psychoanalytic, and post-structural methods. It draws on a large group of international corresponding editors to gather articles that examine intellectual controversies, trends, and movements in various parts of the world.
- Invisible culture *(http://www.rochester.edu/in_visible_culture/ivchome.html)* - commentary and criticism relating to the production and analysis of cultural objects, addressing contemporary issues within visual studies.
- Baltolink: A critical Journal on the arts *(http://www.baltolink.org/)* – e-journal dedicated to progressive, serious and eccentric writings about art. It is a Baltimore-based publication, inclusive of the arts and artists in this area and around the world. And some more on these *collections of electronic periodical publications*:
- The Internet Public Library: Reading Room *(http://www.ipl.org/reading/serials)* -
- The IPL Reading Room Serials collection contains over 3000 titles that can be searched or browsed by subject or by title.
- New Jour *(http://gort.ucsd.edu/newjour/)* - the archive and and the Internet list for new journals and newsletters available on the Internet.

- Electronic Library *(http://wwws.elibrary.com/)* is a search system, which is searching for the information through various electronic publications: newspapers and journals, books and encyclopaedias, etc.

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## THEME 3

# Information Services and COVID-19

# Library e-Services during COVID-19 pandemic with special reference to selected engineering college libraries in Pune, Hyderabad and Kakinada

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## Abstract

*Libraries all over the world are confronting hard decisions around which services to offer and how, going from negligible limitations to full conclusion. Libraries in various areas of the world are confronting altogether different circumstances, from comprehensively keeping a full support of complete closure.During the COVID-19 pandemic circumstance, when information outbreak is enormous, it is an ideal opportunity to help the user community to remember the significance of libraries and the job of custodians in getting sorted out and dispersing the data.This survey has been led with a plan to research the situation with the three selected engineering college libraries of Pune, Hyderabad and Kakinada in giving library services through online including Social Media during lockdown. Structured*

*questionnaires were distributed to librarians of three randomly selected engineering college libraries of Pune,Hyderabad and Kakinada. The survey found from the outcomes that Email,WhatsApp is the most utilized e-service for conveying library resources during lockdown. The survey also highlights the purpose, adequacy and some major challenges and service provisions by libraries during this unprecedented COVID-19 period.*

***Keywords:****Library e-services, Social Media, COVID-19, engineering college libraries, Pune, Hyderabad, Kakinada*

## Introduction

Due to the coronavirus library services closed. Libraries move more than ever service online never have before. Libraries have new online services started and continued existence online services. Libraries and information centers accelerated transition to digital materials. Libraries procure more online contents and e resources like e-books, audio, video content and subscribing new databases in addition to present subscribed databases. Also an increased amount of educational e-resources and content put online through their digital platforms. Hosted virtual storytelling, engaged library staff to serve the community requirements and give support to the research scholars and groups for continuation of research programmes. Information professionals tuning Facebook and all social media live to fulfill the requirements of the user community. Libraries offer the same convenience to their user and create a central point in a website or blog for information about the library that can offer different kinds of services during a pandemic.

## Significance of the study

This study is immense as the revelations would help libraries in meaning of genuine procedure and effective strategies for using online services including Social Media for conveying library helps even more feasibly during COVID -19 pandemic later on.

## Objectives of the study

The fundamental objective of this review is to research the utilization of online media by the three selected engineering college libraries of Pune, Hyderabad and Kakinada for giving library associations during lockdown because of COVID-19. The particular are given underneath:

1. To find out the library e-services passed on through social media by college libraries of Pune, Hyderabad and Kakinada during lockdown.

2. To distinguish the various social media used by the one engineering library from Pune, Hyderabad and Kakinada for conveying library services during lockdown.

3. To study the efficiency and feasibility of online services including social media for conveying library services.

4. To understand the challenges faced by the college libraries of Pune, Hyderabad and Kakinada onthe use of social media during lockdown.

## Methodology

The present study based on a survey method using a structured online questionnaire and set a procedure was used for finishing the audit. Coordinated survey was shipped off the Librarians of the college libraries under study through email similarly as well as WhatsApp.

The present survey selected three cities of Maharashtra, Telangana and Andhra Pradesh. From each state selected one city engineering college for this study. These three engineering colleges are Dr DY Patil School of Engineering from Pune, CMR College of Engineering and Technology from Hyderabad and Ideal Institute of Technology from Kakinada. The total questionnaire was randomly distributed among the three selected engineering libraries of Pune, Hyderabad and Kakinada. The librarians circulated the questionnaire to their users through email and WhatsApp. The collected data were researched, coordinated and analyzed using MS-Excel.

## Data Analysis and Results

A full scale number of three studies were scattered among the Librarians of the one engineering college from each state.Under this survey 246 filled questionnaires out of 300 were received back with the response rate of 82%.

Table.1: Response of distributed questionnaire

| S.No | Distributed | Respondents | Percentage |
|---|---|---|---|
| 01 | 300 | 246 | 82% |

### 1. Gender wise distribution

The gender wise analysis data indicates the extent of response by male and female users. Table 2. presents gender wise distribution of respondents.

Table.2: Gender wise distribution

| S.No | Gender | Respondents | Percentage |
|---|---|---|---|
| 01 | Female | 138 | 56.1% |
| 02 | Male | 108 | 43.9% |
| | Total | 246 | 100% |

**Use of e-services including social media**

Table 3. Shows the 100% users using of social media and having knowledge of all social media

| S.No | Use of e-services including social media | Respondents | Percentage |
|---|---|---|---|
| 01 | Yes | 246 | 100% |
| 02 | No | 0 | 0% |

**Importance of using of e-services for delivering library resources**

Table 4. All of the three libraries thought of it as essential to use e-services for conveying library resources during covid-19 lockdown. According to survey 82% of them it is 'basic' and the next 18% is 'essential' to use e-services including Social Media for conveying library resources during lockdown.

| S.No | Use of e-services | Respondents | Percentage |
|---|---|---|---|
| 01 | Basic | 202 | 82% |
| 02 | Essential | 44 | 18% |
| 03 | Not important | 0 | 0% |

**E-services including social media used by the libraries during lockdown**

Table 5. survey reveals that emails, WhatsApp, SMS services used by all the three libraries and Facebook and website/Blog, telephonic service have been used by two libraries for conveying library resources during lockdown. Remote access, organised virtual events, webinars conducted by 66%, Twitter, LinkedIn and a few

other web-based media stages have been used by 33% of the libraries during lockdown.

| S.No | e-services | Service offered by libraries | Percentage |
|---|---|---|---|
| 01 | e-mail | 3 | 100% |
| 02 | Service via Website/blog | 2 | 66% |
| 03 | Facebook | 2 | 66% |
| 04 | Twitter | 1 | 33% |
| 05 | Whatsapp | 3 | 100% |
| 06 | Remote access | 2 | 66% |
| 07 | Organised virtual events | 2 | 66% |
| 08 | Webinars | 2 | 66% |
| 09 | SMS | 3 | 100% |
| 10 | Telephone service | 2 | 66% |
| 11 | LinkedIn | 1 | 33% |
| 12 | Youtube | 1 | 33% |
| 13 | Myspace | 0 | 0% |
| 14 | Flicker | 0 | 0% |

**Frequency of using e-services during lockdown**

The survey shows that 66% of the libraries under this audit using Social Media daily during the lockdown on account of COVID-19. 33% of the libraries using Social Media whenever it is essential to use.

**Purpose of using e-services during lockdown**

| S.No | e-services | Service offered by libraries | Percentage |
|---|---|---|---|

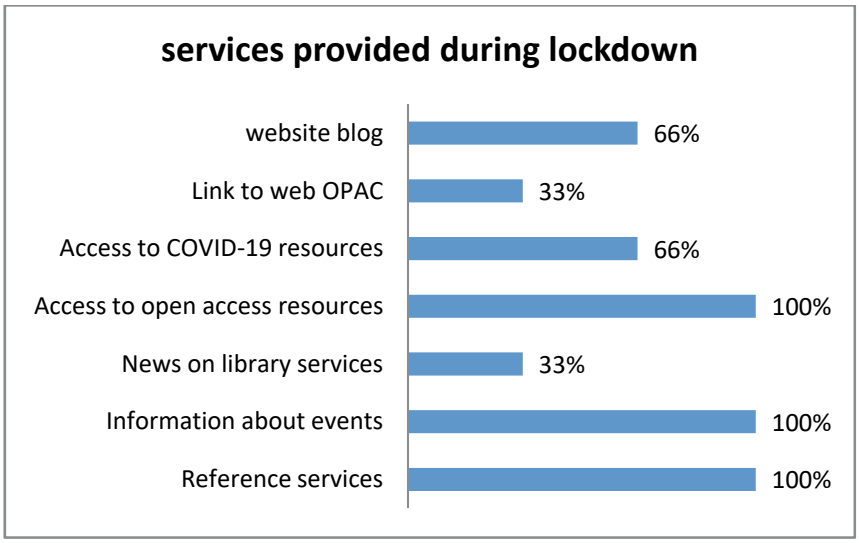
| | | | |
|---|---|---|---|
| 01 | to fulfill their user needs | 3 | 100% |
| 02 | to give awareness to the open access | 2 | 66% |
| 03 | to help the users during pandemic | 2 | 66% |
| 04 | to give permission to COVID-19 resources | 1 | 33% |
| 05 | give information related to academic and research | 3 | 100% |
| 06 | keep enlighten the regarding related materials | 2 | 66% |
| 07 | To share useful links | 2 | 66% |
| 08 | Covid updates | 2 | 66% |
| 09 | Information about programmes | 3 | 100% |
| 10 | SOP | 3 | 100% |

From table 6 it will in general be seen that 66% of libraries under this survey using the e-services with motivation 'to fulfill their clients' advantage'. The justification behind 66% libraries is 'to give permission to the open access assets'.33% of the libraries using e-services with the motivation 'to help the clients during pandemic'. The justification for 33% libraries is 'to give permission to COVID-19 resources'. As shown by 66% of the libraries, the inspiration driving using electronic media during lockdown is 'to give information related to educational and investigation reasons'. Of course 33% of libraries' inspiration for using electronic media is 'to keep enlightening the clients regarding related materials'.

**Services provided during COVID-19 lockdown**

The organizations given by the school libraries by using electronic media during lockdown tended to in the Fig.1. It might be seen that 100% of the libraries giving 'reference services' during lockdown through the internet. 'Information about academic programmes like webinars, web conferences etc., given by 100% of the libraries. 25% libraries under this audit giving 'news on covid'. 'Permission to open access resources' given by 100 percent of the libraries. 'Permission to COVID-19 resources' given by half of the libraries and 25% libraries given 'Association with Web OPAC' by the usage of social media during lockdown.

Fig 1. Services provided during lockdown




**COVID-19 and related information during lockdown**

| S.No | e-services | Service offered by libraries | Percentage |
|---|---|---|---|
| 01 | SOPs to Contain Spread of COVID-19 | 3 | 100% |
| 02 | Governments issued directives/ instructions | 2 | 66% |
| 03 | preventive measures | 2 | 66% |
| 04 | health guidelines | 1 | 33% |
| 05 | Vaccination centers and registration details | 1 | 33% |

The table 7. Shows covid 19 related information to the users .100% libraries given standard operating procedure contains spread of covid 19. 66% of libraries informed government issued directions and instructions and preventive measures

issued by various health apex bodies. 33% of libraries issued health guidelines and vaccination centers and registration details to their users.

**Adequacy of utilizing e-services during lockdown**

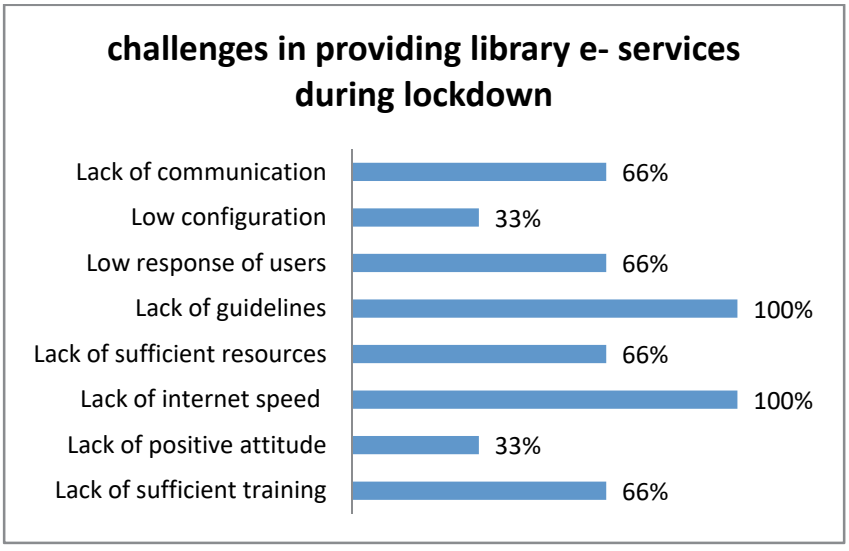
From Table 8. Indicates that effectiveness of the using e-services including social media for conveying libraries during lockdown. All the libraries, it is 'extremely beneficial' to use e-service for conveying libraries during lockdown.

| S.No | Adequacy of utilizing e-services including social media | Respondents | Percentage |
|---|---|---|---|
| 01 | Extremely beneficial | 246 | 100% |
| 02 | Dissatisfaction | 0 | 0% |

**Challenges in providing library e-services during lockdown**

Challenges in providing library e-services faced during looked by the all the libraries mainly lack of guidelines from the institution, lack of internet speed and limitation of internet data, 66% of lack of sufficient resources, lack of training, lack of communication between staff and users, 33% of issues on low configuration laptop/mobile, lack of positive attitude.

Fig 2. Challenges in providing library e-services



## Discussion

From the above response reveals that Email, WhatsApp, SMS are the most used (100 percent) e-services by the libraries during lockdown. This is followed by Remote access, Facebook, telephonic and Blog.As found in the result, 66% of the libraries raised 'low response of users' as a Challenge of passing library e-services on during lockdown. While 33% of the libraries found technical issues like configuration, attitude as one of the tests.

## Suggestions and recommendations

As we are going through an outstandingly earnest and predicament, the school libraries ought to expect obligation and really make their clients similarly as the public careful with respect to COVID-19 pandemic.

The survey reveals that all the libraries are offering various kinds of services to help the users. Except technical and policy matters all the library staff served their users without fail and time. The colleges should take on/characterize proper methodology for executing and working on the e-services. It is furthermore vital to show an inspiring viewpoint among the library professionals.

## Conclusion

In every crisis, there is a prerequisite for information and giving information permission to users is a social commitment of the libraries and the information work power. In this lockdown on account of COVID-19, the college libraries of Pune, Hyderabad and Kakinada have been loosening up their assistance to their typical users by giving library advantages and spreading information. They are moreover supporting the researchers and besides individuals overall by giving express resources and scattering information on COVID-19.

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# Library Services during COVID-19 Pandemic Crisis with special reference to Digital Library (M-Learning)

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**Abstract-**

*During COVID-19 pandemic situation, when information outbreak is enormous, it is the time to remind the society about the importance of libraries and their role in organizing and disseminating the information. In March 2020, in response to the initial spread of the COVID-19 pandemic, higher education institutions across the country quickly pivoted to online instruction while their libraries closed physical buildings, limited or eliminated access to print collections, and expanded digital offerings.Accurate information is the key to handle the chaotic situation. Exchange of false information seems to be on the rise. It has created a situation of 'infodemic' as stated by the Director-General of the World Health Organization (WHO). This has not only affected research work severely but has also created chaos among the laypeople. A library is the best resource to save people from rumors and misinformation in a pandemic. With physical libraries being shut, librarians play activerolein providing online information services to the general public. Many libraries are conducting information literacy programmes alerting people about COVID-19. It is suggested that during the locked down period, people can do leisure reading and writing. Moreover, through directed reading, bibliotherapy can be provided as therapeutic adjuvant in medicine and psychiatry in the solution of personal problems. Reader advisory services can be availed from the librarians via electronic media which may help in relieving the agony due to the pandemic and the lockdown situation.*

**Keywords**-:*Remote Services, Virtual Services, COVID-19, Pandemic, Digital library, Library access.*

## Introduction-:

Covid-19 has been global emergency, which is first and foremost a medical crisis, impacting every aspect of socio-political-economic life of the people. In March

2020, a major proportion of countries in the world decided to opt for complete lockdown to stop the spread of the corona virus. Like other countries, India had also declared complete lockdown from 23rd March 2020 onwards. All of a sudden, the closure of academic institutions and other learning spaces have obstructed 94 percent of the world's student population, whereas up to 99 percent in developing and least developing countries. During April 2020, worldwide, an estimated 1.58 billion school children and higher education students in 200 countries were affected by the COVID-19 outbreaks (UN,2020). This is an emergency, superseding all other existing emergencies, and thus academic staff did not get adequate time to respond to the crisis immediately. The unexpected lockdown had brought several challenges before the students, parents, teaching community and the management. Though some universities, colleges and schools were using online resources even prior to the Covid-19 crisis, the lockdown, forced higher education institutions and students to opt for digital resources and online platforms. Needless to say, those online platforms require a dedicated space at home, e-infrastructure, essential gadgets, quality internet service, electricity and data purchasing power. The new requirements at home pushed a large number of students into a vulnerable situation. Such groups could not utilize the available resources and online services offered by the university (library) during the closure of the university. In India, online education is a challenging situation, rather than an opportunity for progress. Broadly, half of the Indian population does not have access to the internet. States that during 2020 the internet penetration rate in India is around 50 percent; which means that half of the Indian population out of a total of 1.37 billion people does not have internet access.

## Library Services and COVID-19

The requirement for information exists in each emergency; library and library professionals must be prepared to address this issue whether it is for COVID-19 or something different. During a pandemic, the library should likewise proceed with help to its regular users. To break the chain of COVID-19 pandemic, almost all the colleges and universities around the world have been approached to close down and make an instant transition of face-to-face education to online learning within few weeks of time. This has created a challenge not only for libraries but also for students and teachers together, over and above the services that the libraries have

been providing prior to pandemic. Kuwait University Library conducted a survey on its use of electronic resources (ER) by the faculty of Kuwait University across the 12 colleges during the pandemic. The result shows that 60 percent of respondents were non-users of electronic resources, when physical access to the library was closed. The reasonsbehind not using the ER was unawareness of electronic resources, unawareness of how to use them and lack of needed resources. During any pandemic, there are three dimensions to a librarian's role: First, "To promote public health awareness by creating and disseminating information relating to preventive measures; second, to support research teams, researchers and faculty by providing information regarding the latest developments, research and literature; And third, to meet the core needs of regular library users".

Major publishers and e-resources providers were quick in responding to the pandemic and supported the librarians in their mission to deliver undisrupted and reliable information services to patrons. Here are some examples from prominent publishers:

- Sage created a Covid hub that includes podcasts, presentations, legislations, wellness essentials and more, https://www.sage.com/en-us/coronavirus/.
- Elsevier ScienceDirect compiled a resource packet that includes toolkits, resources for libraries' reopening and more, https://www.elsevier.com/connect/library-connect/covid-19-resources-for-librarians-and-their-library-users.
- Springer Nature launched a page 'Library resources to assist with the pandemic', https://www.springernature.com/gp/librarians/landing/covid19-library-resources.

Hybrid Libraries had to shift to digital in a short period during Covid-19.

**Initiatives Taken in Response to COVID-19**

To enhance the visibility of the resources and to ease the information searching library have provided a one stop solution by putting all the useful resources under one heading namely library services during COVID.

## Adapting to Remote Library Services during COVID-19

The changes happened quickly, and the librarians faced several challenges during this time, but things went smoothly overall and there were some considerable silver linings. Several of the newly adopted technologies, service models, and virtual resource offerings proved to be extremely effective and their use will continue beyond the duration of the pandemic.

## Need and Importance of Information

This ever-changing world never stops but grows exponentially and is full of surprises which are developmentally and technologically dynamic in nature. In the present society, information has become another basic need for human beings just like food, cloth, shelter and water. Our world has now transformed into an Information society. There is great need for accessibility, availability and accuracy of information.

## Reference Services:

Reference Service is an important personalized service in any library. Traditionally, it is a one-to-one service provided by the reference librarian to users. But the current definition of this service has been transformed by technological developments. There are basically two types of reference services, short range reference service and long-range reference service.

**Short Range Reference Service-** Short range reference service is provided immediately or within very short period. It answers the query quickly and takes one minute to 5 minutes. ... These reference sources may direct the reader to trace his information. Periodicals and pamphlets are also helpful in long range reference service.

**Long Range Reference Service-**Long range reference service indicates long time in providing reference service. This service is given: To special readers demanding special information's. Normally in long time, i.e. more than 5 minutes. With the help of reference sources.

**Information Services:** Information services are generally said to be the non-traditional type of services that connects readers and information (document) from a library or information centre. In this type of service, the emphasis is on providing the users with

exact information rather than a resource. The aim is to keep patrons upto-date in their field of interest or specialization by anticipating their needs.

**Current Awareness Services (CAS)**: CAS is a service that provides users with information on recent development and in fields which are of basic interest to the users. CAS informs users about new acquisitions/documents/e-resources that are recently purchased/received in their libraries. This service keeps the users well informed and up to date in their fields of special interest as well as in related subjects.

**Selective Dissemination of Information (SDI**): SDI is a form of CAS. SDI also keeps users in touch with the recent development and in fields which are of basic interest for the users. SDI supplies individuals or a group of users with the references of documents/resources relating to their predefined areas of interest.

**Document Delivery Service (DDS):**The DDS supplies documents to the user on demand either in original, its photocopy versions, or electronic delivery from a library collection to the residence of a library user, upon request. For this purpose, there are several Document Delivery Centres (DDC) that deliver the copies of papers from journals, conference proceedings, manuscripts, reports, images and other materials available in their collection/database. Most of these centres or libraries deliver documents free of cost to patrons.

**Abstracting and indexing services (I&A):**An abstract is considered to be a real surrogate of the document. Reading abstracts saves a lot of time for the researchers since they provide an overview of the paper. An abstract helps users get a clear idea about the real content without reading the whole document.

**WEB OPAC**: Online Public Access catalogue (OPAC) provides access to the catalogue of documents and resources procured by a library or a group of libraries through a computer terminal. It serves as a gateway to the resources collected and disseminated by a library. It allows searching the entire catalogue online, replacing the printed/hand-written card catalogues, conveniently and quickly, using one or more search criteria. It is a digital database of materials a library possess.

**Institutional Repository Service (IR**): D-Space is the institutional repository. Institutional Repositories collect and disseminate scholarly documents, in digital forms, of an institution's researchers, students and faculties' research works. It is the most essential resource in an organisation to promote its community members'

intellectual outputs. All the scholarly output of an institution is saved in the repository.

**Ask-a-librarian service:***"***Ask-a-librarian"** services are virtual reference services providing question and answer services which connect users with librarians, especially those individuals who are subject experts in that particular field and can conduct precise searches. Users can submit their queries by using web forms or through emails. Librarians provides online, on-demand assistance as quickly as possible, once they receive the query, no matter where they are.

**Library Bulletin**: The library bulletin is a periodical publication that publishes news about that particular library. These are generally meant for the members or users of that library. The messages may be directed to all users of the bulletin board or only to a particular user group. But all messages can be read by all. Bulletins are now made available in digital formats and mailed to users or displayed in library websites. Open Knowledge gateway RCSS Open Knowledge Gateway (ROKG) provides a platform to the researchers, faculty members and students of RCSS to access the free academic open access resources available on the internet without geographical limitations.

**Remote access to e-resources**: The main aim of academic libraries is to provide quality resources to students thereby strengthening the teaching-learning process. For this provision of necessary infrastructure and funds are inevitable. Most of the academic libraries have provision of remote access to subscribed e-resources and they are expanding the online services access to library e-resources, such as databases, e-books, e journals etc.

**Role of Librarians and Library Staff during the Pandemic and its effect on them**

All types of libraries including academic and public libraries found difficulties in providing the services to patrons. Those libraries which possess only physical documents or resources faced problems in providing their services whereas, libraries having significant e-resources served the users. Meanwhile libraries tried their best to be in connection with the users by conducting different programs such as reading competition, review writing competition, arranging virtual book-clubs and so on. Libraries and educational sectors conducted webinars through specific platforms such as zoom, Google meet, go to webinar apps etc. College and university libraries provided their e-content through their websites for easy access to their students and faculties. But not all are tech savvy and not all could equally

access the e-resources. Users faced so many problems including the connectivity issues and lack of updated systems and smart phones. This prevented them from accessing information from various sources. The library professionals are playing different roles in this pandemic period being online and offline, whether or not they are physically present in the library. They are also facing different challenges for providing timely services to the users by handling difficult situations. Librarians should have in-depth knowledge on the COVID-19 pandemic, its spread and transmission in order to provide useful information to the community and for the development of new strategies, policies, rules and regulations. As information professionals, librarians started to develop new skills in this pandemic period, enhanced the communication and working routines. They started finding new and creative ways through which information can be disseminated and steps to be adopted once the library re-opens for its functions and activities.

**UGC Initiatives during COVID-19**-:The UGC has released a list of initiatives using which the academic community can utilize their time as the country is in a lockdown due to the coronavirus outbreak. The initiatives include SWAYAM, MOOCs etc. These resources, which are in the form of digital platforms, can be accessed by the teachers, students and researchers in Universities and Colleges for broadening their horizon of learning. This initiative was informed to all UPES faculty members, students and research scholars. Following is the list of some of the initiatives along with their access links:

1. **SWAYAM online courses**: https://storage.googleapis.com/uniquecourses/online.html provides access to best teaching learning resources which were earlier delivered on the SWAYAM Platform may be now viewed by any learner free of cost without any registration.

2. **UG/PG MOOCs:** http://ugcmoocs.inflibnet.ac.in/ugcmoocs/moocs_courses.php hosts learning material of the SWAYAM UG and PG (Non-Technology) archived courses.

3. **e-PG Pathshala:** http://epgp.inflibnet.ac.in/ hosts high quality, curriculum-based, interactive e-content containing 23,000 modules (e-text and video) in 70 Post Graduate disciplines of social sciences, arts, fine arts and humanities, natural & mathematical sciences.,

4. **e-Content courseware in UG subjects**: e-content in 87 Undergraduate courses with about 24,110 e-content modules is available on the CEC website at http://cec.nic.in/

5**. SWAYAMPRABHA:** https://www.swayamprabha.gov.in/ is a group of 32 DTH channels providing high quality educational curriculum based course contents covering diverse disciplines such as arts, science, commerce, performing arts, social sciences and humanities subjects, engineering, technology, law, medicine, agriculture etc to all teachers, students and citizens across the country interested in lifelong learning.

6. **CEC-UGC YouTube channel:** http://www.youtube.com/user/cecedusat provides access to unlimited educational curriculum based lectures absolutely free.

7. **National Digital Library**: NDLI is a digital repository of a vast amount of academic content in different formats and provides interface support for leading Indian languages for all academic levels, including researchers and lifelong learners, all disciplines, all popular form of access devices and differently-abled learners. Students of Science, Engineering and Social Science streams can get benefited by visiting https://www.ndl.gov.in/ or https://ndl.iitkgp.ac.in/ and clicking "Corona Outbreak: Study from home" button on top to access, free of cost, Video lectures, Web courses Notes, Questions, Solutions, etc., on various subject areas they are studying, from authoritative sources to continue their study effectively during this difficult situation arising out of suspension of classes and closure of libraries due to COVID-19 Lockdown.

8**. Shodhganga**: https://shodhganaa.inflibnet.ac.in is a digital repository platform of 2,60,000 Indian Electronic Theses and Dissertations for research students to deposit their Ph.D. theses and make it available to the entire scholarly community in open access.

9. **e-Shodh Sindhu:** https://ess.inflibnet.ac.in/ provides current as well as archival access to more than 15,000 cores and peer-reviewed journals and a number of bibliographic, citation and factual databases in different Page 6 disciplines from a large number of publishers and aggregators to its member institutions, including centrally-funded technical institutions, universities and colleges that are covered under I2 (B) and 2 (f) Sections of the UGC Act.

List of web sites and organisations offering free access to millions of online books on a variety of topics is given below.

**Subscribed Resources - E-Book Databases**

| Sl No. | Resource Name | Web Address / URL |
|---|---|---|
| 1 | Bloomsbury Design Library | https://www.bloomsburydesignlibrary.com |
| 2 | Cambridge University Press | https://www.cambridge.org |
| 3 | CBS | https://eduport-global.com/ |
| 4 | EBC Reader | https://www.ebcreader.com/ |
| 5 | EBSCO University Science Collection | https://search.ebscohost.com |
| 6 | EBSCOHOST BusinessCore Collection | https://search.ebscohost.com |
| 7 | EBSCOHOST EngineeringCore Collection | https://search.ebscohost.com/ |
| 8 | EBSCOHOST ITCore collection | https://search.ebscohost.com/ |
| 9 | Elsevier Focus collection | https://www.sciencedirect.com/ |
| 10 | International Encyclopedia of Comparative Law Online | https://referenceworks.brillonline.com/ |
| 11 | Kopykitab | http://upes.kopykitab.com/ |
| 12 | McGraw Hill Education | http://mcgrawhilleducation.pdn.ipublishcentral.com/ |
| 13 | Oxford Handbooks Online | https://www.oxfordhandbooks.com/ |
| 14 | Oxford University Press | https://www.oxfordscholarship.com/ |
| 15 | Pearson Education | https://ebookcentral.proquest.com |
| 16 | ProQuest Business & Management Collection | https://ebookcentral.proquest.com |

## Preventive Measures and Guidelines / SOP for Libraries during Pandemic

Libraries are facing challenges and restrictions in the lockdown. Governments regularly are taking different approaches, sometimes ordering the full closure of all institutions, in these situations UPES adopted the following preventive measures to curb the spread of COVID19 through the libraries:

1. Stay at home if you feel sickness
2. Use appropriate sanitizer frequently

3. Roster of staff duty

4. Keep books at separate place at least for 48 hours when check in/check out

5. Maintain social distance

6. Follow good health and hygiene habits

7. Limiting concentration of users in reading room

8. Use mask and cover while sneezing or coughing

9. Avoid sneezing or coughing while handling books

10. Keeping surfaces clean, including library computers surface like door knobs, switches and railing etc.

11.Use online platforms or social media to share Knowledge/Information.

12.Provide remote access of library resources to the users

13.Promote paperless work culture in the libraries

14.Frequently used items such as magazines and newspapers may only be accessible to people with gloves and masks, etc.

**Conclusion-**

The global pandemic has impacted both positively and negatively on library services, users and effectiveness of library personnel who provide these services in many ways. The changes are visible and pronounced on operating traditional models,practices and corresponding interfaces. The challenges of using social media platforms affected library staff and patrons.Some of the challenges have opened the door for libraries to learn, become more equipped and fast tract the use of technologies. On the other hand, it suggest creativityand collaboration to ease past the unforeseenbarriers such as the one created by COVID-19.Even though, the COVID-19 crisis has brought the use of Telegram for the library complex in a manner that were in the past unseen or non-existentialsimply have demonstratedthat the potential of the library to provide an including and free e-content using the online platform is doable. The global pandemic and other disasters cannot and shouldnot rattle the essential role of a university librariesbefore, during, and afterwith appropriate and responsive measures put in place.

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# Information Services during Post COVID times: A Case study on 5 Health Science Libraries - Role of Libraries in promoting Open Access

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**ABSTRACT**

This article mainly identifies the prominent role played by the library professionals and it also emphasizes on the various roles taken up by the librarians during the pandemic. In spite of many challenges and uncertainties during the covid-19 pandemic, the librarians came up with best practices and many innovative ways of approaching services. The MNR 5 Health Science libraries and IT resources including the ground breaking MNR Central library 2004 have been contributing towards the ongoing development of the digital academic library. The Covid-19 pandemic has compelled the emergency and the necessity of evolving rapidly the leverage of digital skills, platforms, expertise and models of service delivery in order to provide continuously the exceptional and transformative experience to the MNR Higher Education and Research Campus (HERA) campus. E-resources, online digital platforms, online work teams, digital collections, remote services for archives and special collections are the initiatives discussed in this paper.

Keywords: Digital AcademicLibrary,Digital platforms, COVID-19, Digital Collections

## INTODUCTION

The MNR Higher Education and Research Campus (HERA) Campus of 2020 is profoundly changed since the World Health Organization (2020) declared the COVID-19 or corona virus outbreak as a pandemic on 11$^{th}$March 2020. Although concern about the corona virus was mounting in throughout the winter of 2020, few recognized how radically the world would change. As the virus spread through India and the death rates climbed, swift action was taken at the national and provincial levels to slow the spread of COVID-19. The MNR HERA Campus Libraries closed its libraries, galleries, and museums, sending 170 staff members home and leaving only essential workers on-site.

The MNR HERA Campus expanded its digital learning, learning and research rapidly within few weeks. The Health Science Libraries (Medical, Dental, BPT, Pharmacy and Nursing) librarians and staff of MNR HERA Campushave

enhanced their skills and expertise in digital initiatives to support students, researchers, faculty and the community at its peak times of the academic calendar. The main focus of this article is on the collection of operational adjustments, innovative solutions and the unexpected results so far. These include seven types of digital library services, three changes to collections, four changes in archives and special collections. Librarians are improved E-Resource facility for the benefits of students. The staff at MNR Central Library able to pivot to meet student, faculty, and staff information and research needs during the early months of the pandemic. The COVID-19 pandemic necessitated a rapid expansion of digital skills, platforms, expertise, and models of service delivery to continue providing exceptional and transformative experiences for the MNR HERA Campus, which will be shared in this article. A discussion of the limitations and plans for future service delivery will conclude this article. Additional challenges facing the institution include an economic recession and reductions to provincial post-secondary funding, necessitating that any service changes be implemented at a low cost.

## DIGITAL LIBRARY SERVICE DELIVERY

Seven types of digital library services were created or expanded during the first eight months of the pandemic. Of these, four were new and three were enhancements of existing services. Together, these initiatives worked towards the goals of remote staff teamwork, student engagement, collections access, remote information literacy instruction, and high-quality reference services. All these initiatives have been sustainable to be implemented at this moment, and it is anticipated that they will continue to be utilized.

## WORK TEAMS

In April 2020, the library senior leadership team initiated new interdepartmental digital work teams with mandates focused on creating transformative and indispensable services for the primary library user groups: undergraduates, Post graduates, and faculty. A fourth work team was established with a focus on broad online outreach and an enhanced social media presence.

All MNR staff and librarians were invited to join a team of their choice, and a team lead was also selected. The four work teams met in June 2020 to define terms of reference and goals in relation to their specific user group. An example mandate for the undergraduate support team was to (1) work collaboratively to establish user-centric, transformative, and indispensable programs and supports for undergraduate learners, and (2) respond to the need for increased digital content and resources due to the current and likely continued short-term surge in online and distance learning. Example priorities for the undergraduate support

team were to better understand undergraduate needs during this disruption; expand online communication, promotion, and outreach; decrease barriers and hurdles that undergraduate students may encounter; and work thoughtfully, collaboratively, and with vision for the future.

The team leads were directed by the senior leadership team to involve all team members in brainstorming and discussing new approaches to current challenges and library service models. The teams continue to work digitally, using Zoom and Microsoft Teams to meet and collaborate on impactful user-centric projects. The combinations of team members representing a variety of library departments have culminated in creativity, innovation, and staff engagement, even while working from home.

## MYLIBRARIAN

Personal librarian programs have demonstrated increased student engagement in academic libraries. A pilot group of MNR health Science librarians had been investigating the implementation of a personal librarian program since 2019. In 2020, with students learning from home and feeling disconnected from campus, a new student engagement program offered online was a welcome initiative to connect with students.

MyLibrarian personal librarian program was piloted in a soft launch in September 2020. It includes an opt-in program with newsletters, virtual events, and workshops, and new ways for students to be linked with a librarian or library staff member. Students can find "their librarian" by their discipline, which promotes the existing liaison librarian model with simpler personalized terminology. The program is the first of its kind to offer a way to connect with a librarian or library staff based on the student's personal background.The program and its content are focused towards, but not limited to, new incoming undergraduate students. It has been well received by new students and campus partners, and leverages existing subject-based support while offering new connections aimed at reducing the potential barriers facing students.

## THE DETAILS OF THE USING VARIOUS ONLINE DIGITAL PLATFORMS FOR DEFFERENT TYPES OF INFORMATION ARE GIVEN BELOW:-

- **National Digital Library of India (NDLI) *(https://ndl.iitkgp.ac.in)*:** It is the biggest digital library of India .Itis developed as a project under the MHRD, India. The Library was initially started as a pilot project form in May 2016. It was officially started by HRD minister Mr. Prakash Javadekar to serve the nation on June 19,2018.

- As of June 2020, NDLI has 48,582,080+ items in its repository. Items are available in more than 400 languages. 48 million items have been authored by 9 million authors. More than 100 types of eLearning resources areavailable.
- **Learning Resourcetypes:**
  - **Books:** 64+ lakhs books by 15+ lakhs authors in 250languages.
  - **Thesis:** 6+ lakhs thesis by researchers from differentinstitutes.
  - **Audio lectures:** More than 4116 lectures in English andTamil.
  - **Manuscript:** Manuscripts from Satyajit ray society, vidya prasarakMandal, JAINpedia, andothers.
  - **Articles:** More than 30 million articles by more than 25 million authors from different fields.
  - **Video lectures:** More than 30 lakhs video lectures from 35sources.
  - **Question Papers:** 64000+ question papers from 65+ sources.
  - **Web Courses:** Web courses from different domains like agriculture, physics,etc.
  - **Annual Reports:** Annual reports from 45sources.
  - **Solutions:** Solution of question papers of different schoolboards.
  - **Data Set:** Data sets from OECD iLibrary, south Asia archive, andothers.
  - **Reports:** 12+ lakhs reports from 71sources.
  - **Technical reports:** Technical reports from 38sources.
  - **Manuals:** Manuals from 20sources.
  - **Album:** Albums from 7Sources.
  - **Monograph:** monographs from 22sources.
- It is a single platform search engine to access digital contents available in India and any other country with somelimitations.
- In this Pandemic situation of COVID 19, NDLI works as a powerhouse of information for Indian Students/researchers/professors and others. For helping the student community in this pandemic situation where schools

,libraries and colleges are closed and physical access in these institutions have been suspended because of COVID-19 lockdown, NDLI has come up with a user oriented interface which is specially designed for digital collections of e-resources like e-books, e-journals etc. for specific groups of students & continuously enhancing its services. The Researchers, Professors, School & college students can visit the website of NDLI to access these e-resources free of cost & easily through the mobiles, laptops or computer systems. It hosts different types of study materials including books, questions papers, Journals, video lectures, model answers self- assessment, and solutions of various educational boards and National Council of Educational Research and Training (NCERT). NDLI also hosts preparation materials for competitive examinations like Joint Entrance Examination or JEE, NEET,etc.

- NDLI is constantly updating & upgrading these collections and services in this lockdown period. Updating & upgrading information of its services is periodically informed through its social networking platforms like Facebook, Twitter, etc. Stay tuned to NDLI & aware of thecommunity.

**NDLI social Media outreach through:**

- Facebook page:https://www.facebook.com/NDLIndia
- LinkedIn :https://in.linkedin.com/company/ndlindia
- Twitter :https://twitter.com/NDLIndia
- Instagram :https://www.instagram.com/NDLIndia/

**YUKTI PORTAL:** Government of India launched another portal "YUKTI" (Young India Combating COVID with Knowledge, Technology, and Innovation). It is developed to record and watch the efforts and initiatives of MHRD. It will cover a wide range of initiatives and efforts of the academics, research institutions which are especially associated with Covid-19 situations. Social responsibilities and initiatives by the various institutions are the measures taken for the betterment of the whole community of the students/young brigade. It will facilitate various institutions to share their way of working and their strategies for various challenges they are facing due to the unprecedented pandemic situation of Covid-19 coronavirus and other future goals and theirinitiatives.

It will establish a two-way channel between the MHRD .It will help to resolve various critical issues associated with student policies, placements related

problems, and the mental and physical well-being of scholars in these challenging times.

## ePGPATHSHALA:

**A gateway to all Postgraduate Courses *(http://epgp.inflibnet.ac.in/index.php)***: It is an initiative of the Ministry of Human resource development (MHRD) under its National Mission on Education through ICT (NME-ICT) which is executed by the University Grant Commission (UGC).A gateway which focuses on high quality education systems, curriculum-based teaching, interactive e-content in more than 70+ subjects across all disciplines of various subjects like social sciences, arts, fine arts and humanities, natural & mathematical sciences, etc.

As of June 2021, ePGPathshala provides 22000+ modules, 20000+ e-Text, 19000+ video,

30000+ quizzes & 723+ papers.

Library Professionals can suggest the ePGPathshala platform for postgraduate students, faculty members as well as researchers which can easily be accessed through mobile, laptop, or desktop systems.

**DELNET *(http://www.delnet.in/)***: It was initially supported by the Department of Scientific and Industrial Research, Government of India (DSIR), National Information System for Science and Technology (NISSAT). It was fully supported by the National Informatics Centre (NIC), Ministry of Culture, Government of India, Department of Information Technology, Ministry of Communications and InformationTechnology.

It was registered as a society in 1992. It promotes the sharing of resources among the library and acts as a bridge by collecting, storing, disseminating information, and helps in scientific research, technical guidance, coordinates in collection development, and facilitates referral, delivery of documents & exchange of information to local, national and international level.

**National Programme on Technology Enhanced Learning (NPTEL) *(http://nptel.ac.in/)*:**Itis a joint initiative of the prestigious institution of India IITs and IISc. Under this initiative, various online courses of different fields are available on a single platform and certification in various topics starting from engineering to humanities.

**Some highlights:**

- Largest online repository for various engineering subjects, few management courses, few social sciences and humanitiessubjects.
- More than 471+ millionviews.
- More than 52000+ hours of video content transcribed withsubtitles.
- It is the most subscribed educational channel on YouTube. There are more than 1.5+ million channel subscribers, 404+ million views, 56000+ VideoHours.
- It hosts more than 1 lakhs videolectures.
- It is the most accessed peer-reviewed educational content in theworld.

**Study Webs of Active-learning for Young Aspiring Minds (SWAYAM)** (***https://storage.googleapis.com/uniquecourses/online.html)*** **:**It is the India's first Massive open online course platform which is a initiated by the Indian Government and specially designed to achieve the basic objectives of Indian Education Policy.

The main objective of this platform is to provide the best teaching-learning platform and learning resources to students from class 9 to post graduation like Medical, Dental, Physiotherapy, pharmacy and Nursing. This platform can be easily accessible anytime from anywhere. It gives a strong platform for knowledge society & also provides a digital revolution in the field of teaching. In this Covid19 situation this type of platform is a very essential commodity for national knowledge growth and provides a backbone support for our MNR Medical, Dental, BPT and Nursing College students.

**The courses available on SWAYAM platform are classified into 4 parts –**

1. Printed study/reading material in Text/image form which can be easilydownloadable.
2. Video lectures by well qualified facultymembers.
3. In between Some tests and quizzes which are forself-assessment.
4. For clearing the doubt of the learners, an online discussion forum is available on this platform. Continuously updating takes place in terms of audio-video and multimedia and state of the artpedagogy/technology.

**E-RESOURCES:** The goal was to highlight currently available digital services during the pandemic while also introducing new users to library spaces. The team used existing technology equipment available in the library.

**MNR Central library have an e-Library with membership/subscription for the following:**

***e – journals / e-books consortia - Learning Resources:***

| S.No. | e-resources | Accessibility to students & Faculty |
|---|---|---|
| 1 | DELNET – Developing Library Network | ***http://www.delnet.in/***<br>***http://164.100.247.26***<br>**Username: tgmnrmch**<br>**Password: mnr7042** |
| 2 | NDLI- National Digital Library of India<br><br>NPTEL Video Lectures through NDLI | ***https://ndl.iitkgp.ac.in/***<br><br>**Free Registration with a user id and password** |
| 3 | Springer E-Books | **https://link.springer.com/**<br>free source |
| 4 | NPTEL | **https://nptel.ac.in/** |
| 5 | SWAYAM | ***https://swayam.gov.in*** |
| 6 | E-PG-Pathshala | ***https://epgp.inflibnet.ac.in/*** |
| 7 | COURSEERA | **https://wwwcoursera.otg/** |
| 8 | Medical E-Books | **http://medicalbooksfree.com/** |
| 9 | Wikibooks | **http://en.wikibooks.org/wiki/main_page** |

| | | |
|---|---|---|
| 10 | FUTURE LEARN | **https://www.futurelearn.com/** |
| 11 | World E-book Library | **http://worldebooklibrary.org/** |
| 12 | KnowledgeHub | **https://khub.net/group/guest** |
| 13 | National Mission of Manuscripts | ***https://www.namami.gov.in/*** |
| 14 | MEDLINEPLUS | **https://magazine.medlineplus.gov** |
| 15 | US Department of Vetarans Affairs | **https://www.va.gov/** |
| 16 | National Institute of health Sciences | **https://www.nih.gov/** |
| 17 | US Food & Drug Administration | **https://www.fda.gov/** |
| 18 | National Library of Medicine | **https://magazine.medlineplus.gov** |
| 19 | TRICARE | **https://tricare.mil/** |
| 20 | Military Health System | **https://health.mil/** |

**Digital instruction**

Librarians, archivists, curators, and other MNR staff participate in a variety of instruction for the campus community. As with all teaching on campus during the pandemic, library instruction rapidly shifted online, using platforms such as Zoom, Microsoft Teams, Gotowebinar, and webexmeet. When comparing library instruction statistics from the COVID-19 pandemic time period with the same period in the previous academic year, instruction has remained comparable, with a 15% decrease. There is likely a smaller difference than

reported, as not all most recently delivered instruction sessions have been entered and therefore captured in the data.

Further research might also explore differences in library instruction delivered digitally versus in-person. These statistics illustrate that librarians and staff adapted to online teaching and have maintained a capacity to promote and teach information literacy skill development on campus.

## TUTORIAL-VIDEO PRODUCTION

To provide more digital library instruction and way finding help, librarians and staff created new short online tutorials. These are being added to YouTube and social media, and embedded into FAQs (frequently asked questions) on the library website. To ensure the information in the videos is current to COVID-19 protocol, the undergraduate support team developed guidelines for standardized tutorial-video production. The MNR Digital Library houses four audio/visual editing suites, which were used to create screen recordings and professional-level audio. Intro and outro sequences, slides, and background music were created and approved to ensure a consistent look and feel for all the tutorial videos. All members of MNR Institutions were invited to narrate tutorials to create a diverse range of voices across the video collections. The guidelines determined by the team included using QuickTime software to create screen recordings and capture the audio narration simultaneously. The primary hosting platform is YouTube, which allows for easy embedding into other learning platforms, including FAQs and sharing on social media. Staff will monitor the use of these videos over the next year to gain insights into their effectiveness for student learning.

## CONTACTLESS PICKUP

From the outset, use of the library and the contactless book pickup service has been restricted to current MNR Campusofstudents, faculty, and staff. All individuals entering the building are required to show proof of Identity at the check-in desk. The desk is positioned immediately inside the entrance of the MNR Digital Library to assist in directing users to the book pickup and confirming computer and study space bookings.

The desk is equipped with a laptop for staff to confirm space bookings, a Plexiglas's barrier, face masks, a hand-sanitizing station, and a floor map of the bookable spaces. The purpose of the desk is not to answer circulation or reference questions, but to direct individuals to booked spaces or to requested material. This is to prevent lineups and extended exposure.

On 6 August 2020, the contactless book pickup service started. After a user places a request through the library catalogue, the item is pulled from the shelf, signed out to the user's account, and placed in a transparent bag with a hold slip positioned on top of the item(s). The requested items are placed on long folding tables and labeled corresponding to the users' last names. The user receives an email notifying them that the item is ready and providing details of how and where to collect the item. The pickup and grace periods have been extended to seven business days to ensure that users have sufficient time to collect their items. High volumes of requests were anticipated at the launch of the service. To provide relief to the team fulfilling and preparing the requests, each authorized user was restricted to a maximum of 10 active requests on their account. The pickup service experienced overwhelming success, with 1683 requests being made between 6 August and 17 October 2020.

## BOOKABLE STUDY SPACES

Bookable individual study and computer spaces began on 10 August 2020 in the MNR Digital Library. The ground floors of the buildinghas digital library with 40 computers and 40 individual study spaces. In mid-September, after the first week of the fall term, the first floor was opened, offering additional study and computer spaces. The library could offer a dedicated graduate study space in what was formerly a quiet reading room. On a typical day, approximately 15%–20% of the spaces are booked. For the December 2020 examination period, MNR Library removed all restrictions on the number of bookings an individual could make in a week, to provide students with additional access to study spaces.

## OUTDOOR TENT

After the contactless book pickup service commenced, it soon became evident that students wanted to be able to discuss their library account or, if they were new to campus, talk to a management staff member to help navigate the campus and learn more about what services were available. At that time, no other college department was providing in-person services. To address the lack of in-person student support, the outdoor tent was established on the quad outside the MNR Digital Library. The service was launched on 24 September 2020, two weeks prior to the first day of classes, and ran on weekdays from 10 a.m. to 2 p.m. Students, both new and returning, as well as staff and faculty, came to the desk and asked a wide variety of questions. On a typical day, staff answered from 30 to 80 questions over the four-hour period, indicating that the service was appreciated and filled a gap that was not addressed elsewhere on campus.

## CONCLUSION

As with our academic library colleagues across India and the world, MNR teams have endeavored to maintain a high level of service while complying with local safety measures to keep our staff and community safe. The COVID-19 pandemic has thrown into flux previous workflows and forced us to think creatively about new and innovative ways to continue providing indispensable and transformative services to our campus community. With an economic recession and reduced provincial post-secondary funding added to the scenario, it was necessary that the implementation costs of these initiatives remain low.

Despite these challenges, MNR HERA Campus has been able to work towards the strategic goals of enriching the quality of learning and engaging our library users, whether new undergraduates, Post graduate students, and faculty. Starting from a tradition of embracing digital tools and technologies, MNR Library has been able to leverage and enhance new digital initiatives to meet and exceed user expectations.

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# Library Services through Social Media during Lock down due to COVID-19 with Special Reference to University Library ofSVVU, Tirupati.

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## Abstract

*Libraries have been under closure due to lockdown enforced as a measure to tackle COVID19.This study has been conducted with an aim to investigate the status of the University Library and college libraries of SVVU in providing library services through Social Media during lockdown to theCollege Librarians of 3 in It is found from the results that WhatsApp is the most used social media for delivering library services during lockdown. The study also revealed that 'Access to open access resources' is the most delivered library service during lockdown. It was found beneficial by the libraries to use social media for delivering library services during lockdown. The study suggests that the library should provide information to make their users aware about COVID-19. The study concluded that the library users should make aware about the availability of social media services of the libraries for optimum utility of the service. . The study also revealed that 'Access to open access resources' is the most delivered library service during lockdown. It was found beneficial by the libraries to use social media for delivering library services during lockdown. 'Low response of user' was found to be the mostly faced challenge by the SVVU University Library of SVVU in delivering library services through social media during lockdown. The study suggests that the libraries should provide information to make their users aware about COVID-19. The study concluded that the library users should make aware about the availability of social media services of the library for optimum utility of the service.*

Keywords: *Library services, Social Media, COVID-19, College libraries, Andhra Pradesh*

**Introduction:** Introduction looking into the emergency situation caused due to COVID-19 (Corona Virus Disease 2019), Government of India initially called a nationwide lockdown for 21 days. Since then India has gone through 4 phases of lockdown [1st Phase: From 25th March to 14th April, 2020 (21 days), 2nd Phase: From 15th April to 3rd May, 2020 (19 days) and 3rd 2 Phase: From 4th May to 17th May, 2020 (14 days)], 4 th Phase: From 18th May to 31st May, 2020 (14 days). At present India has started unlocking with Unlock 1 from 1st June, 2020. During this pandemic situation all educational institutions are under suspension.

As time and tide wait for none, the institutions have been compelled to carry out all the possible academic activities through online mode. Social media is now an important part of many people's lives. In fact, a study suggests that half of the children who are aged between eight and seventeen years have social networking profiles like Facebook, Instagram etc. Not only the young people, but people of all ages, and all profession are using social networking sites as a means of communication.

Social media, as per recently observed fact, is playing an important part of any platform. Social media plays a dominant role in our day to day life. It creates a wide range of impact on people when it is shared on social media.

**What is Social Media**

Social media is a set of application and websites that provide users a platform for sharing anything and increasing their social net working.

**Why Do Students Use Social Media:**

Research has shown that over 95% of students have access to some sort of mobile device that connects to the internet meaning that using mobile technology for educational purposes with possibly excludes less than 5% of students.

**The top 5 reasons that have been found for students to use social media:**

1. Obtain new information
2. Keep in touch with friends
3. Facilitating work
4. Keep in touch with family
5. Chatting

**Importance Of Social Media For Students:**

Social media plays an important role in every student's life with the replacement of brick and mortar system of education with online classes, social media has become that bulletin board where you can get all the information about classes. Doubt clearing sessions, students and results. It also helps connect with their fellow mates to discuss and share information. The teachers too these days have taken up social media to interact with the students, educate them and clear their doubts.

**Role of Social Media To Students:**

Recent research conducted by Friday (2020) too has strengthened the role of social media for students through its various findings:

1. The research says that 64.4 percent of faculty use social media for their personal lives, 33.8 percent use it for teaching.
2. Also, the research has come up with the finding that 41 percent for those under age 35 compared to 30 percent for those over age 55 reported using social media in their teaching.
3. While facebook or linkedin is used for social and professional connection blogs and wikis are preferred for teaching.
4. 88 percent of faculty, regard less of discipline, reported using online video in the classrooms.

Benefits of Social Media:

- Educational benefits of social media: Online learning tools are more effective than traditional classroom learning (using textbooks for learning) because of the availability of online materials and 24 hours access to learning.
- Easy sharing of information: Sharing any information is just a click away with social media. Thus the students can share useful information, study material, projects, practice paper and other exam details with their friends and other fellow students
- It helps to gain wider knowledge: As social media has no border or boundaries, it helps the students connect with people from across the globe and gain wider knowledge.

- Share their knowledge: Social media also provides a great platform for students to share their knowledge.
- Shaping their future: Social media has opened various avenues for students to pursue. Based on one's skills and talent students can now learn the various future prospects that they can choose from instead of doing what others around them are doing
- Awareness: while earlier one did not have much scope to increase their awareness, with social media you can increase your awareness about any exam, subjects or a particular field of interest.

Adoption of Social media for Library services in the Covid 19

The declaration of Covid 19 pandemic in the world, the adoption of social media tools in SVVU library has been agitated for. To a large extent social media tools have been supportive for library services and have increased efficiency and quick information delivery to library patrons. Therefore, these social media tools have been adopted inSVVUlibrary services delivery.The adoption of social media

applications such as Zoom, face book,whatsApp,Remote access, you tube Twitter,Instagram etc., in rendering library services in SVVU Library is worth noted.

**Zoom Application**: Zoom is providing support to help navigate remote work and effectively use zoom during the Covid-19 pandemic. The SVVU Library can take place in learning process consisting of synchronous learning is carried out zoom meeting application during a pandemic. The SVVU Libraryis taking user orientation classes for UG students and regular class work for P.G studentsin one semester in zoom meeting, explaining the services that are available in the library and how to access online resources of the library.

**WhatsApp**: WhatsApp in libraries is a great initiative by Librarians. WhatsApp is one of the platforms, used for instant messaging.As it is very popular among the student community, the SVVU Library create an SVVU user whatsapp group.

The SVVU library delivered the following services to the users on whatsapp

1. Current Awareness service
2. Selective Dissemination of information
3. Reference service
4. Library news
5. Document searching
6. Reminders and Notifications

In Covid-19 pandemic the use of whatsapp in SVVU library is implemented for providing effective services. This is an instant messaging service. It will improve Library services. The users will get connected with the Library.

**FACE BOOK**: SVVU Library has taken special effort to make the print collection available to its users. They have compiled a list of course reading materials and provided a link to it and also introduced delivery of scanned pages of a chapter. SVVU Library created face book pages to communicate with their users and pass on resources of the library. Library can also adopt **chatbots** to offer users automatic answers to some common questions or links to different catalogs and inline databases and also linking to the library's website, the facebook page acts as a portal to the library.

**You tube**:The SVVU Library use their YouTube channel to provide library instructions such as how the users can browse the library databases or how the users can do a professional search process. These kinds of videos are uploaded and also some scanned copies of book materials are uploaded for the benefit of the user.

**Remote Accesses Service**: SVVU library can give the remote access service in covid-19 to the users all classes going on mostly online and many faculty members and other academicians working from home, it is imperative upon the library to extend remote access to their subscribed resources to their uses. A Gateway to accessing our digital resources like

- These e-Books
- Indiaagristat.co
- Krishikosh
- CeRA
- E –databases
- Science direct
- Data base tutorials

**Instagram :**

1. To ask users about their favourite authors.
2. To show off their surrounding and collection.
3. To publicise events.
4. To show its history.

**Twitter:** In the context of the library,Twitter can be used to broadcast information and thus build stronger bonds with users. Twitter provides SVVU Library with new opportunities to connect with the library users in COVID-19 pandemic in meaningful ways toshare information build community,start conversations and listen to users. SVVU Library use Twitter to promote programmes and services time to time.

**Advantages of Social Media**

- Social Media allows people to interact in ways we could never imagine, how we did till now without it.
- It is quite easy to catch up on someone's life through a simple message on the computer or mobile phone, even email.
- Social media enables communication for not only one's personal life but also for business life. E-commerce has become the largest platform for shopping online which not only helps buyers to purchase but also sellers to make business. Businesses have developed due to online advertisements or media sites because they get the word out quicker and faster.

- Now, people hardly go through newspapers for information or hardly look into newspapers for advertisements. Instead, all the ads are posted online on social media such as Twitter or Facebook which are viewed by more people.
- As technology is rapidly growing and everything has become online and to meet this rapidly growing technology everything has to be available on the internet. People started adopting digital marketing instead of marketing offline and social media plays a vital role in promoting online business.
- Social media has made people's lives easier and has become an integral part of one's life.

The only concern is that the social media which is rapidly increasing can make teenagers addictive to the internet. But, as long as they are properly monitored and used in the correct way, social media will continue to grow rapidly.

## Conclusion:

It can be concluded that the library users should make aware about the availability of social media services of the library for optimum utility of the service. It can also be noted that 'Access to open access resources' is the most delivered library service during lockdown. It was found beneficial by the libraries to use social media for delivering library services during lockdown. 'Low response of user' was found to be the mostly faced challenge by the SVVU University Library of SVVU in delivering library services through social media during lockdown. The study suggests that the libraries should provide information to make their users aware about COVID-19. To conclude, the library users should make aware of the availability of social media services of the libraries for optimum utility of the service.

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# Information Services During Post Covid Times: Case Studies – Role Of Libraries In Promoting Open Access

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## ABSTRACT

*A humongous number of reported cases increased until most went into complete lockdown around March 2020. Due to the governments' declarations of lockdown and COVID19 protocols, university closures became unavoidable, and libraries could not be spared. It is well known that the library is an "essential service" that provides users with virtual programs and information services. During these trying times, the importance of providing educational and health information to all cannot be overstated. As online lessons became the norm, libraries had to find new ways to reach out to patrons.During the complete lockdown, the Tamil Nadu Agriculture University had to find ways to respond to the pandemic, so an effort was made to achieve better services to users through various activities.*

**Keywords:***Open Access, Institutional repositories, Digital libraries, Usability and COVID 19*

## INTRODUCTION

The current paper describes how a university library at Tamil Nadu Agricultural University in Coimbatore redesigned its Institutional Repository (IR) using user research and usability principles. It emphasizes the importance of engaging with researchers and faculty members to gain buy-in and support for the repository, as well as how successful collaboration can lead to increased usage and reach of open access materials. The Corona Virus/Covid-19 pandemic has altered library and librarian activities all over the world. The International Federation of Library Association (IFLA) has observed that this pandemic has forced libraries to close their doors for the benefit of their patrons and staff (IFLA, 2020). There have been significant changes in the way services are provided, as well as in how libraries communicate with and support those who rely on them for access to information and culture. In the world of libraries, the emergence of the "new normal" has been evident. University libraries are experiencing uncertainty as they

prepare to meet the needs of their users. The Covid-19 Pandemic has resulted in a massive learning curve in many areas of libraries, as well as a shift in the 'settings' of the library field due to an accelerated rate of development. Following the outbreak of COVID-19 in January 2020, the world experienced a health crisis (AJMC-The Center for Biosimilars, 2021). A substantial number of reported cases improved until enough went into complete lockdown around March 2020. Due to the governments' declarations of lockdown and COVID19 protocols, campus furloughs became unavoidable, and libraries could not be spared. It is well known that the library is an "essential service" that provides users with virtual programmes and information services. During these trying times, the importance of providing educational and health information to all cannot be overstated. As online lessons became the norm, libraries had to find new ways to reach out to patrons.Access to the library building, electronic resources, and other services are among them. The need for libraries to provide information services to cater to online classes has reached an all-time high, as the majority of classes are now offered online. To enable digital distribution of content to learners, the library needed to look into ways to invest more in digital infrastructure. As the academic heart of the university's objectives, the Library had to grapple with social distancing and building constraints. An improvement or step forward in terms of providing students with information services that meet their needs. The Tamil Nadu Campus is situated in the kingdom of Agriculture.It is based in the Coimbatore region and has two campuses within a 50-kilometer radius of each other, with the main campus in Coimbatore and the Forest College and Research Institute in Mettupalayam. Since the beginning of the pandemic, the University of College libraries have had to update their library website and increase their social media presence to provide updated COVID-19 information, including local mitigation efforts. It increased access to e-books, databases, and e-resources for educational purposes. These resources were not available outside of the university. Users were encouraged to use their logins to access these for authentication and security purposes.

## METHODOLOGY

As a large Tamil Nadu Agricultural University, the issues surrounding institutional repositories prompted us to consider a user experience approach (Garrett, 2010) to redesign the institutional repository. We received a detailed report on the repository from the initial usability testing, which included usability analysis, navigability, and design recommendations. The report made use of a variety of usability, accessibility, and information architecture tools and methodologies, such as a usability and information architecture review checklist report, the WAVE Connectivity Tools, a Heuristic Evaluation, user journey mapping, and workflow analysis. Several user-friendliness and accessibility

standards, as well as practice guidelines for user interface, were evaluated by the IR.In addition, we conducted a study of academics and their reasons for adoption or non-adoption, which confirmed many of the issues identified in usability testing and emphasized some of the concerns discussed in the literature.

## RESEARCH DESIGN

This research-informed study and redesign, which was the result of collaboration between library users and researchers, was theoretically grounded in user experience principles and resulted in a complete, re-design of the repository, replacing the native D-Space interface with a customized, interactive interface that addressed many of the usability issues.

## LIBRARY BUILDING ACCESS

When the lockdown began, many students fled with library materials. The Tamil Nadu Agricultural University library ensured that access to library resources was supported by waiving fines for students and staff. Since the lockdown, they have been granted amnesty in terms of returning library materials. This was done because the library buildings on all three campuses were closed and then reopened on a limited basis. Weekday hours were 8 a.m. to 7 p.m., Saturday hours were 9.00 a.m. to 5.00 p.m., and Sundays were closed. The library buildings were only accessible to staff and students who had been granted permission by the university to return, i.e. completed undergraduate students, postgraduate students, and research scholars.The number of people who could enter the building was reduced by more than half. The Tamil Nadu Agricultural University campus library, for example, has a seating capacity of +/-500 users but has been reduced to 200 desk users and 24 carrel users. To maintain social distance, non-seating areas were delineated. The Forest College and Research Institute Campus Library have a seating capacity of +/-100 users, which has already been reduced to 30 seated at carrels at desks 4 and 5.

## ACCESS TO ONLINE, PHYSICAL MATERIALS AND INSTRUCTIONAL SUPPORT

Users were informed via notices that they should visit the Library OPAC and follow the links provided on the website for teaching and learning materials. Direct access to materials such as databases, articles, books, e-books, and streaming video was among them (TNAU College Libraries, 2020).

They had remote access and instructions to find books, ebooks, streaming media, and more.

- Find databases and articles for research
- Find the Library Information Development Centre for World Bank online resources
- Examine our EBook user guide to learn how to search for E-books in the OPAC.

Through the "Request online or in-person instruction for your course-related to research, writing, or multimedia" option, the library assisted faculty in teaching online courses. Staff was given instructions on how to search for eBooks for use in online courses. Users were directed to the links where introductions to the library facilities were provided for navigating around the website for a virtual introduction to the library facilities.

## HEALTH AND SAFETY MEASURES IN THE LIBRARY

There was a greater physical separation put in place. To encourage social distancing of 2-meter distances, signs and floor markings were created and posted. The space between study desks was also increased to 2 meters to allow for physical barriers and/or physical distancing. In addition, computer and space seating were modified to comply with the local guide. For sanitation reasons, the discussion area/room was temporarily closed to large groups, and study room use was limited to one individual at a time, accessible only by checkout. Seating in the Booth was also limited. At all times, a staff member was stationed at the main library desk.

## REDUCING POTENTIAL SPREAD

In terms of the mitigating spread of diseases, additional tissues, cleaning supplies, and hand sanitizer were made available to staff and users. Users were instructed to return all items to the circulation desk dropbox, where staff would quarantine all incoming items for a minimum of 72 hours by COVID team quality standards. Books and journals taken from study desks are not immediately shelved, but are quarantined for 24 hours before being shelved.Shared workspaces and study room spaces were regularly sanitised between uses, and patrons were encouraged to continue using remote assistance and scheduling appointments for in-person assistance for more complex reference questions via emails for a virtual session.

The library regulated entry into the library by requiring registration at the entrance, where staff and users were permitted to enter the library building only after registering. The register was intended for use in contact tracing. Appointments were strongly encouraged over walk-in traffic. If a case is linked to a library contact, the library will be closed for sanitization.

## PROMOTING HEALTHY HABITS AND GOOD HYGIENE

Signs promoting physical separation, face mask use, healthy hygiene, and traffic flow were placed on all library floors. Patrons were asked to review the new policies regarding social distancing and environmental health.

## ADDITIONAL SERVICES

Self-service Photocopying was suspended, and the photocopiers were operated by the library staff using the photocopying cards of the users. After each use, photocopiers and computers were disinfected.

## DIFFICULTIES EXPERIENCED

The Tamil Nadu Agricultural University library, like many others, faced some challenges during this time, including a lack of funds for E-resources, particularly to enable remote digital access. Because the University only recently began acquiring e-books, the collection is still small. Furthermore, users' inability to access resources remotely was hampered by a lack of technological devices. To top it all off, for many of the student users, the expensive (Lancaster & Lange, 2020) internet access in the College library was a thorny issue that hampered their access to the library resources.

## OBJECTIVE AND SCOPE

The Journal of Learning Spaces, a peer-reviewed, open-access journal published biannually, provides a scholarly, multidisciplinary forum for research articles, case studies, book reviews, and position papers on all aspects of learning space design, operation, pedagogy, and assessment in higher education. Learning is defined as the process of acquiring knowledge, skill, or understanding through study, experience, or teaching. Learning environments are intended to aid, facilitate, stimulate, or improve learning and teaching. Learning environments can be formal, informal, or virtual.

## CONCLUSION

Users argue that greater collaboration between library staff and research scholars is essential based on increased active participation with the Repository following user research and the resulting redesign. Moreover, discussion with all end users - whether they are authors, fellow researchers, or other information seekers - is required to develop a system that meets the needs of each user group.

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# Re-Engineering of Library And Information Services of Medical Colleges in Rajasthan

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## ABSTRACT

*Reengineering remains a conventional management method. To meet patron expectations and needs effectively and efficiently, reengineering library resources and services is very necessary in the fast-changing information age. Medical College Library of Rajasthan presents various aspects and approaches to re-engineering to provide resources and services to its users. Manifestation of the new improved processes and actions needed to implement them.*

Kewords: *Re-engineering. Medical Collage, Library Services*

## INTRODUCTION

In order to meet patron expectations and needs effectively and efficiently, it is imperative that library resources and services are provided. Reengineering is considered a very conventional management technique. Reengineering is a necessity in the information age.Today, librarians must accept new skills in order to provide better service to their customers. Because of the widespread use of ICT in libraries, libraries have been forced to rethink their programmes and processes in order to keep activethroughalteringsurroundings. Subsequently, in the currentage, libraries are undergoing radicalvariation as a result of advancedevidence and statementexpertise and must be re-engineered to expressionmanytasks such as technological development, inexpensivedecrease, operativeconsummation, imperfectcorporalplanetary, and incapability to fiscallyweather themselves. Such deviations occur at a breakneck pace. To adapt to the aforementioned changes, we must first change our way of thinking.

Re-designing affirms not suggest joining another PC framework into a current framework (for example supplanting a manual framework). It is totally the adjustment of a current framework by a PC framework or another human-based framework, and it can even overhaul the current PC based framework with a human-based framework.

## REENGINEERING: MEANING & DEFINITIONS

Compressions to reduce charges, shorten roundperiods, improve value, besides create place of work procedures extra efficient and focused in general. However, Michael Hammer coined the term "re-engineering" in 1990 in a Harward Business Review article titled "Re-engineering Work: Don't Automate Obliterate."Reengineering is most commonly definite as the reshape of a commercialprocedure, and the related structures and organization structures, in order to accomplish a significant development in the commercial procedure. It is a managing utensil that gained popularity trendy the nighttime 1980s and initial 1990s through the purpose of reducing prices, improving efficiency, and offering higher levels of service.It entails identifying, evaluating, and redesigning crucialproceduresthoughpossession the client at the forefront of the procedurereshape. The need to stay competitive in today's business environment is at the core of reengineering.

## REQUIREMENTS OF REENGINEERING

The future exploration work will attempt to discover a response to this inquiry with the use of Re-Engineering of Library and Information Services of Medical Colleges in Rajasthan.

- To extend library benefits and further develop library administrations.
- The fast extension and execution of ICT in the library.
- To adjust the open library methodology and acknowledge an electronic climate inside a customary library structure.
- To eliminate library administrative work.
- Remarkable according to the data blast
- To resolve the issues raised by the data blast and innovative upheaval.
- To meet the Library Users' diverse data needs.
- To re - plan the Library's data and administrations with the goal that the top potential administrations are given to the objective clients.
- To give exhaustive and dependable data to end-clients of

## REENGINEERING PROCESS PREPARATION

**DETERMINE THE ACTIONS:** First, it categorizes the library facilitiesbefore actions that can be reengineered. The main points which need to be s actually with day librarian assistance, traditional library design, academic libraries collection, and so on.Medical College Librarian Physical Layout/Facilities. Medical College Traditional Library Manual Processes of Library Daily cleaning Processes.

Examine the current process: most libraries take a bodily assortment. This assembl age must remain correctly organized on a shelf. The card dataset is accessible for retrieving the document, but it does not provide search results as quickly as an online catalogue.

## RE-ENGINEERING TEAM SELECTION:

For a successful re-engineering of the Medical College Library, anqualifiedcrew of authoritiesmuststand used to reshape the Institute Of medical sciences Library's Library & Information Services.

## THE IMPORTANCE OF CURRENT PROCEDURES IN MEDICAL COLLEGE LIBRARY

Most Medical College Libraries' most noteworthy cycles and in-house library tasks, for example, Manual cycle performed errands incorporate securing, listing, dissemination, serials control, and an assortment of reports. The utilization of data innovation for library activities is exceptionally low.

### SPECTER USED FOR THE CREATIVELY UPGRADED PROCEDURE:

**SPECTER:** We are focused on giving clear, basic, and thorough admittance to Library assets for refreshing Users' and Staff's ability establishments. We are still up in the air endeavors to incorporate our Library into an extraordinary field of data spread.

### MEASURES

Activities required toward implement before reform the innovative process Physical Design/Services of the Medical College Library In demand toward deliver improved amenities to handlers, the Physical Design/Services of the Medical College Library may be configured as surveys:

- MoundChamber Separate
- Computer Research laboratory (E-Library) with a sufficient number of computers with Broad Band Connectivity
- A distinct OrientationUnit
- Unit for Reprographics (Photocopies)
- Unit of Processing
- Aisolatedchalet for the Librarian and Assistant Librarian

**PROCESS OF DESIGN AND DOCUMENT REVISION**: The physical layout of the library must include following features to help responsive or provide greater services to the users:

**IMPORTANT Re - engineering AREAS IN LIBRARIES**

The assessment, study, catch, and change of the inner systems or usefulness of existing practices in an association to reassemble them in a recent fad with new highlights and to exploit recently arose or wanted authoritative necessities and mechanical abilities is known as re-designing. As the computerized upset an affects each part of life,process of the library like securing, specialized It is accepted that libraries must re-engineer each course of the library, like obtaining, specialized handling, client administrations, human asset improvement, and monetary administration, among others.

## RECONSTRUCTING THE LIBRARY COLLECTION

To face the tasks of library users' inforequirements, the library assortmentmust be built in ordinalarrangement. It could include:

- CDs, DVDs, Microfilms, and so on.
- Online journals, online books, and online databases are all examples of online resources.
- Sources of e-reference
- Participation in e-consortia

## REENGINEERING HOUSEWORKWORKINGSTRUCTURES

Responsible for propelling the adequacy of the library's housekeeping activities should standard library programming can be utilized to computerize The library's housekeeping tasks ought to be updated in the accompanying way with the assistance and backing of data innovation.

- Acquisition system that is automated.
- Cataloguing systems that are computerized
- Rotationscheme that is automatic.
- Regulatorstructure for automatic Serials.
- Reportagestructure that is automatic.
- Scheme for Electronic Stock Verification

## REENGINEERED LIBRARY AND INFORMATION SERVICES:

ICT may be used in the mentioned ways in order to redefine these Information And services:

- ❖ E-mail CAS and SDI services
- ❖ System for retrieving information online.
- ❖ Online resource sharing
- ❖ Service de référence numérique
- ❖ Repository for institutional use.

## REENGINEERING OF INFOPOSSESSIONS

Due to the steadily expanding expenses of distributions, an individual or library can't bear to purchase each book of significance. In these conditions, to effectively meet individual data needs, clients are searching for digital books and simple admittance to the most modern data, which is drawing in an expanding number of clients to the utilization of digital books.

## OBJECTS OF THE PLANNED STUDY

- To explore the current climate of the school libraries, including approaches, terms, collocation, client conduct in utilizing data, library computerization, and offices given by the libraries. School library organization arrangements, the situation with school libraries, the situation with school curators, and the nature of data administrations
- To underscore the essentials of re-designing administration in the separate school libraries.
- To learn best practices, put out clear objectives, and impart the requirement for change all through the association.
- To give the best and most proficient electronic just as e-learning help to the client local area.
- To suggest proper measures for reengineering library and data administrations at the particular school library.

## RESEARCH DESIGN

The flow study's information was assembled from the Medical College Library, just as clients (employees, research researchers, and understudies) from different schools in Rajasthan. The review was essentially founded on essential and optional information gathered from Medical College Library clients through a very much planned survey during the information assortment process. Clinical College libraries of scholastic establishments and their clients (employees, research researchers, and understudies) were met face to face to explain any inquiries brought up in the survey. Optional information was assembled from course readings, reference books, public and global diaries, magazines, and school sites.

The exploration project was utilizing basic irregular inspecting technique to distinguish Medical College Libraries and Medical College clients (employees, specialists, research researchers, and understudies) from Rajasthan Medical Colleges.A survey was intended to gather the information and significant data on different parts of the Study of "**RE-ENGINEERING OF LIBRARY AND INFORMATION SERVICES OF MEDICAL COLLEGE IN RAJASTHAN".**

The surveys were shipped off the Medical Colleges and their clients (employees, Doctors, research researchers, and understudies) of Rajasthan. The surveys were not reacted to inside one month; they were given updates and sought after sending their reactions. At last, 08 Medical schools and 345 clients' properly filled surveys have been gotten back according to guidance. These surveys have been investigated and controlled for classification and measurable examination, where there were required in the proposed review.

**GENERAL INFORMATION OF MEDICAL COLLEGES IN RAJASTHAN**

## NAME OF LIBRARY AND TYPE OF LIBRARY BUILDING

The chief library structure is separated into units such as authorities, procurement, rotation, classification, proceduraldispensation, book pile summary, reference procurement category, print publication segment, bound volume section, sound section, and computer corner, among others. The Medical Council of India (MCI) requires that separately medical college consumeextents of the central library built on the annual intake of students allowable or recognized by the MCI.

## LIBRARY TIMING (LIBRARY HOURS)

The timing of the library stands anvital element in healthcare institutions for both scholars and facility followers. Library periods in having learned organisations need to be more open and accepting to users. The main objective of the working time is to establish the similar purpose of all users even as allowing the library to work as quickly as possible. As a result, this question was posed in order to elicit information about each institution's library occupied times by way of well perusing area periods.

**TABLE 1LIBRARY SHIFTS AND TIMING IN MEDICAL COLLEGE LIBRARIES OF RAJASTHAN**

| S.No. | College Code | Shifts | Library Timing (Hours ) |
|---|---|---|---|
| 1. | JNMC | 3 Shifts | 18 |
| 2. | SPMC | 3 Shifts | 18 |
| 3. | SMC | 3 Shifts | 18 |
| 4. | AIIMS | 3 Shifts | 18 |
| 5. | MGMC | 3 Shifts | 18 |
| 6. | RUHS | 2 Shifts | 12 |
| 7. | AIMS & RC | 3 Shifts | 18 |
| 8. | RNTMC | 3 Shifts | 18 |

**TABLE NO. 2 LIBRARY TIMINGS**

| | | | |
|---|---|---|---|
| **S.No.** | **Library Timing ( Hours)** | **No. of College** | **Ratio** |
| 1 | 18 | 07 | 87.5 |
| 2 | 12 | 01 | 12.5 |
| | **Total** | 08 | 100 |

**TABLE NO: 3 GENDER-WISE ACCUSED (NUMERICALEXAMINATION)**

| S.No. | Gender | No. Of Suspect | Ratio |
|---|---|---|---|
| 1. | Man | 180 | 52.02 |
| 2. | Feminine | 165 | 47.08 |
| | **Total** | **345** | **100** |

**TABLE: 4 RE-ENGINEERING IS DESIRED IN THE ADMINISTRATION OF THE MEDICAL LIBRARIES IN THE FRAMEWORK OF THE CURRENTINFO AND COMMUNICATION**

| S.NO. | College Code (Technology changed environment | Yes | NO |
|---|---|---|---|
| 1. | JNMC | Absolutely | - |
| 2. | SPMC | Absolutely | - |
| 3. | SMC | Absolutely | - |
| 4. | AIIMS | Absolutely | - |
| 5. | MGMC | Absolutely | - |
| 6. | RUHS | Absolutely | - |
| 7. | AIMS & RC | Absolutely | - |
| 8. | RNTMC | Absolutely | - |

**TABLE: 4.1INTERACTION OF RE-ENGINEERING IS APPLIED TO MEDICAL COLLEGE LIBRARY**

| S.NO. | College Code (Re-Engineering Applied) | Yes | NO |
|---|---|---|---|
| 1. | JNMC | - | No |
| 2. | SPMC | Yes | - |
| 3. | SMC | Yes | - |
| 4. | AIIMS | Yes | - |
| 5. | MGMC | Yes | - |
| 6. | RUHS | Yes | - |
| 7. | AIMS & RC | Yes | - |
| 8. | RNTMC | Yes | - |

**TABLE: 4.2 PROCESS OF RE-ENGINEERING AND RE-DEFINE GOALS OPERATION OF MEDICAL COLLEGE LIBRARY TO MODERN REQUIREMENTS AND USERS NEEDS**

| S.NO. | College Code (Modern Req. And User'sNeeds) | Yes | NO |
|---|---|---|---|
| 1. | JNMC | Yes | - |
| 2. | SPMC | Yes | - |
| 3. | SMC | Yes | - |
| 4. | AIIMS | Yes | - |
| 5. | MGMC | Yes | - |
| 6. | RUHS | Yes | - |
| 7. | AIMS & RC | Yes | - |
| 8. | RNTMC | Yes | - |

**TABLE: 4.3 STAGE OF RE-ENGINEERING IN MEDICAL COLLEGE LIBRARY**

| S.NO. | College Code | Planning Stage | Applied Some Ideas | Modified Major Operations | Fully Changed |
|---|---|---|---|---|---|
| 1. | JNMC | √ | - | - | - |
| 2. | SPMC | | √ | - | - |
| 3. | SMC | √ | - | - | - |
| 4. | AIIMS | √ | - | - | - |
| 5. | MGMC | - | - | √ | - |
| 6. | RUHS | √ | - | - | - |
| 7. | AIMS & RC | - | √ | - | - |
| 8. | RNTMC | √ | - | - | - |

**TABLE NO: 4.4 STATISTICAL ANALYSIS OF STAGE OF RE-ENGINEERING IN MEDICAL COLLEGE LIBRARY**

| S.No. | Stage of Re-Engineering | Frequency out of 08 College | Percentage |
|---|---|---|---|
| 1. | Planning Stage | 5 | 62.5 |
| 2. | Applied Some Ideas | 2 | 25.0 |
| 3. | Modified Major Operations | 1 | 12.5 |
| 4. | Fully Changed | 0 | 0 |
| | **Total** | **8** | **100** |

**TABLE No. 5 MODERN SYSTEM OF COMMUNICATION EFFICIENCY OF ACQUISITION**

| S.No. | College Code | Yes | NO |
|---|---|---|---|
| 1. | JNMC | Yes | - |
| 2. | SPMC | Yes | - |
| 3. | SMC | Yes | - |
| 4. | AIIMS | Yes | - |
| 5. | MGMC | Yes | - |
| 6. | RUHS | Yes | - |
| 7. | AIMS & RC | Yes | - |
| 8. | RNTMC | Yes | - |

## SUGGESTIONS

1. Libraries staff needs an ideal opportunity to time legitimate hand on tanning and valuable chance to perform themselves. These days in library science, we observe that from different streams like Computer Science or BCA or MCA (specialized individuals) are including, so it is happing because of absence of ICT information on Library Science and Information staffs.The librarian needs proper automation in their libraries due to higher authorities are not allowing them.
2. It is recommended that each clinical school library needs rapid web network.
3. It is recommended that private clinical school libraries should expand the consortia administrations, they have not many consortia, however it isn't sufficient.
4. It is proposed that e-assets, advanced storehouse, tanning program should set up for UG, PG, Research Scholar, and specialists, and so forth
5. The Information Communication Technology-based administrations can be financed towards information sharing. Entomb Library Loan administrations are fundamental to be acquainted with the exploration networks in the clinical school library.

## CONCLUSION

In the space of schooling, the Health care Library involves a particular spot. The change is required, and the Libraries know about it. Data innovation develops, and its application should be utilized to modify the space for reuse. Libraries presently

approach data and have advanced into Digital Libraries and Virtual Libraries in new instructive arrangements. Libraries show Google and other web crawlers essential experiences. Presently the time has come to find out about and alter the advanced library. Would we be able to change our administrations to make them more adaptable and open? These libraries will be updated with better and further developed innovations.

The significance of re-designing is a basic part of current library framework improvement, organization, the board, and administrations. It is pivotal for the eventual fate of libraries and the foundation of a genuine library without dividers. It presents new techniques for data taking care of, as well as huge changes to the main design of data and its correspondence.

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# College Libraries as facilitators of academic development: A case study of Government First Grade College Library, Gundlupet

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**Abstract:**

*This study focused on the role of Government First Grade College Library in the academic development of the College. A method of research design was used whereby copies of questionnaires and structured interview to collect data. The study was conducted among 180 library users (students, faculty and College staff), librarian and another member of academic council as two key informants. The study found that the Government First Grade College Library is playing an important role in the academic development in terms of education. The library offers information literacy training, free Internet access and library services for e-resources for all users. The study also found that Government First Grade College Library plays a significant role in contributing to teaching and learning by providing reference services and circulation of books, journals, magazines and newspapers. The study identified the challenges that the College library to include: lack of relevant resources, insufficient ICT facilities and absence of enough reading space for users.*

**Key words:** College libraries, academic development, Government First Grade College Library, Gundlupet, Chamarajanagara.

## INTRODUCTION

Academic means relating to schools, colleges, and institutions, or connected with studying and thinking. Academic development mainly refers to the development of teaching-learning environment of a College. So, academic development is the advancement of academic environment which is badly needed for academic success. Library is regarded as a central part of a College. College libraries help in many important ways to achieve the missions of the colleges of which they are a part. They are active partners in teaching and support students and faculty through the provision of information resources and technology, spaces for individual and group work and study, programs and events, and support with finding, using, and assessing

information. Their contribution is replicated in academic development within the colleges. According to Khan et al. (2014), in academic institutes academics mostly depend on the library resources and facilities. No doubt a quick and easy access to such resources accelerates academic activities more effectively.

Colleges plays a major role in developing a country. It is an organization of higher education which grants academic degrees in a diversity of subjects. The academic culture of modern colleges is changing with the changing of teaching-learning concepts. In addition, the richness of ICT has brought about a revolutionary change in the global knowledge. As a result, the information needs of students and teachers are growing very high in this age of information era. It affects the library to strengthen its role by implementing suitable sources and services. The works done by the library reveal the goal and success of the College. The library influence is very important for building the organization reputation. As an indispensable tool of College, the library which does not show the ability to play effective role will lose its position in the academy. Consequently, College will fail to secure position in the society or in the ranking. It will also infect the development process of the country.

In recent years, many changes have been brought by technology to the rapidly expanding information universe. Changes in technology have created an increasingly complex environment. As a result of changes in scholarly communication and technology, College libraries are experiencing many challenges to fulfil the constantly growing demand of users. Government First Grade College Library is also facing some problems of technology, resource, space and personnel that the author has already witnessed through working in the library. The improves in technology also provide both challenges & opportunities as academic libraries work to successfully contribute to their organization's task. Therefore, this study was considered to examine the current role of library in facilitating the development of academic standard in College.

Evaluation of the quality of library services can be done by getting feedback from users as they are the best judges toquality. It also assistances to indicate the performance of the services providing for the library users. The role of a College library is obviously to meet the information needs of its community. If we look at the functioning of a College in the developed world, they manage to provide their clients with local and remote access to collections in all kinds of formats. The College library collections here have been based mainly on books and then serial publications like newspapers, magazines and journals etc. The Government First Grade College Library has been taken as a sample for this study which will pave the way for further research. In the year 2007, the Government First Grade

CollegeLibrary was established, and the library started its activities with the aim of bringing library and information services closer to the students, teachers and members of the College family.

**Objectives of the study**

The objectives of the study are to:

1. To identify services offered by the library to the users,

2. To determine the adequacy and satisfaction of library resources and services,

3. To determine the role of the library in academic development as perceived by users,

4. To find out the problems faced by the library.

**FINDINGS AND DISCUSSION**

**Findings from library users**

***User category***

A total of 180 users were consulted. Data on the sex of respondents are indicated in Figure 1 which shows that most of the respondents were males (115); only (65)36% females took part in this survey. The status category (identity ofthe users in the College like students, teachers or College staff) of the users as indicated in Figure 2 also shows that 68% (123) respondents are students, while 22% (39) are teachers. Only 10% (18) fall in the category of College staff.

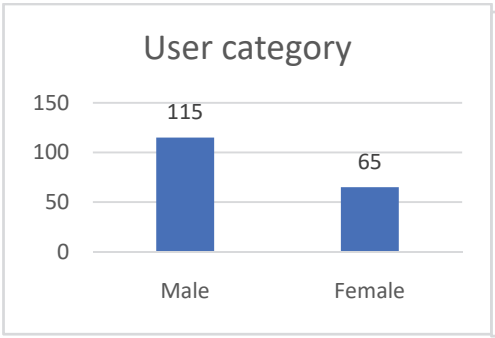



***Figure 1. Sex category***

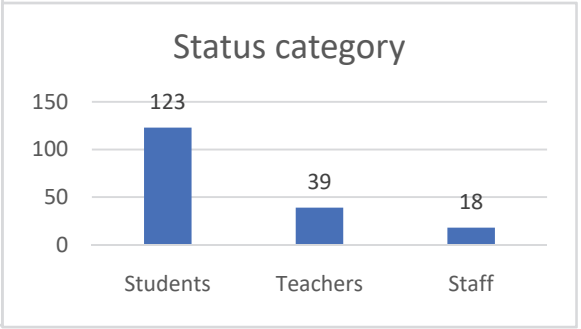



***Figure 2. Status category***

***Library as information centre***

The respondents were asked to satisfy their information needs. Eighty-six (48%)participants indicated that they trust on the internet in order to satisfy their

information needs. While (72) 40% of the participants indicated that the library is their first point of information. Fellow students and teachers were regarded as first point of information by 12% (Figure 3).

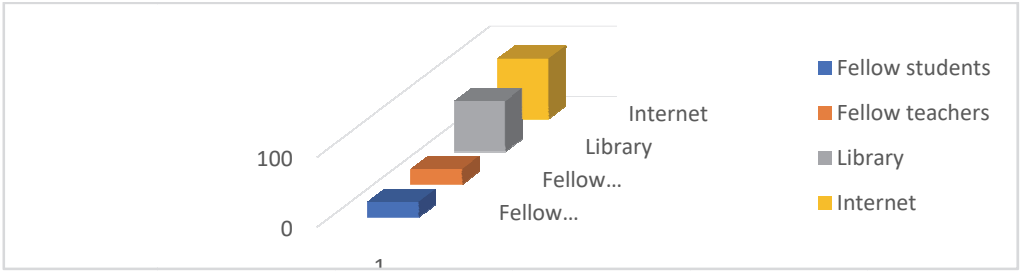



**Figure 3. Library as first point of Information centre**

### *Reasons for visiting the library*

Respondents were demanded to indicate why they go to library, in order to determine what services, they use at library. Figure 4 indicates that (65) 36% of respondents visit the library for studying purposes, (32) 18% to preparing competitive exams, while (69) 38% go to the library to borrow books and only (14)08% of the respondents go to the library for using internet. This is an indication that the library is mostly used forborrow books which also corresponds with the findings on the status of participants, of which students were majority.

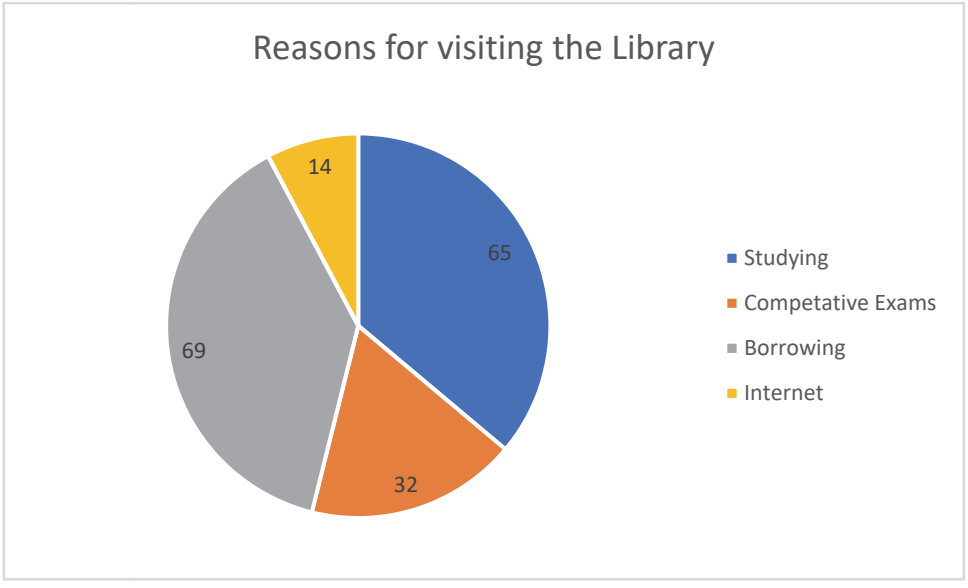



***Figure 4. Reasons for visiting the Library***

### *Adequacy of information resources*

One of the goals of the study was to evaluate the extent to which the different sources of information found in the library are adequate to provide for the information needs of the users of the College. Table 1 shows that 65% of the respondents indicated that the library materials for studying are fairly adequate and only 20% indicated that the materials are adequate to cater for their information needs. 50% of the respondents also indicated that the resources are fairly adequate informationneeds and 40% reflected that the materials are not adequate for research. 50% indicated that materials for reference are adequate, while 30% indicated the reference materials are not adequate. Only 20% of respondent'simpression that reference materials are fairlysatisfactory. The Government First Grade College library resources were overall rated as fairly adequate for studying and research purposes.

| Resources for | Adequate | Fairly adequate | Not adequate |
|---|---|---|---|
| Studying | 36 | 117 | 27 |
| Research | 18 | 90 | 72 |
| Reference | 90 | 36 | 54 |

**Table 1. Adequacy of Information resources.**

| Resources in | Adequate | Fairly adequate | Not adequate |
|---|---|---|---|
| Print | 36 | 126 | 18 |
| Electronic | 90 | 27 | 63 |
| Audio-Visual | 72 | 18 | 90 |

**Table 2.Adequacy of Information resources.**

Users were also asked to indicate the availability of information resources in different formats. Table 2 displays that 70% of the respondents shown that the print materials are equally adequate, while 20% shown that the materials are adequate. Only 10% respondents shown that the print materials are not adequate. 50% of respondents shown that the electronic materials are adequate and 35% respondents

said electronic materials are not adequate, while only 15% indicated that the electronic materials are fairly adequate. 40% respondents specified that the audio-visual materials are adequate, while only 10% indicated that materials in audio-visual forms are fairly adequate.50% indicated that the audio-visual materials are not adequate. Therefore, the print materials were overall rated as fairly adequate. The materials in electronic and audio-visual forms are not fairly adequate but have shortage.

### *Level of satisfaction*

Respondents were added asked to indicate whether they were fulfilled with different services, systems and facilities found in the library. According to Table 3, it was showed that less people were very gratified with different services, systems and facilities found in the library except for opening hours and staff support in which both gained 50% respondents. 36% respondents were not happy with the library collections and 55% respondents were also not satisfied with the state of shelves and arrangements of books as well as library rules and regulations. 65% of the respondents were equally not satisfied with computer and internet facilities. However, 50% of respondents were satisfied with library services while 55% are satisfied with reading facilities and atmosphere. The respondents were asked to give reasons for their choice in Tables 1, 2 and 3 above; some impression that reference resources are not sufficient in the library. There are not enough e-resources. There is also anabsence of audio-visual materials, ICTs.

| Particulars | Very satisfied | Satisfied | Not satisfied |
|---|---|---|---|
| Library collections and resources | 54 | 61 | 65 |
| State of shelves and arrangements of books | 36 | 45 | 99 |
| Staff assistance | 90 | 63 | 27 |
| Library services | 36 | 90 | 54 |
| Computer and Internet | 27 | 36 | 117 |
| Rules and systems of the library | 32 | 49 | 99 |
| Library opening hours | 90 | 72 | 18 |
| Reading facilities and environment | 36 | 99 | 45 |

**Table 3. Level of satisfaction**

As indicated in Figure 4, 35% respondents feel that the reading rooms are very small and sometimes are not available for users. The issue of space was alsoconfirmed by the librarian who specified that the library space is very insufficient. Though it has a separate building, many of its space are now used as academic class room and so it cannot cater for the number of users. The librarian also indicated that, although there is a teacher's reading room in Government First Grade College Library, it is mostly used for other purposes due to the limited space. The issue of space is also making it problematic for the library staff to expand their collections and facilities. 25% of users indicated that there are not enough significant e-resources. 20% of users also showed that reference resources are not sufficient, while 25% respondents also claimed that the internet is very slow and in most cases off. This was confirmed by the librarian, that they have a less bandwidth, that's why the internet is very veryslow in most instances.15% of respondents showed that the library has poor ICT infrastructure, while 10% of respondents showed that the library has no air-condition and digital library service is incompletely provided.

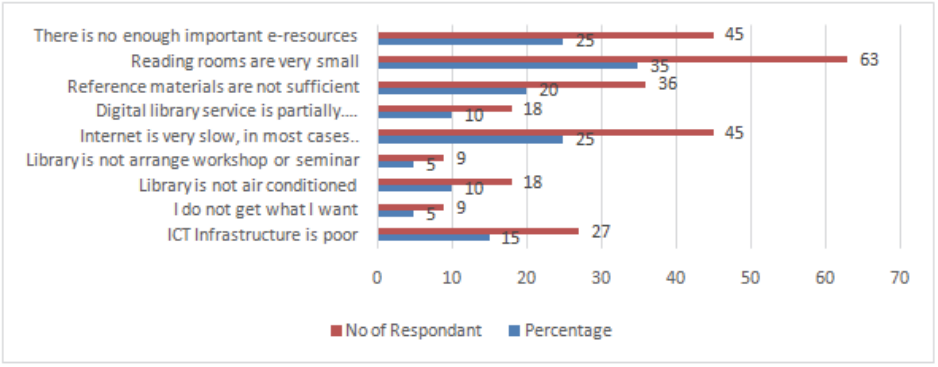



**Figure 4. Level of satisfaction obtained from the library**

***Role of the library involvement to the academic development***

Respondents were added asked to specify what role the library is playing in the College and how it is contributing to the academic development. The uniqueness issues around the use of library replicate the role of the library for individuals in which respondents recognized the support in education as the key role the library is playing in the College. Students and faculty of the College requirement teaching – learning aids in their study and research. The Government First Grade College Library provide necessary support and information for them. In addition, they are

also getting directions to be information knowledgeable through information literacy training provided by the library.

**Findings from key informants**

Interviews were conducted with the key informants (librarian and one academic councilmember) of the Government First Grade College Library to find the library services.

In identification of library services, both librarian and academic council member identify the following services as the main services providing by Government First Grade College Library:

1) Circulation service.

2) Reference service.

3) Print collections (Newspaper, Journal, Magazine).

4) Reprography service.

5) Internet service.

They were also questioned about the relationship between the library and the user's community in certifying that, resources provided meet the information requirements of the users. Despite the absence of relevant resources for students as indicated by users, the librarian reflected that he asks his users to show the kind of materials they want the library to provide. He however elevated a worry that due to a lack of space he cannot add more resources.

Key informants were also questioned about the role of the library and how the library contributes to the academic development of the College. The librarian indicated that the library tries to provide necessary support for quality education and research that the users need in order to cope with the fast-changing world. The library contributes to academic development by providing reading materials and information in education and research. Internet facilities of the library also help the students and faculty to navigate the ocean of information.

**Benefits or significance of the study**

The findings from the case study provide information on how a College library by emerging itself can contribute in the academic development. It is predictable that the findings gained from this investigation will benefit to take necessary actions to improve the Government First Grade College Library as well as the academic standard of the College, and inspire further research in this area.

Identification of the role of a specific library may be useful for other libraries planning the stratagem of development. The study will also benefit people to know the problems or complications of the College libraries. Although there are a number of studies regarding this, this is the first one of its kind in Gundlupet, Chamarajanagara.

## Conclusion

The object of this study is to determine the role of Government First Grade College Library in the academic development of this College. The findings showed that the library mainly has educational role through the provision of circulating information and reading materials to the College. The library also has a role to play in enhancing the library usages and information access through internet facilities and information literacy training provided by the library. However, there are challenges of too few e-resources and ICTs that users feel need to be addressed. There is also a challenge of lack of skilled manpower and inadequate reading space for the users that the library management needs to look into. Although the library is seen as essential to students and teachers, it needs to engage with the users to raise the awareness of the library facilities and services. Besides, the facility of information, librarian needs to make partnership with discipline faculties to form integrated information literacy program as well as digital literacy. This study affords information to start a discussion with stakeholders about the role of the library in the academy and its potential for ensuring academic development and sustainability of College library services.

Based on the conclusions the author made the following recommendations:

1. The library requirements to employ more qualified staff members to be able to carry out the activities of the library, including outreach programs.

2. Provide more ICTs, as the existing devices are not enough to furnish for everyone, because the library is used by everyone of the College.

3. More space needs to be created as the existing space is not enough to accommodate all events taking place.

4. To carry-out outreach program by taking their facilities to users, marketing the library services as well as rising more awareness about the importance of the library.

5. More UpToDate and applicable sources of information to produce for all users, particularly for students and teachers of the College.

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# Relevance of Environmental Sustainability Practices in Libraries of Indian Educational Institutions During pandemic: A comparative study

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## Abstract

*The objective of this study to Understanding the impact of sustainability, an attempt the two renowned Higher Educational Institutions in one of the states in India, Uttar Pradesh. This comparative study has conducted among the two central universities, as, Banaras Hindu University, Varanasiand Baba sahib Bhimrao Ambedkar University, Lucknow.*

*The purpose of this study to identify their sustainable strategies towards the Green Library, to recognize the Green Library perception in Library Professionals, trying to explain the approaches that are taken by the libraries of the selected central*

*universities to make them Environment friendly, and to examine the various challenges faced by them for the conversion of a sustainable library. This study has beneficial for humane welfare as well as to the environment. In this study, the survey method and questionnaire as a tool for data collection will be used. The collected data will be interpreted and analyzed with the help of an MS- excel sheet and MS-word.*

***Keywords-****Sustainable development, Sustainable development goal, Green library, environmental protection.*

# INTRODUCTION

Green is a very popular word now days it is seen everywhere and every field. The concept is really worried about the environment and its abuses; as we want to be green in order to save the environment. "Green" is the least negative effect on the natural environment and maximizes the efficiency of the indoor environment by careful selection of locations, the use of natural building materials and resource management and responsible waste disposal. This paper tries to know about the relevance of environmental sustainability practice in libraries of Indian Educational Institutions.

# Standards of Green library

## Leadership in Energy and Environmental Design (LEED)

Leadership in Energy and Environmental Design is a ranking system developed by the Green Building Council of the United States.

It is non- profit organization and conducted ecological oriented building certification program by which it judge the building's sustainability and then certify by rating such as Silver, Gold or platinum. Site Location, Water Conservation, Energy Efficiency, Material and Resources, Indoor air quality, Innovation and design process six major components depending on them.

## Indian Green Building Councils (IGBC)

Indian green building council founded by a confederation of Indian Industry (CII) in 2001and the vision is to making up a sustainable built environment for everywhere.

# Objectives:

- To know about the impact of sustainability in the BBAU and BHU central University libraries of Uttar Pradesh.
- Identifying the green library awareness in library professionals.
- To investigate the obstacles of a sustainable library transformation.

## Research Methodology:

Survey method used in the study and questionnaire tools has been used in data collection, questionnaire has been created with help of IFLA green library checklist.

## Scope and Limitations:

The Study explores the two famous Central University libraries Babasaheb Bhimrao Ambedkar University and Banaras Hindu University, Uttar Pradesh, India, and confined to library Professionals of Central University libraries of Uttar Pradesh.

**Table1: Name of Central University Libraries, Uttar Pradesh, India**

| S. No. | Name of University | Name of Libraries |
|---|---|---|
| 1 | Babasaheb Bhimrao Ambedkar University | Gautam Buddha Central Library |
| 2 | Banaras Hindu University | Sayaji Rao Gaekwad Central Library |

**Significance of the Study:**

The purpose of this research is to understand about the effectiveness of the Green Library at the Library of Central University. Babasaheb Bhimrao Ambedkar University and Banaras Hindu University, because university libraries are the platform of spreading knowledge, in the case of green initiatives this platform encouraged library Professionals and their readers. Green library is very useful or University as well as the environment.

## Data Analysis and Interpretation:

Data collected with the help of structured questionnaire and taken from librarian of BBAU and BHU Central University libraries.

## Acceptance Level of Plastic in Libraries

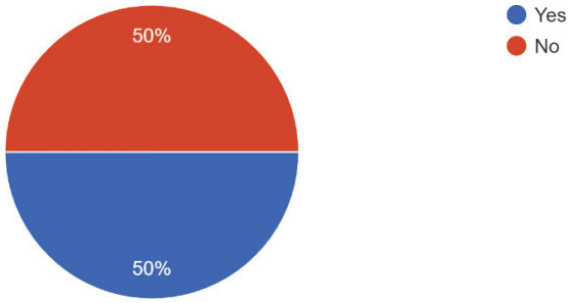



**Figure.1.Acceptance level of plastic in libraries**

Figure. 1. shows that plastic is not accepted in the Gautam Buddha central library building, whereas in Sayaji Rao Gaekwad Central Library (BHU) Plastic is acceptable. And we knows that plastic is non-biodegradable material and it is harmful for the environment as well as human life. So removal of plastic in the library building, initiative has taken by BBAU central library.

## Acceptance level of Green Initiative in libraries

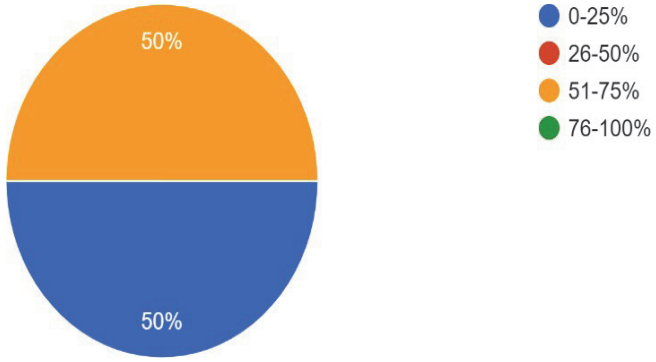



**Figure 2: Adoption level of Green Initiatives**

Figure.2. shows that Gautam Buddha Central library has adopted (51- 75%) Green Initiatives where as Sayaji Rao Gaekwad Central library adopted least (0-25%).

## Form of electrical lighting

Figure.3. explained that both University libraries are using LED light and Compact light in the library building, which is helpful for electricity saving

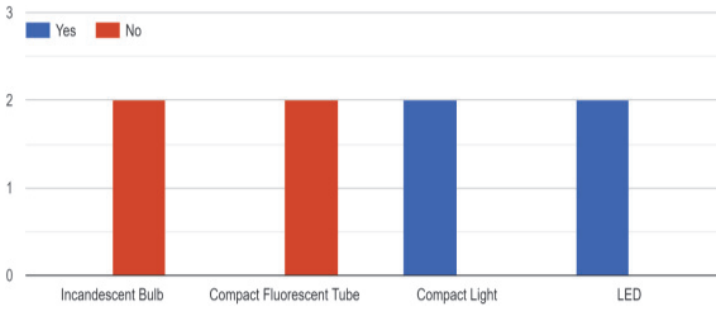



**Figure 3: Source of Electric lighting**

## Cleaning Material for Cleaning Maintenance

Figure.4. reveals that BBAU and BHU Central library both are using natural house cleaning materials for cleaning building.

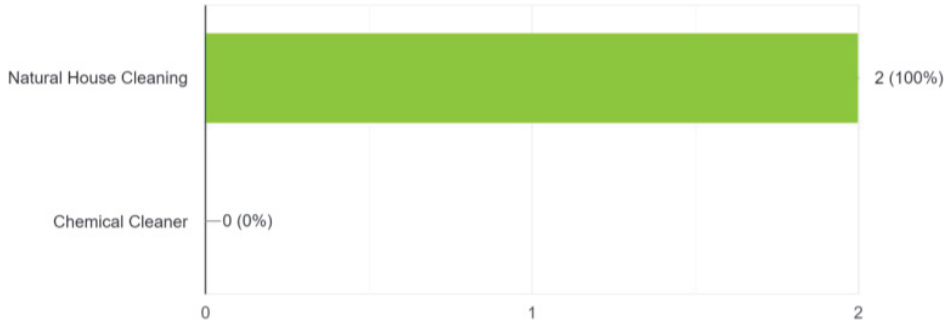



**Figure 4: Cleaning Material for Cleaning Maintenance**

# Table1: Facing Challenges for Transforming Green Libraries

| s. no. | **Challenges** | **Opinion** | **Name of the University** | |
|---|---|---|---|---|
| | | | Gautam Buddha Central Library **(BBAU)** | Sayaji Rao Gaekwad Central Library **(BHU)** |
| 1. | Unexceptional fund | Very satisfied | | ✓ |
| | | Quite satisfied | | |
| | | Neutral | ✓ | |
| | | Dissatisfied | | |
| 2. | Readers' Reckless Actions | Very satisfied | | ✓ |
| | | Quite satisfied | | |
| | | Neutral | ✓ | |
| | | Dissatisfied | | |
| 3. | Irresponsibility of staff at the library | Very satisfied | | |
| | | Quite satisfied | | |
| | | Neutral | ✓ | |
| | | Dissatisfied | | ✓ |
| 4. | Lack of skilled personnel | Very satisfied | | |
| | | Quite satisfied | | |
| | | Neutral | ✓ | |
| | | Dissatisfied | | ✓ |

| | | | | |
|---|---|---|---|---|
| 5. | Environmental Consciousness Guideline | Very satisfied | | ✓ |
| | | Quite satisfied | | |
| | | Neutral | ✓ | |
| | | Dissatisfied | | |
| 6. | Organization attitude | Very satisfied | | ✓ |
| | | Quite satisfied | | |
| | | Neutral | ✓ | |
| | | Dissatisfied | | |

Above Table reveals that library Professional of Gautam Buddha Central library (BBAU) responding Neutral whereas BHU Professional is strongly satisfied with Unexceptional fund /adequate budget, Sayaji Rao Gaekwad Central Library (BHU) professional are responding strongly agree for irresponsible behavior of readers and BBAU library Professional is Neutral for readers behavior, (BHU) library professional are strongly agree and saying yes, they facing all challenges like (Negligence of library staff, Shortage of trained staff, Guideline on environmental awareness, Behavior of organization) for transforming green Initiatives in libraries whereas Gautam Buddha Central library professional are facing challenges but Neutral it is doing practice for transforming Library to Green Library.

## Result

In the above study found that the Gautam Buddha Central Library (BBAU) Profession, staff and their readers are strongly known about Green Initiatives comparison to Sayaji Rao Gaekwad Central Library (BHU), To a large extent, the library of BBAU has adopted a green initiatives, however library are doing more practice to for achieving fully green as well sustainable library.

## Conclusion

After analyzing the above tables, it is concluded that the Gautam Buddha Central Library (BBAU) has developed green library sustainability as compared to SayajiRao Gaekwad Central Library (BHU) whereas BHU central library is still in the first stage of setting up Green library on the another side we seen that BBAU

central library is creating a green image through the use of sustainable strategies. As we all professionals known that Global warming, which has direct impacts on the global climate, is strongly connected to environmental sustainability. Thus, the practice of a green environment in libraries could minimize global warming and green house.

# Westberry School library services during COVID 19: a study

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**Abstract:**

*Today's widespread usage of ICTs, along with COVID-19's worldwide crisis, necessitates the employment of e-learning as a teaching approach. Due to pandemic, the education industry has taken advantage of on it by mandating online instruction in the place conventional classroom instruction. The virus's unanticipated proliferation forced library staffs to devise new methods of functioning quickly, such as converting to digital platforms whenever feasible and offering suitable online services to the patrons. Severaldifficulties exist, including a lack inadequate infrastructure as well as training at either the teacher and learner levels, and a mass education system that appears to be failing to leverage sociocultural diversity and industry recognition in order to adopt a group of learners who are more self sufficient and demand greater operational autonomy. It is a challenge for instructors because it necessitates a change away from traditional pedagogical tools toward virtual ones that are more learner-centric. Many school library class hours and services have also transitioned from physical to virtual modes. The epidemic of COVID-19 has compelled substantial adjustments in the life of libraries and service providers. The majority of the students restricted to stay at their residents, and the physical visit to the school or library has temporarily stopped, but their desire to satisfy their thirst for knowledge will never die. The present paper explores the open electronic resources used and their impact during the COVID pandemic by Westberry school library patrons in Tenali, Andhra Pradesh*.

**Keywords:** *Open Electronic Resources, School Library Services, COVID Pandemic.*

## Introduction:

The length of COVID 19 shown once again that learning knows no borders in terms of age, identity, region, class, material, or tool. Anyone may learn anything from anyone, anywhere, at any time, and using whatever technique they want. A youngster of growing years need the use of books and libraries. It enhances their reading experiences while also helping them to build their abilities as independent learners. In order to teach kids to the knowledge skills that should be exercised throughout their primary schooling, age-appropriate tactics should be used.

Students who participate in a well-planned library programme, activities, and get appropriate evaluations become lifelong learners. It is the era of virtual learning, which necessitates the development of several fundamental conditions that are still lacking even after the information technology revolution. Staff training, a range of online courses and publications, and other infrastructure at the institutional and individual levels are examples of what is available. This preparation is necessary in order to make the transition from traditional to e-learning modalities as smoothly as possible. The worldwide pandemic had a case-increasing influence on the economy, business, politics, and society, and the full extent of its impact has not yet been expressed and cannot be foreseen with certainty since the problem has not yet been resolved in its entirety.

The use of information and communications technology (ICT) in teaching and learning has become mandatory, but owing to infrastructural constraints, all states and all institutions, from elementary schools to higher education, have been unable to implement a technology-based education system. However, the outbreak of COVID-19 has compelled the employment using E-Learning approaches for both teachers and students, something they were most likely not prepared to do before the epidemic. It might have been a huge success if it had been carried out with thorough teacher and learner training. In the Economic Survey 2021-22, researchers discovered that students of all ages in rural regions shifted from private to public schools during the epidemic, while also noting that it is impossible to assess the real-time effect of repeated lockdowns on the education sector. At the announcement of the 2020-21 fiscal year budget, the government presented a new education strategy, which demonstrated the critical role that online education plays in influencing of students.

**Definition:**

The term "open educational resources" (OER) was coined during UNESCO's 2002 conference on the impact of open courseware for higher education in developing countries, which was financed by the Hewlett Foundation.OER has a form of collaboration that can connect people and institutions all across the world. It is a great way for content creators (teachers) to create and share their knowledge with information seekers (learners/students) globally.

**Creative Commons** defines (OER) as teaching, learning, and research materials that are either (a) in the public domain or (b) licensed in a manner that provides everyone with "free and perpetual engagement in the **5R characters**– Retaining, Remixing, Revising, Reusing, and Redistributing the resources."

**Retaining:** Making, owning, and controlling a duplicate of the resources

**Remixing:** Make a public presentation of the resource's original, revised, or remixed edition.

**Revising:** Editing, adapting, and modifying the copy of the material are all examples of revising.

**Reusing:** refers to the process of merging the original or modified copy with other existing material to create something new and distinctive.

**Redistributing:** Make available to others copies of the resource's original, updated, or remixed edition.

As defined by the **Organization for Economic Cooperation and Development** (OECD), open educational resources (OER) are "digitized materials made freely and publicly available for use and reuse in the context of teaching, learning, and research" by educators and students as well as self-learners. "Open educational resources (OER) comprise instructional material, software tools for developing, using, and distributing information, and implementation resources such as open licences,".

The **Commonwealth of Learning (COL)**defined open educational resources (OER) as "materials that are freely and publicly available for use and adaptation in teaching, learning, development, and research".

**About West Berry School Library:**

**Collection:** West Berry School Library has been built amidst a sylvan environment with plenty of natural sunshine and fresh air cross ventilation and a 45-member seating capacity. The library's collection includes over 6,500 books and 45 periodicals, and newspapers. The library has fiction and nonfiction, educational CDs/DVDs, and general multimedia with tablets. In order to encourage students to make full use of library resources, libraries host a variety of annual contests and events.

**Opening Hours:** The library is open from 8:45 am until 4:10 pm on school days. Due to COVID 19, only a few services are provided to the patrons, keeping in mind the local health authority guidelines and school management instructions. Library periods are scheduled as per the school timetable, and students in grades I through XII may visit the library to consult the library's collection (books, periodicals, and so on), to borrow books, and to access e-resources during these times. During this time, students are welcome to engage in library activities.

**Organization:** The fundamental profession of the librarian is to manage the library collection, catalogue the resources, and manage their circulation, as well as other

library processes. The library serves under an open access policy. The books have been categorized and arranged on the appropriate shelves. The print periodicals are arranged in alphabetical order. Children's periodicals (e.g., Champak, Tinkle, Magic Pot, etc.), and children's newspapers are kept on an open shelf in the primary block. These are accessible to all students. They have to place the holdings back on the shelf after reading. Old magazines should be replaced periodically with new ones.

**Facilities:** drinking water facilities, restrooms, a first aid box, and a suggestion box are facilitated near the library building. Two computers are facilitated in the library to access the e-resources, which are open access resources in the library.

**Library Services during COVID:**

West Berry School Library staffs strictly followed the COVID 19 percussions and the returned books are kept in a separate isolation box for 48 hours. Then sanitizing the books carefully. Wearing the mask/face shield and regularly cleaning the hands throughout the day, maintaining the social distancing protocols in public places and during interaction with patrons. Any patrons experiencing any COVID symptoms or sickness are discouraged from visiting the school.

**Online Educational Resources (OER)**

Online educational resources often have a close connection with e-learning. E-learning is not only a technology but also a collection of various pedagogies to learn and teach. It can also incorporate OER as a pedagogy that can facilitate quality learning. The main benefit of OER is that it is freely accessible for both students and teachers. Apart from attending the classes online, students can use these OERs to gain more insight into a particular topic. The National Knowledge Commission has suggested an increase in the number of OERs to address this changing trend.

**DIKSHA:**

One platform for school education in India is called DIKSHA. It's called "One Nation, One Digital Platform." The Digital Infrastructure for Knowledge Sharing (DIKSHA) portal and mobile app were made by the Ministry of Education. Itprovides lot of eBooks and e-Contents, as well as learning materials made by States/UTs and other groups at the national level. DIKSHA has the e-Textbooks of NCERT/states and other e-Contents, which are mapped with QR Codes, on it. E-Content can be found in 32 Indian languages. To make DIKSHA easier to use for everyone, NCERT, NROER, and e-Pathshala e-Contents have also been added. This will make it easier for everyone to use.

## E Pathshala:

The Ministry of Education, Government of India has launched the E-Pathshala programme, which aims to provide digital books and e-content to students, instructors, teacher educators, and parents can access and over 696 digital books, 377 e-textbooks (from classes I to XII) and 40.000 videos and audios of NCERT open and free resources in English, Urdu, Hindi, and Sanskrit through the mobile app (Android, iOS, and Windows) and e-Pathshala (https://epathshala.nic.in/) web portal

## National Repository of Open Educational Resources (NROER):

In collaboration with Central Institute of Educational Technology (CIET) and National Council of Educational Research and Training (NCERT), the National Repository of Open Educational Resources (NROER) has been established. On August 13, 2013, the National Resource on Education and Literacy (NROER) was inaugurated in New Delhi in collaboration with the Department of School Education and Literacy, and Ministry of Human Resource Development (MHRD), Government of India. The materials accessible here are licensed under Creative Commons and can be used and adapted freely with a reasonable number of citations and links, including where they are formed. One can also add to the knowledge and become a knowledge creator. NROER contains a huge number of educational resources in a variety of disciplines and several Indian languages for elementary, secondary, and senior school students. Resources are accessible in a variety of media, including video, photos, audio, papers, and interactives, among other things.

## MAHADNYAN:

An eLearning website dedicated to expanding access to and usage of high-quality open education materials. The Maharashtra government partnered with the HomiBhabha Centre for Science Education (HBCSE), Tata Institute of Fundamental Research(TIFR) Maharashtra Knowledge Corporation Limited (MKCL), Knowledge Foundation, and India Consortium for Educational Transformation (I-CONSENT)to promote this effort. The RGSTC (Rajiv Gandhi Science and Technology Commission) is supporting the initiative financially. The following initiatives have been implemented:

**Virtual School and Learning Homes:** is a pilot research initiative in Maharashtra that provides open and distance learning to out-of-school children.

**OER (Open Educational Resources):** are freely accessible online learning tools for educators.

**NETS** (Nurturing Excellence and Talent Services) is a teacher-training programme that teaches instructors how to discover and nurture talent in students using a variety of tools and strategies.

**eTeacher training:** is a self-paced audio programme that equips teachers with knowledge and abilities in information and communication technologies (ICT), open and remote learning as well as growth, and the utilisation of learning programs.

**NTPEL:**

The National Technology and Professional Education Laboratory (NTPEL) is a collaborative endeavour of all IITs (Indian Institutes of Technology) and the IISc(Indian Institute of Science) funded by the MHRD (Ministry of Human Resource Development) in an attempt to improve the quality of higher education in India. The NTPEL provides a variety of engineering, science, and humanities courses through video lectures.

**Ekalavya project:**

The Indian Institute of Technology, Bombay, has initiated the Ekalavya project. It is the goal of this project to generate material in several Indian languages that will be delivered on the internet in order to teach high-quality engineering principles to students. The majority of the funding for this initiative comes from private sector. One of the main outcomes of this project was the creation of OSCAR (Open Source Educational Resources Animation Repository), a web-based repository of dynamic animation that can be used to educate about various concepts and technologies. The OSCAR platform is for animators, mentors, and professors to work together on animated projects. It allows animators, developers, and students to work together on animated projects.

**eBasta:**

It is part of the government's "Digital India" project. As a result of this project, a framework has been developed to make school texts available in digital form as e-books that can be browsed and used on tablets and laptops. Publishers may make their materials available for use by schools by putting them on the site. These bases are then made available to students through a web portal. The eBasta App, which can be downloaded through the site, is compatible with any Android tablet. It can get to the eBasta that was made through the portal, making it easier for students to find.

**English Grammar:**

It covers every part of the English writing system, so you can improve your writing skills in both personal and professional situations. Whether you're looking to learn the fundamentals, such as the meaning of verbs and nouns, and how to correctly use an apostrophe, or you want to learn more complicated subjects, such as syntax optimization, conjunctions, and creative writing approaches, this book will help you every step of the way.

**TESS INDIA**

The TESS-India programme is being directed by The Open University in the United Kingdom and is being sponsored by UK grant funding. It is devoted to the enhancement of the quality of teachers' education in India. The initiative, which began in November 2012, concentrates on the professional development of professional educators and teachers in the participating states. There are 105 courses for secondary and post-secondary classroom teachers (teacher development OER) in the TESS-India Open Educational Resources (OER) and 20 modules for school administrators. The OER is offered in a variety of languages and cultural situations. It strives to promote learner-centered practises, including, participative, engaged, and efficient classroom pedagogy, in order to impact students' growth and accomplishment through high-quality education.

**Westberry School Library Services and activities:**

The following library activities are conducted based on the online as well as offline conditions during the COVID pandemic.

**Train activity:** Library activities help patrons learn how to use books, engage with resources, and help them to learn as they wish. As part of library orientation, the librarian introduces this activity to show the various types of books and their location in the library to all the students, involving a group of students. Here, students get an overall knowledge of the library collection and its sections.

**Digital story telling:** To connect the library activities and services with the student's librarian, start storytelling from the selected books. This service increases the listening, interacting, critical thinking, and building of visualisation skills among the students.

**Dictionary skills:** Animportant and innovative skill for each student.

To learn new words with their meanings

To identify the words alphabetically with their examples.

To know the synonyms for the words

To create a vocabulary and its phonetic transcription

**Exhibitions and Displays:** Conduct exhibitions and displays of books and other library materials in connection with important days or events (e.g., Independence Day, Republic Day, Gandhi Jayanthi, Science Week, Language Week). The result of this event shows the students the great personalities, freedom fighters' lifestyles and their service to our nation, important days' activities and makes reading about them much more interesting to the students.

**Newspaper reading/Crossword:** Students are given a task to read newspapers, find the difficult words, underline the words, and inform the library. The librarian will write the word on the board with the word's meaning. It helps to improve the vocabulary skills of the students. In the Crossword activity, the librarian explained the ways to solve the crossword puzzle. The librarian explains the meaning of the clues given under the across and down titles. It is very helpful for students to improve their verbal skills and stress management skills. Students participate in discussions with teamwork and enjoy finding the answers to puzzles.

**Reading aloud:** The act of reading aloud provides the basis for the development of literacy skills. It helps kids enhance their reading and speaking abilities, and it also motivates them to recite poetry or tales aloud in class. Assisting pupils in comprehending what they have read. Listening to others read helps them gain important knowledge and abilities. Students must be exposed to a diverse variety of tales and literature in order to have a better understanding of today's world.

**Fiction reading day:** In this activity librarian will prove to students on various topics (Focus on a special topic) in Hindi, English language. Students read the selected topic aloud, one by one. They were acquainted with various characters in the story. Teachers and librarians explain the steps involved in the creation, and they evaluate the students' performance.

**General Knowledge / Quiz activity:** It creates an awareness activity it helps to improve the overall knowledge to the students on a specific topic.Apart from this, organised based on the full forms of important acronyms discussed with students. It helps to improve the overall knowledge and motivates students to prepare for competitive exams.

**First Aid Club:** In this activity, the librarian created awareness of the various types of seasonal diseases, viruses, an injured person, and immediate care given before

going to the doctor. In the library, they set up a first aid box with up-to-date medical items. Explained the usage and importance of the first aid box. It helps students learn to care for themselves in any kind of emergency. As a part of the first aid club, the librarian conducted a talk on the Corona Virus and the current health issues all over the world. They explained the origin of the virus, how it spreads, its symptoms, precautions, how to protect mental health stress during COVID, etc. It is our responsibility to make libraries part of the solution.

**Book Talks:** Book talks are traditionally thought of as a tool used by librarians and teachers during library class hours. When it comes to reading, book talks in libraries have shown that classroom instructors and librarians have different priorities, indicating that they should collaborate more effectively. Librarians were involved and were found to have focused primarily on the pleasure of reading with students.

**Yoga Day:** On the occasion of Yoga Day, the library organised a book display on Yoga and Meditation. A talk was conducted on the amazing benefits of yoga and meditation in helping to improve our health and mind. Explained the role of yoga and meditation in our day-to-day life.

Apart from the all above activities library planned to conduct activities on Table Manners, Importance National Day, National Science Day, Freedom fighter's life story, Motor Vehicle Act, Road Safety Rules, About ISRO and its activities, Post office and its functions, Banking information, etc.

## Conclusion:

Due to the COVID-19 epidemic, the distribution of library and information services changed dramatically. Majority of the parents were involved in their children's schooling activities. School librarian guided to parents as well as students to retrieve the required information from Open access resources. By teaching and guiding the parents and family members, indirectly librarians are educating the students. The utilization of ICTs (information and communication technologies) and web technologies has created an unprecedented environment for enhancing and supporting teaching and learning activities. In India, many educational institutions are still struggling to build an IT infrastructure to render effective services. The use of library spaces, infrastructure, and new technology is a universal method that may assist in meeting the present problem and ensuring that the libraries continue to operate without interruption. It has seen both instances of outstanding ingenuity and resiliency on the part of librarians and information professionals, as well as how many people lost personal services, among other things.

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# Mobile Information Service and Technologies in Libraries

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## Abstract

*The mobile landscape has expanded substantially, and libraries are now experimenting and researching this technology as well. The current study looks at some of the most innovative library methods for delivering services via mobile devices. It also provides an overview of current trends in mobile tools and applications for libraries, such as internet mobile, mobile multimedia, and SMS / text messaging, as well as descriptions of the various activities these devices support for library use, with a focus on how libraries and librarians are responding with services tailored for these devices and what libraries can do in the future in this regard. The study goes on to look into how mobile phone services are used in the academic setting.*

*Libraries have always led the way when it comes to experimenting with new technology, whether it's automation or embracing other information and communication technologies to better their services. This paper provides an overview of how developments in mobile telecommunication systems, web technologies internet or intranet, and geographic systems can be used to provide library users with ubiquitous, user friendly, customised, and dynamic up to date information services. Libraries will benefit greatly from this new technology in terms of improving their relationships with existing users and providing a better user experience. Libraries may be able to reach out to remote people who were previously thought unlikely to connect due to a lack of a medium. This should be done in accordance with the parent's information security rules and standards.*

**Keywords:***Mobile Technology,Mobile services, SMS notifications, Mobile Applications*.

## Introduction

Mobile technology created for the purpose of communication. Mobile phones have altered the way we live and work in the last years. In both developed and developing countries, mobile phones have become increasingly important. Mobile

phones are becoming increasingly popular among young people. Engineering students are eager to learn about and apply these technologies. They use their mobile phones to get any information they need. The majority of them use the internet to check their e-mails, and they are all drawn to social networking sites and e-resources via mobile web.Students can utilise mobile phones for quick reference and undertaking thorough study because they are convenient to carry and adaptable. Laptops, netbooks, notebook computers, cell phones, audio players such as M3 players, cameras, and other objects are examples of mobile devices. Almost every college student has a smartphone that connected to the internet. The number of people who own smart phones and use them to access the internet is growing. Mobile phones come with a number of applications that can help students store, receive, and access all of the information they need to continue their studies.

Despite the fact that libraries are facing difficult economic times, librarians across the country and around the world are looking for innovative ways to provide mobile library services. Innovative projects like Dan DeSanto's exploration of mobile, location-based access to the University of Vermont's Long Trail digital collection, described in "The Mobile Future of Place-Based Digital Collections," and Michael Whitchurch's QR Code implementation at Brigham Young University, described in "QR Codes and Library Engagement," connect the mobile user to the physical and virtual collections offered by the library, enhancing the user's experience and expanding their knowledge.

As we communicate via text messaging (SMS), mobile platforms, social media, and location-based services, we're all building best practises for language, design, development, and engagement when it comes to mobile information sharing. Information professionals are putting their professional skills and experience to work reviewing existing options and generating recommendations for peer implementations and enhanced next-generation solutions as they experiment with these technologies.

Successful mobile projects require innovation, teamwork, and experimentation. As mobile technologies advance, we rely on our own experiences as mobile information consumers, our knowledge and expertise as information professionals, and our collaborations with interdisciplinary colleagues to gain insight into mobile culture's norms and necessities, our users' mobile computing needs and expectations, and the emerging vision of the mobile future, as defined by each of us working together at the cutting edge of information technology today.

# Mobile Apps and their Features

| Sl. No | Name of the Mobile App | Usefulness/Feature of Mobile App /Website Address |
|---|---|---|
| 1 | **LibAnywhere** | Search library catalogues, to attend library events, use SDI services. It supports iOS and Android operating systems. (**www.libanywhere.com)** |
| 2 | **Catch** | Preparing notes (text, audio, or video etc.) and save them to 'spaces' in this app and facilitates to share with other users. It gives 70MB of free space per month. (**https://catch.com)** |
| 3 | **Ever Note** | It enables users to prepare, save notes and sync their mobile and desktop devices. This app supports with both Android and Apple iOS Smart phones. (**http://evernote.com)** |
| 4 | **Inspiration Maps** | "Inspiration Maps" is an instructional programme for the iPad, specifically supports Apple iOS mobile phones. We can make mind maps and other useful diagrams with this software **(https://itunes.apple.com/us/app/inspirationmaps/id510173686?mt=8)** |
| 5 | **EasyBib** | This app helps to prepare bibliographies in MLA (Modern Language Association), APA (American Psychological Association), and Chicago styles and also users can scan a barcode of books. (**www.easybib.com)** |
| 7 | **AccessMyLibrary** | Supports an Android and Apple iOS device with login credentials providesGale subscribed Database. **(www.gale.cengage.com/apps/aml/College Library/)** |
| 8 | **ArticleSearch** | Scholarly articles and other academic publications can search by its users **(https://itunes.apple.com/us/app/articlesearch/id401914624?mt=8)** |

| | | |
|---|---|---|
| 9 | **NPTEL Swayam** | Ministry of Human Resource Development (MHRD) launched in 2003 the National Programme on Technology Enhanced Learning (NPTEL). It is a Web-based learning open course with videos in various degree levels for everyone. Currently, there are over 1100 subject video courses available for viewing and downloading on the web platform. **(https://swayam.gov.in/nc_details/NPTEL)** |
| 10 | **NGL Library Mobile App:** | It supports only on android phones for those who are using NGL Library Software. Library users can search and retrieve the library catalogue of a particular library and also they can check their account status. **(https://m.apkpure.com/carbon/org.newgenlib.carbon)** |
| 11 | **British Council Online Library** | It provides access of e-books, e-journals, classical movies, short films, audio books with subscription. **(https://www.britishcouncil.in/library/online-library)** |

## Mobile Technology

Mobile technology, in general, refers to any mobility-related technology, such as that used in the automobile industry, notebook computers, personal digital assistants, smartphones, and cellular phones. Hardware, operating systems, networking, and software make up mobile technology devices. Mobile technology is a sort of communications technology that uses unguided media transmission such as radio waves, infrared, and Bluetooth to send any type of data, including audio, video, text, and photos.

## In LibrariesMobile Technology

The "Libraries in Hand" trend has emerged as a result of mobile technologies. Our librarians are working to figure out how these gadgets affect information access and to make sure they're connecting with patrons and offering web content in the most suitable and effective ways possible. Our librarians must be ready to meet this challenge by expanding the market and demand for mobile access to individualised facts and information on one's own portable device at any time and from anywhere. Because mobile devices are truly personal, search histories and physical locations can be used to provide more accurate, personalised information and services.

Because users don't want to wait for a list of web results, libraries are now adopting many of the mobile industry's technologies, such as PDAs, Blackberries, iPods, cell phones, and UM PCs (Ultra Mobile PCs), to mobilise library content in a portable format suitable for small screens and deliver short services in the form of information with multiple searching features. Librarians will need to learn how to use these devices so that users can access them from anywhere at any time.

Libraries will experiment with mobile devices and services to satisfy their patrons' information requirements wherever they are as the digital revolution progresses. The introduction of mobile technology raises awareness of the traditional interactions between libraries and their users and devices, as well as posing new privacy concerns for readers. Simultaneously, the rise of mobile devices and services presents challenges of information access in the digital age, such as content ownership and licencing, digital rights management, and accessibility.

Today's mobile devices are capable of running increasingly complex software, interacting with cloud services, playing rich multimedia material, and allowing for advanced user interaction. Text messaging, smart phone software apps, mobile websites, global positioning systems (GPS), Wi-Fi, and media creation and capture tools are all part of the mobile environment, as are new hardware and technologies such as Bluetooth, accelerometers, and multi touch screens. Many modern mobile gadgets are increasingly "always on," meaning they are designed to be linked to a wireless network by default.

## TheExpandedServices in Libraries

By embracing the rising potential of mobile technology, libraries may better serve their users. They can advertise and expand their existing services by providing mobile access to their websites and online public access catalogues, as well as mobile reference services, e-books, journals, video, audio books, and multimedia content. As a result, audio/video collections are increasingly being streamed on demand or downloaded, allowing content to circulate in libraries.

## In India the Mobile Learning Development

The latest slogan of Indian libraries is "Libraries in Hand," because mobile services in India are fairly affordable. M Learning is still active in India at the moment. The proliferation of mobile phones, PDAs, and other mobile devices means that the platform has a lot of potential in India, with over two million new users joining every week, and excellent connectivity across regions, according to the Telecom Regulatory Authority of India. As of the end of May 2014, India had 910.16 million mobile phones and 938.34 telecom service (including landlines) users. In India,

major mobile manufacturers such as Nokia, Sony Ericsson, and Motorola have partnered with service providers such as Airtel, Vodafone, and others to offer mobile content, which includes educational content.

Initially, library alert services such as information on new books for suggestion, books on display, arrival on indented document, reserved documents ready for collection, books overdue, library circulars, information about important events, and so on, were provided by allowing users to comment on items in the catalogue and allowing users to comment directly to library databases from their PDAs and mobile phones. QR codes can be used in the ISAC library's online catalogue, web pages, and virtual materials to enable users capture, store, and retrieve information about the library's services and resources.

Students can use any mobile device, not just their desktop computers, to access a wide range of digital resources and library services and truly engage in learning activities. The library is on the cutting edge of new and developing trends in mobile learning and education, thanks to developments in MP3 format, pod pricing, and compatibility for a third generation of smart phones.

**SMS Notifications**

Many libraries employ SMS for a variety of purposes, including item availability notifications, due date reminders, information about library materials availability, phone numbers and locations, and more.

**Type of Mobile Devices Used InLibraries**

*PDAs (Personal Digital Assistants)

* Tablets

* iPods and MP3 players

* Smart Phones

* Mobile Design

* Cell Phones

**Library Apps Developed by Different Libraries and Organizations are**

* National Digital Library

* NPTEL Swayam
* Indian Law Mobile Library
* NCERT

* The GIT Library app
* Library of Congress (LOC)
* Encyclopaedia Britannica Mobile
* WorldCat Mobile etc.
* British Council Digital Library

**Advantages**

* Search library catalogue and view their status

* Login into their account

* Reservations

* New Arrivals

* Request for Checkouts

* My Transactions History

* Limitless access

* User participation

* Location awareness

* Ability to access information

* Providing students with freedom of location and time

* Students have access to campus information

* Increasing space in teaching and learning

* Enabling one-to-one learning based on individual educational histories or test results

* PDAs allow students to access syllabi, assignments, reference books, and other course-related resources more easily and quickly.

* When organising appointments, turning in electronic assignments, and sharing information such as URLs, lecture summaries, and academic requirements, students have direct communication with an instructor in class.

* Enabling teachers to stay current on new educational subjects in preparation for future schooling.

* Mobile makes your content accessible to everyone.

* Smartphones are the wave of the future.

* Your audience is more diverse because of mobile.

* Mobile allows you to communicate with customers in a new way, and it is easier to use.

* There are three times as many mobile phones as personal computers on the planet.

* Mobile allows you to provide new service kinds, such as location-based services.

**Disadvantages**

*Inadequate content

* Expensive

* Inconsistent input and output interface

* Processing power is limited

* When compared to a wired Internet connection and Transmission speed is relatively modest.

**Limitations**

Although mobile technology holds great promise for library services, there are some limitations or barriers to providing library services, such as:

* Digital rights management

* Access to information in the digital age

* Limited memory of mobile devices

* Typically expensive and resource intensive

* Content ownership and licencing

* Reach of an external vendor into digital collections and technologies – sustained access will be an extremely important issue for librarians

* Inadequate mobile-friendly academic content to satisfy the expectations of students. From the library's standpoint, there are issues with identifying and accessing the content that mobile learners require.

The majority of people still think of cell phones as gadgets for making phone calls and sending text messages, so they don't correlate them with other activities like searching for information. People are becoming increasingly reliant on their mobile phones, with a growing minority using them as diaries, note-taking devices, and e-

mail and internet access. As a result, library customers may have a higher expectation that libraries will deliver some services in a mobile-friendly manner.

## Conclusion

In today's world, mobile technology has become an integral part of our daily life. Mobile phones were created largely for the purpose of communication. In both developed and developing countries, mobile phones have become increasingly important. The mobile phone is a gadget that allows users to communicate, interact and innovate using their hands. Mobile gadgets and technologies have the potential to greatly simplify the teaching and learning process. Mobile apps can help students learn by making library resources more accessible, attracting new users to the library through increased access to library resources, and providing a new opportunity for patrons and libraries to engage. The rising use of mobile phones opens up a previously untapped avenue for delivering library materials to users.

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# Initiation of Green Library Project in Bangalore University Library: An Overview

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## Abstract

*The green library or sustainable library is a new concept and it is gaining popularity among the library professionals and encourage the LIS future generation to think about environmental sustainability and libraries, to "go green" in their Library Environment, and to spread the "Green library movement" in their library associations and their countries. The main aim of this paper is to the details of the Initiation of Green Library Project in Bangalore University Library. For this study, we collected information from the University Librarian and the office. The purpose of the study is to know the initiated year of the green library project, the purpose of initiating the green library project, the benefits of users with initiating the green library project, the space and equipment are included in the green library. This study information may assist in initiating the green library project in the state as well as the country.*

**Keywords**: *Green Library, Bangalore University Library, Librarian, Bangalore*

## 1. Introduction

The word '**Green**' has great importance here for a healthy survives. Over the past few years, there are increasing interest in the green revolution in every sector, and the library is one of them. The climate change issue became heavy on dependants, especially people of around world. So to reduce the problem there are many research and developments are going on, many scientists are working on different projects to overcome these issues.The green library movement emerged in the early 1990s and it is gaining popularity in the field of library and information science profession. The library professional also trying to develop such a kind of

library that will minimize electricity consumption, be energy efficient, and be environment friendly.

The Libraries and librarians are directly related to society and their green buildings are giving them great opportunities to educate the citizen. ***The duty of a Librarian is not only to provide information to the users but they should play the role of leader to construct modern Green Buildings to save our natural environment***. The green library or sustainable library is a new concept and it is gaining popularity among the library professionals and encourage the LIS future generation to think about environmental sustainability and libraries, to "go green" in their Library Environment, and to spread the "Green library movement" in their library associations and their countries. For the next generation, library professionals should move beyond environmental sustainability exemplified by various practices of "Greening Libraries" and focus on proactive steps to guarantee the future sustainable development of libraries.

We have international standards like LEED (Leadership in Energy and Environmental Design) certification system and BREEM at the international level. In India, we have GRIHA and IGBC. GRIHA has been adapted by the government of India as the National rating system. Indian Green building Council (IGBC) was established in the year 2001 to promote and rate Green buildings in India. There is some Green library has situated in a different part of the country. There are some green libraries are given below. Anna Centenary Library (2010), Karnataka University Library, PermaKarpo Library (2010) Delhi University Library, etc.

**Bangalore University**

The University of Bangalore is located in Garden City, Bangalore, which is called "I.T. The capital of India," was established in July 1964. The university is structured into six faculties- Arts, Science, Commerce & Management, Education, Law, and Engineering. It has more than 50 Post Graduate Departments. The University has also established the Centre for Gandhian Studies, Dr. B.R. Ambedkar Study and Research Centre, and Centre for Study on Social Exclusion and Inclusive Policy. Bangalore University has completed Fifty-six years of fruitful existence and has come to be hailed as one of Asia's largest universities. Though initially intended to be a federal university, it has eventually emerged as an affiliating University. The University was first accredited in 2002 by NAAC with Five Star Status, re-accredited in 2008, and Nov. 2016 in 2nd and 3rd Cycles with 'A' Grade.

## Bangalore University Library

The University Library was established in the year 1966. The building has 16,000 sqft stack areas for keeping Books, Reference Books, Back volumes of Journals, display of Current Journals, and workspace within the library. The Bangalore University Library has over 4,500 students, with 900 Faculty/Non-Teaching Faculty are getting library services. The library has 3,80,000 lakhs books, 60,000 back volumes,200 periodicals, 60 daily newspapers and magazines, 52,000 e-books, 1.50,000 lakhs e-journals, and e-prints, Prashnantaranga, e-shodhganga, etc. are available for users. Constituent colleges University Visvesvaraya College of Engineering (UVCE), University Law College (ULC), University College of Physical Education (UCPE), and Ramanagara P.G centers are subject to university. Along with the acquisition, technical, circulation, periodical sections, m-library, virtual library resources, UGC Infonetcenter and library software, career information resources center, such Service facilities are provided to the user community. An expanded green library project is in progress.

## Objectives of the Study

The objectives of this paper are as followed

- To know the initiated year of the green library project
- To know the purpose of initiating the green library project
- To know the benefits of users with initiating the green library project
- To know the space and equipment are included in the green library project

## Initiation of Project on 'Green Library' in Bangalore University Library



The role of the library in this worldwide phenomenon is enormous. Libraries are the platform for lifelong learning and provide users with the information and knowledge they need. The concept of '**Go Green**' and **environmental-friendly**, **sustainable information systems, services, and facilities** are slowly attracting the attention of the library officer's effort to initiate the green libraries are on the rise. It is sustainable in advanced libraries where minimize artificial resources and maximize natural/renewable sources such as air-atmosphere, sunlight, water-rivers, forest-land, and inter-connectivity with biodiversity cycle systems are crucial for saving the earth and creating community awareness through users education on environmental education and sustainability.

Green Library Movement which comprises **librarians, libraries**, and college and university campuses committed to greening libraries and reducing eco-degradation. Green libraries are quite popular all over the world. Most of the famous libraries are transforming their library buildings into green environments.

**Initiated the Green Library Project in 2019**

The Bangalore University Library has initiated the "Green Library Project" in August 2019.

The foundation stone for the project was laid by Vice-Chancellor K.R. Venugopal and other officials on 27th August 2019.

**Purpose of Initiating the Green Library Project**

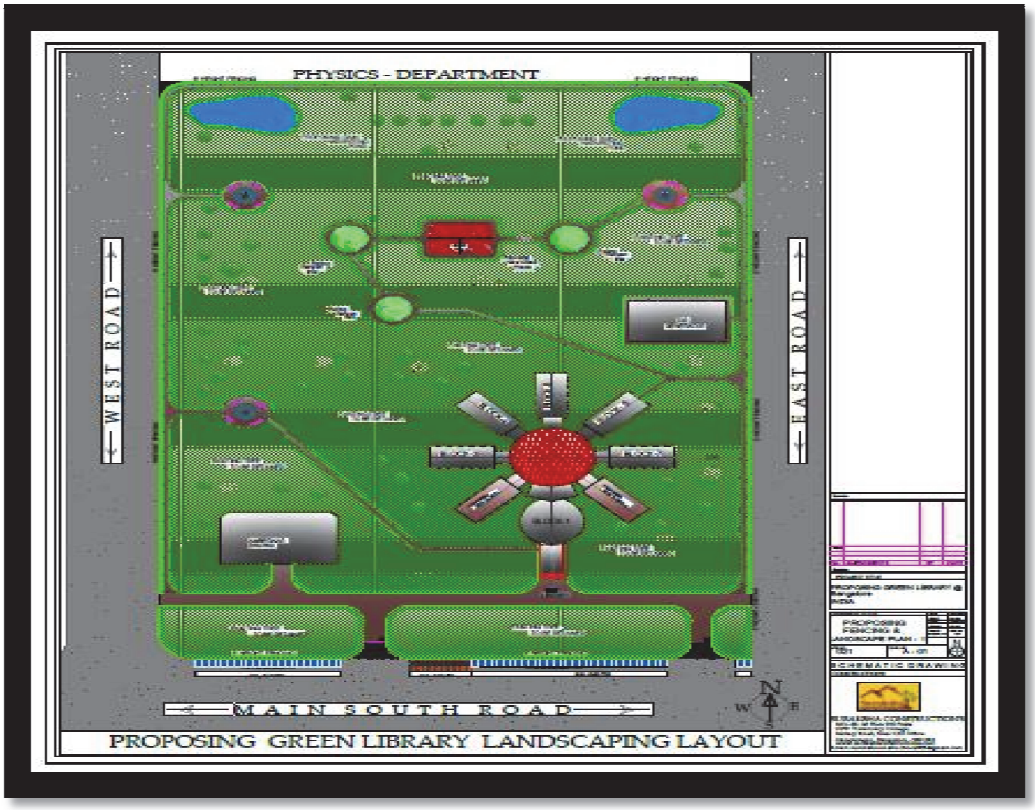
- To promote the concept of sustainability, the Bangalore University library at JnanaBharathi Campus is creating a study atmosphere in a green environment. The university is using 10 acres of land around the library to create a clean area with new dimensions like informative boards, pergolas, pathways, and meditation corners, spaces for deep studies and group discussions, and paths for heritage walks. The main goal is educating users and spreading awareness about sustainability through the green library web page, documentary projections, lectures, public discussions, and book promotions.
- Earlier, our education system was based on the 'talk less and read more' principle. But today, we focus on more engagements with students. Libraries have also started to work in line with the changing student needs. We are using the land around the library to create sitting space and pathways for discussions. Focus has been given to research scholars who want to discuss their thesis with guides.
- The "Green Library Project" to provide better and more comfortable facilities/services to BU library users in terms of **Read, Relax, Refresh**. It is an eco-friendly library. '**Walk and Read'**. '**Read and Relax'.'Read and Refresh'.**

## Benefits of BUL Readerswith Initiating the Green Library Project

- Bangalore University Sets Up The First 'Green Library' With E-Books & Amphitheatre On Campus.In an attempt to adapt to the new normal and to attract more readers to the library, Bangalore University (BU) is working on the concept of a 'green library'.
- For those who are wondering, a green library is a much-needed collaboration of books and green cover comprising dense vegetation, spread over 10 acres of land. The project started by the BU is estimated to cost about Rs 1.5 crore. Not just that, the project has already begun to take shape in phases.
- Creating four pergolas and a couple of machans amid the age-old banyan trees on the 10 acres around the existing library is part of the project. Though, they had already created a dense forest using the Miyawaki method where close to 10,000 native tree species were planted around the library. There are aromatic flower-bearing trees as well.
- Students can take a book from the stack and sit anywhere in the garden, which is linked to our digital repository of more than 62,000 e-books.
- The BU is also planning to convert the old canteen building within the 10-acre park into a language lab and Care Information Resource Centre (CIRC).
- An open-air amphitheater too will be set up for seminars and presentations.
- The students and faculty will be able to take their electronic gadgets and read in this open space that will cover ten acres. They can download books on the university's library app, which, officials claimed, will have over one crore books.
- BU has tied up with the National Digital Library of India for this initiative. The space will also have free Wi-Fi.

## Space and Equipment in the Green Library Project

The University plans to blend its existing library with the adjoining green cover comprising dense vegetation, which is spread over 10 acres. The project, estimated to cost about Rs 1.5 crore, has begun to take shape in phases.




**Picture of Planning of Green Library Project**

The second phase includes Pathway, Pergolas, Meditation Zone, Open Air Theatre, Cafeteria, informative boards, librarian platform, Faculty corner, Wi-Fi facility and drinking water, etc.

- **Librarian platform**Librarian corner or platform is an opportunity for students research scholars and faculty members to discuss with librarians and library professionals library resources and services if they have any kind of issues regarding the library they can discuss with a librarian on the librarian platform.
- **Faculty Corner:** faculty corner or platform is an opportunity for all the faculty members to discuss their issues regarding the department's interdisciplinary activities, university, students and research activities, etc.
- **Students Platform**For students, it is a big platform to conduct academic and cultural and other activities on this campus.

## Facilities

- **Pathways**Walking is a great way to be more active and to gain health benefits. Library users can walk with subordinate friends, colleagues, and also their teachers for health discussion regarding various issues. The pathways are part of the project is planned to create two types of pathways 1. Main Pathway and sub pathway, the main pathway will be created in 4 meters of width and which is connected to all the blocks of the green library. 2. Sub pathway will be created in 2 meters of width, which is connected to all the main pathways of the green library. The benches will be put beside the main and subways of the green library which will help users to sit, read, relax, and discuss with their subordinates. The beautiful lights are also put beside the pathways of the green library
- **Pergolas** are the main part of the green library project is planned to construct three pergolas for the benefit of BU library users.It can help Students, Researchers, and Faculties to the site, read, debate, discuss, and relax.
- **Meditation Zone** is also a platform for anyone interested in gathering knowledge and or practicing meditation methods, tools, and techniques that will help you understand and greatly benefit in psychological, physiological, emotional, and spiritual wellness knowledge and or practicing meditation methods, tools, and techniques that will help you understand and greatly benefit in psychological, physiological, emotional, and spiritual wellness. There are many benefits of meditation in nature—it's a place where wisdom and perception come alive.
- **Sports Zone**Sports bring discipline to life. It teaches the way of sitting, talking, walking, etc. Without sports in human life it seems too boring, sports activate all the cells and keep the body active, fit and slim. Sports improve thinking ability and reduce the stress of the mind. Sports Zone is a very essential part of the green library. Through sports, there is a good balance of physical and mental growth, which constructs in students the importance of a healthy lifestyle.
- **Open Air Theatre** The green library keeps the environment around always cool, comfortable, and healthy. The Open Air Theatre will be built beside the library it includes more than 300 capacity seats, which always hosts a variety of cultural programmes for a different group of students. Evenings make the campus colourful and most fascinating as students participate in these programmes.

## Basic Amenities

- **Informative Boards**: Informative Boards are very important to convey information and encourage participation, impart information and facilitate communication. Both traditional and online Informative boards save time, keep people informed, and can serve a variety of purposes. The library we are planning in the green library to put some informative boards wherever necessary those boards may help users convey library information sources and services etc.
- **Drinking water**Drinking water, also known as potable water, is water that is safe to drink or use for food preparation. The amount of drinking water required to maintain good health varies, and depends on physical activity level, age, health-related issues, environmental conditions, and carrying nutrients and oxygen to your cells. Flushing bacteria from your bladder. Aiding digestion. Preventing constipation. We would like to provide very well and purified water to our library users in the green library.
- **Cafeteria:**is very important for students in college or university which provides a place for students to study, eat, socialize, and acclimatize to college/university life, the cafeteria proved to be an integral part of a student's development and college/university education. Hence in the green library, we would like to build a beautiful outdoor cafeteria for our library users it may help them to study, eat, socialize, and acclimatize with their classmates and colleagues.
- **Photocopy services:** Reprographic service is the act of producing a fresh copy of a document, and it is now taking the centre stage in Green library services by making an original document available to the user. In essence, reprographic services epitomize the concept of collaboration between libraries.
- **Cyber café**: University Internet cafés can be characterized as Internet cafés as one might find commercially but they are located on university campuses and are specifically designed to serve the academic community. University Internet cafés have several advantages compared to public Internet cafés. Additionally, there are additional facilities in University Internet cafés — such as preparing assignments, watching films, and downloading files — which are not supported in public Internet cafés. Printing costs and other media are less expensive compared to public Internet cafés
- **Wi-fi:** Provide wi-fi facility in the green library. It allows these devices--and many more--to exchange information with one another, creating a network. Internet connectivity occurs through a wireless router. When you

access Wi-Fi, you are connecting to a wireless router that allows your Wi-Fi-compatible devices to interface with the Internet.

- **Restrooms:**restrooms will be provided for users and they can play a prominent role in a library for the users. A clean and sanitary restroom increases the use of library resources and services.

## Conclusion

Green design is an emerging trend, defining the library of the 21st century. Green Library Movement committed to greening libraries and reducing eco-degradation. Librarians should use their way of going green to promote a powerful green image towards their stakeholders and users. In this connection. The Bangalore university library has taken a very good step to create a green library. The "Green Library Project" to provide better and more comfortable facilities/services to BU Academic community in terms of Read, Relax, Refresh. It is an eco-friendly library. 'Walk and Read'. 'Read and Relax'. 'Read and Refresh'.It is educating users and spreading awareness about sustainability through the green library web page, documentary projections, lectures, public discussions, and book promotions.

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# Libraries During Covid-19 Pandemic

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## Abstract

*The purpose of the library is to preserve and transmit the recorded knowledge. Libraries and librarians are inseparable from the society in which they serve and the society in which they live. Thus, a library in a pandemic is indispensable. The whole world is suffering from the COVID-19 pandemic, every institution, industry and public domain has been affected by the Corona virus. In this pandemic situation, libraries have been the gateways of relevant information and knowledge for conducting research and development on the related subject areas. The Library and Information services started to gain importance by providing researchers the opportunity to explore medical and scientific research while preventing the disease. This Article brought out recent technological advancements and preventive measures taken to enhance the knowledge of library professionals to promote library resources and services.*

**Keywords:** *Library resources, Information technology, COVID-19 Pandemic, Preventive measures, Library services.*

## Introduction

Worldwide, government authorities have implemented public safety measures to prevent the spread of the COVID-19 virus in their respective countries. Universities quickly responded and modified operations, services and procedures, which included University and Scientific Libraries quickly closing and moving to providing library services virtually. Libraries around the world have been facing lockdown challenges in providing access to their collections and services. All types of libraries have promoted their digital services during the corona virus pandemic situation. However, the physical resources are often put on demand by

types of libraries have promoted their digital services during the corona virus pandemic situation. However, the physical resources are often put on demand by the users most preferably in the scientific organizations where research on drugs and pharmaceuticals is being carried out for medical diagnosis and drug discovery. Libraries having a significant number of e-resources may have enough opportunities to serve their users even in the lockdown period throughout the world. Several Libraries have brought out their digital services by organizing virtual exhibitions, highlighting content on the websites and Lets Read Together online campaign. There have also been major efforts to boost access to the library resources online as well as offline, for example by increasing the number of e-Books/ e-Journals/CD-DVD, etc. to lower the risk of virus spread.

## Scope of the Libraries

Technological advancements and innovations have transformed traditional libraries into the present smart Libraries. Today's Libraries offer a wide range of innovative services to the users for their information needs in the pandemic situation. There has been a paradigm shift in libraries in the twenty-first century. The major role of libraries in the selective dissemination of information and knowledge among their users predefine the scope of libraries. Libraries are the storehouses of knowledge recorded in physical/digital mediums. Libraries are a growing organism and therefore continue to increase library collection and services. Unlike the traditional libraries, present trends of libraries include digital/virtual mode of the library collection and also offer remote access facility for their users. The application of Information and Communication Technologies (ICT), the Internet and particularly the World Wide Web has revolutionized library activities, hence there have been changes in the normal functioning of Libraries in the digital world. The present trend of library resources includes e-books, e-resources, digital libraries, e-services etc. The prospects of smart libraries would involve utilization of skill and knowledge whereas the information is also recorded, stored, retrieved and disseminated in the e-format at a large scale. In epidemics and during the COVID-19 pandemic situation, when information outbreak is enormous, it is the time to remind the society of the importance of libraries and the role of librarians in organising and disseminating the information. Accurate information is the key to handle the chaotic situation. Exchange of false information seems to be on the rise. It has created a situation of 'infodemic' as stated by the Director-General of the World Health Organization (WHO). This has not only affected research work severely but has also created chaos among the laypeople.

## Present Trends of Library Services

COVID-19 Pandemic does not seem to be eradicated. Librarians are looking forward, exciting to discover new services and opportunities to build a stronger library-user interface in the future. To achieve these goals libraries need to be equipped with the latest infrastructure, information communication technologies and skilled manpower.

## Virtual Library Services

1. Virtual Reference services like chat/e-mail
2. Self-check-in and checkout of books
3. Scanning of chapters from books, journals articles for remote users
4. LibGuide- List of resources available in the library
5. Update library website dynamic content and useful tutorials

## About COVID-19 Virus and Its Spread

World Health Organization (WHO) has declared the COVID- 19 pandemic. COVID-19 or Coronavirus Disease is being caused by a newly discovered coronavirus. Old-age people with underlying medical problems like cardiovascular disease, diabetes, chronic respiratory disease, and cancer are more likely prone to serious illness. The Common symptoms of COVID-19 include high fever, tiredness and a dry cough. Other symptoms include shortness of breath, aches and pains, sore throat, and very few people will report diarrhea, nausea, or a runny nose. The Spread of Coronavirus people to people occurs through the spread of droplets like respiratory droplets when an infected person sneezes in the public domain.

In the case of Libraries where books come in contact with many persons at a time, therefore, the chances of virus transmission can occur by direct contact with the infected user and indirect contact with surfaces in the library or with objects used by the infected user/staff. To understand and know more about the disease World Health Organization is releasing daily updates on the situation at the global level. To find out more about the virus, go through the WHO's research pages or the Massive Open Online Courses (MOOCs) on the virus prepared by the WHO.

Handling of study materials in the libraries  Although, there is a huge risk of infection through objects carrying coronavirus yet the use of library resources is equally important to research the ongoing projects. Librarians know a day has to

extend library services on a safer mode by following the standard operating procedure or the Government Guidelines. Because of the above, some libraries have imposed a waiting period (quarantine) for the Issue/ return of books. Different countries have set their operating procedure to handle the Library resources, for example, the Australian Library and Information Association has suggested cleaning with alcohol wipes with plastic covers, such as DVDs, etc. The Italian Library Association, in addition to the above, has suggested that users could be asked to indicate if materials being returned have been in contact with someone with the virus. Preventive Measures and Guidelines / SOP for Libraries during COVID-19 Pandemic

Libraries are facing challenges and restrictions in the lockdown. Governments regularly are taking different approaches, sometimes ordering the full closure of all institutions, in these situations library professionals may take the following preventive measures to curb the spread of COVID- 19 through the libraries:

1. Stay at home if you feel sickness
2. Use appropriate sanitizer frequently
3. A roster of staff duty
4. Keep books at a separate place at least for 48 hours when check-in/check out
5. Maintain social distance
6. Follow good health and hygiene habits
7. Limiting concentration of users in the reading room allowing just one table per user
8. Use a mask and cover while sneezing or coughing

## Important/Useful links for Digital Library and E-Resources

For all those library users who have developed or developed online reading habits, there are several digital libraries offering reading material free of cost, the links are given below:

Table 1:

| S. No. | Title / Name | Description | Web Address / URL |
|---|---|---|---|
| 1 | NDLI | Educational materials available for all subject areaslike Technology, Social Science, Literature, Law, Medical, etc. | https://ndl.iitkgp.ac.in/ |
| 2 | Internet Archive | Internet Archive: is a non-profit library of millions offree books, movies, software, music, websites, and more. | https://archive.org/ |
| 3 | Hathi Trust | HathiTrust is a partnership of academic and research institutions, offering a collection of millions of titles digitized from libraries around the world. | https://www.hathitrust.org/ |
| 4 | World Digital Library | The World Digital Library provides free access tomanuscripts, rare books, maps, photographs, and other important cultural documents from all countries. | https://www.wdl.org/en/ |
| 5 | Khan Academy | Khan Academy non-profit educational organization. It provides short lessons in the form of videos. | https://www.khanacademy.org/ |

| | | | |
|---|---|---|---|
| 6 | Open Library | Open Library is an open-source web page for every book ever published. | https://openlibrary.org/ |
| 7 | Project Gutenberg | Project Gutenberg is a volunteer effort to digitize and archive cultural works. | https://www.gutenberg.org/ |

## Opportunities of Learning with the Virtual Platform/Webinar in the Libraries

This is time for library professionals to avail opportunities and improve their skills/ability for outreach in the virtual environment. They can organize virtual seminars or webinars, when a seminar is conducted online with the help of software it is called the webinar. Now a day, there has been a trend of the webinar and there is some specialized applications/software to conduct the virtual meeting, webinar, video conferencing, live chat, etc. Web-based (virtual) seminar platforms can be used to conduct online meetings, lectures, and conferences. Webinar software provides the online platform, where mutual interaction between the speakers and attendees takes place to carry out audio-visual communication. Webinar software provides real-time interactive features like multiple hosts/clients, polls/voting, live chat, questions & answers, screen sharing, etc. This technology is also useful in online teaching, lectures, training and learning purposes. Downloading/connecting Links are given hereunder for a few applications/software, most of them offer free trial/module and require a simple process to run as indicated in the connecting links. Libraries can use these facilities for knowledge sharing purposes among the staff/researchers/users. Following are widely used webinar hosting software worldwide:

## Conclusion

library is the best resource to save people from rumours and misinformation in a pandemic. With physical libraries being shut, librarians are active in providing online information services to the general public. Many libraries are conducting information literacy programmes alerting people about COVID-19. It is suggested that during the locked down period, people can do leisure reading and writing. Moreover, through directed reading, bibliotherapy can be provided as therapeutic adjuvants in medicine and psychiatry in the solution of personal problems. Reader advisory services can be availed from the librarians

via electronic media which may help in relieving the agony due to the pandemic and the lockdown situation. Technological advancements have revolutionized library services in the digital era. Libraries on the web have become more competent and confident in terms of resource management and digitalization. Information societies are seeking information in digital format, therefore, library services depend upon skilled professionals. A library plays a vital role in data acquisition, storage, analysis, interpretation and dissemination of information among the library users. This article has brought out an opportunity to learn recent technological advancements to maximize the usage of library resources and services in worldwide lockdown and pandemic situations prevailing in the country. This article will provide an overview of preventive measures and current trends in libraries to play a proactive role in the present and post-pandemic situation.

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# A Comparative User Perception on Information Services During Pre and Post COVID Times in Kakatiya University Library

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## ABSTRACT

*This paper aims to assess and evaluate the user perceptions of library services during pre and post covid-19 times. The government of India has declared the pandemic and to control the same the lockdown has been implemented. Due to covid the movement of almost all people is cut down unless it is most essential. The main aim of this study is to analyses the library services providing to users in the pandemic curse. For this study a structured questionnaire was designed and distributed to the 480 library users, in the second week of February 2022. On the whole, respondents indicated that library services are adequate. Overall the study suggests that they were satisfied with the existing facilities and services in this pandemic.*

**Keywords:***Covid-19, pandemic, Information services, Kakatiya University*

## Introduction:

Corona virus has identified first in china. However, in India, the first case was identified in Kerala. The Government of India has declared the complete lockdown all over the nation according to the pandemic state of affairs. The covid pandemic has thrown our life completely out of control. That is why it is but appropriate that premier institutions of learning like colleges, universities, and many educational institutes should come forward to hold wide ranging deliberations on different aspects of the challenges and confronting now to seek out avenues on how to cope with them and turn these into opportunities. During the pandemic period, the academic education system, in most cases, is collapsed. So, the importance of the library is recognizing very high at this time. In this scenario the researcher would like to reveal the situation of the library in pre and post-covid period, libraries also joined in this series to cater the needs of its patrons. University libraries cater the services to faculty, researchers, students and other staff members to meet their information needs. Libraries occupy an important place in the framework of the academic system. The quality of teaching and research activities in any university system depends on information services offered by the libraries.

## University at a glance:

Kakatiya University was established on 19th August 1976 to fulfil the aspirations of the Telengana people for higher education. The founding of the University was in fact a historic event in the sense that heralded a new era in the realms of higher education of this region. The erstwhile Post-Graduate Centre of Osmania University was upgraded and named Kakatiya University. The development of the University over the years has been gradual but impressive. The University was initially accredited with B+ grade by the NAAC in 2002 and reaccredited with A grade in 2008 and 2017. The University situated in a sprawling area of about 650 acres, has now 28 departments in four colleges on the campus with a network of eleven constituent colleges and 471 affiliated colleges. It has its Post-graduate Colleges at Subedari (Hanamkonda), Godavarikhani, Jangoan, Mahabubabad, Bhupalapally, Khammam and Kothagudem in addition to University Engineering College at Kothagudem. The University is now offering programmes is engineering, Pharmacy, Law, Computer Science, Business Management, Education, Science, Arts, Commerce, Oriental courses in the University, constituent and affiliated colleges. In addition, the School of Distance Learning and Continuing Education (SDLCE) is offering a large number of programmes through distance mode. It has a spacious Central Library with a rich collection of 1, 50,000 books in addition to 31,000 back volumes of research journals.

## About library:

The Central Library is centrally placed and easily accessible to all the departments in the campus. The right side of the library all the social science departments and left side of the library all the science departments were located. The library serves the information needs of the students, research scholars, teaching faculty and non-teaching staff of the University with a good numbering of borrowers. As on closing of the financial year 2021 the library has a rich collection of 1,51,000+ books in addition to 31,000+ back volumes of research journals as print resources in various subjects, e-resources including more than 30 e-books, nearly 1200 CDs, Digital Library which includes DELNET and UGC_INFONET online journals subscription, etc and 43,000+ e-journals in its credit. All the constituent colleges and departments were brought under Campus Network providing round the clock INTERNET facility.

## Objectives:

1. To know the respondents frequency of visit to library in pandemic.
2. To identify the infrastructure facilities provided by the library
3. To examine the services offered by the library

4. To expose the facilities offered by the library
5. To reveal the response with regard to the library staff
6. To recognize the level of satisfaction on overall library infrastructure, facilities and services.

## Methodology:

The present study is purely based on primary data collection from the library users and using a survey method by questionnaire tool. The study consists of Students, Research Scholars, Faculty Members (including contractual) of Central Library, Kakatiya University, Warangal. The questionnaires were distributed to the 480 members; out of that 405 were responded and received back, who are available at the time of data collection. The response rate is (83.01%) and the collected data were analyzed through simple percentages and graphs to reach the aim of the research.

## Data Analysis and interpretation:

Table 1: Distribution of respondents according to academic status

| Academic status | Respondents | |
|---|---|---|
| | In number | In Percentage |
| Students | 315 | 77.77 |
| Research Scholars | 48 | 11.85 |
| Faculty | 42 | 10.37 |
| Total | 405 | 100 |

Table 1 depicts that in the total population, 77.77 per cent are students, 11.85 per cent are Research Scholars and remaining 10.37 per cent are Faculty Members.

Table 2: Distribution of respondents according to their frequency of visit to library

| Frequency | Pre-Covid | | | Post-Covid | | | Grand Total |
|---|---|---|---|---|---|---|---|
| | Students | R.S. | Faculty | Students | R.S. | Faculty | |
| Daily | 14 (9.27) | 3 (12.00) | 1 (5.26) | 18 (10.84) | 1 (4.76) | 1 (4.34) | 38 (7.79) |
| Twice in a week | 47 (31.12) | 9 (36.00) | 14 (73.68) | 36 (21.68) | 5 (23.80) | 3 (13.04) | 114 (22.73) |

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| Once in a week | 64 (42.38) | 1 (4.00) | 1 (5.26) | 71 (42.77) | 3 (14.28) | 5 (21.73) | 145 (36.14) |
| According to their wish | 26 (17.21) | 12 (48.00) | 3 (15.78) | 41 (24.69) | 12 (57.14) | 14 (60.86) | 108 (33.33) |

(Note: Numbers in parenthesis indicate percentages)

It is evident from Table 2 that a majority of the respondents (36.14%) replied that they visit the library once a week with regard to frequency of visiting the library, 33.33 per cent visit according to their wish, 22.73 per cent visit twice in a week and remaining 7.79 per cent mention that they visit library daily.

Diagram 1: Library infrastructure facility

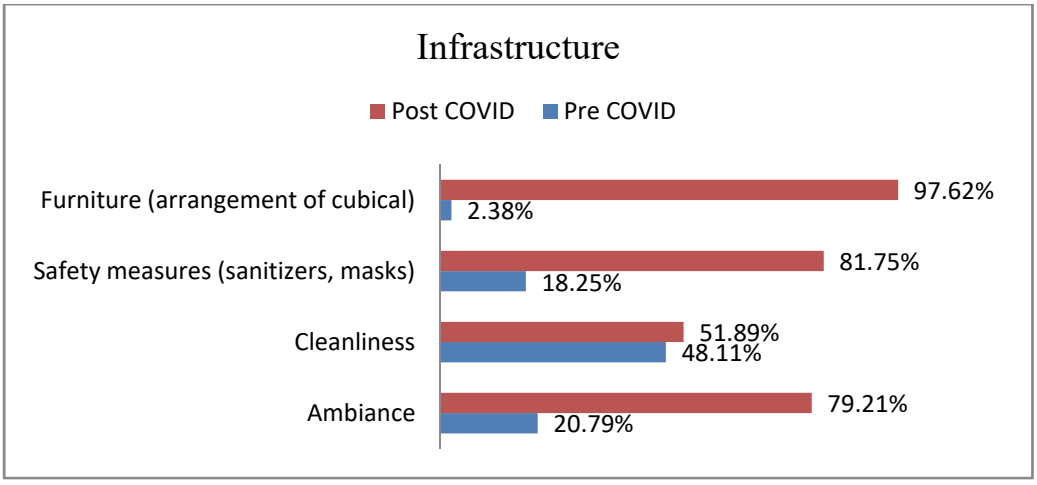



Diagram 1 reveals the awareness about library infrastructure that, the majority of the respondents (97.62%) are given about furniture (arrangement of cubicles), followed by safety measures (Providing the sanitizers and masks) 81.75 per cent; ambiance is 79.21 percent and remaining is cleanliness 51.89 per cent.

Table No: 3- User satisfaction about library infrastructure

| Response | Pre-Covid | | | Post-Covid | | | Grand Total |
|---|---|---|---|---|---|---|---|
| | Students | R.S. | Faculty | Students | R.S. | Faculty | |
| Excellent | 95 (62.91) | 17 (68.00) | 5 (26.31) | 94 (56.62) | 16 (76.19) | 15 (65.21) | 242 (62.32) |
| Good | 38 (25.16) | 6 (13.04) | 5 (26.31) | 32 (19.27) | 3 (14.28) | 5 (21.73) | 89 (17.62) |
| Satisfactory | 18 (11.92) | 2 (8.00) | 9 (47.36) | 40 (24.09) | 2 (9.52) | 3 (13.04) | 74 (15.45) |

It is evident from Table 3 that majority of the respondents have satisfaction about library infrastructure. The majority of the respondents (62.32%) are given excellent, followed by good 17.62 per cent; and satisfactory 15.45 per cent. It can be concluded that majority of the respondents are extremely satisfied about the library infrastructure mainly in providing the furniture (arrangement of cubicles) in post-covid period.

Diagram 2: User awareness about library services

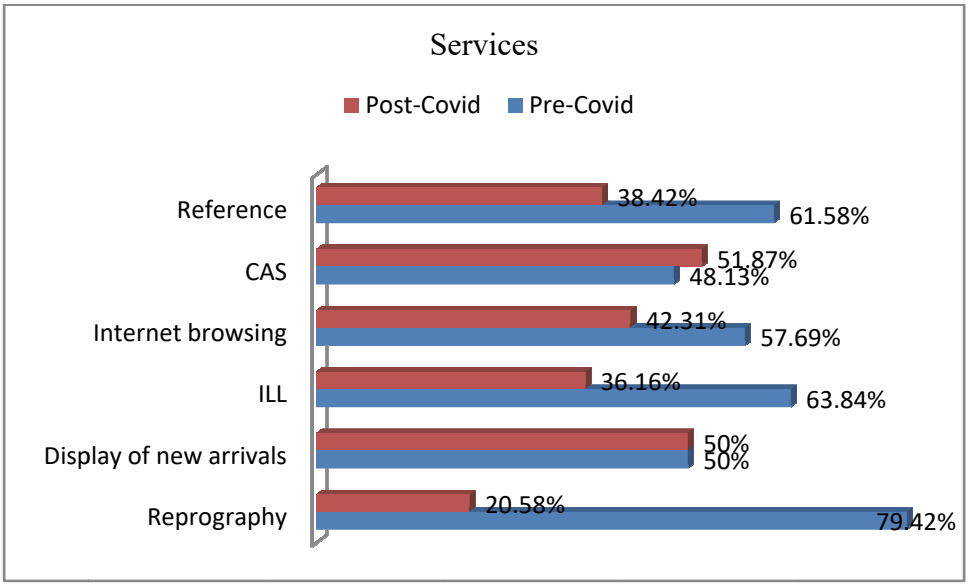


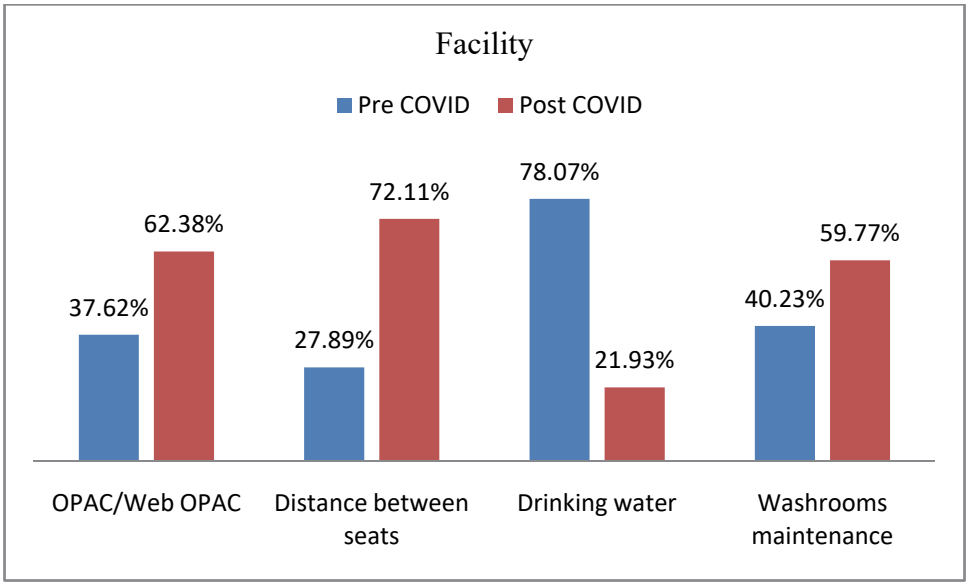

Diagram 2 depicts the awareness about library services, the majority of the respondents given Reprography is 79.42 per cent, followed by ILL 63.84 percent, reference and retrieval 61.58 per cent, 57.69 percent for Internet browsing, current-awareness service 51.87 percent, and display of new arrivals 50 per cent.

Table: 4- User satisfaction about library services

| satisfaction | Pre-Covid | | | Post-Covid | | | Grand Total |
|---|---|---|---|---|---|---|---|
| | Students | R.S. | Faculty | Students | R.S. | Faculty | |
| Excellent | 15 (9.93) | 5 (20.00) | 1 (5.26) | 43 (25.90) | 2 (9.52) | 5 (21.73) | 71 (17.53) |
| Good | 118 (78.14) | 17 (68.00) | 17 (89.47) | 107 (64.45) | 18 (85.71) | 16 (69.56) | 293 (72.34) |
| Satisfactory | 18 (11.92) | 3 (12.00) | 1 (5.26) | 16 (9.63) | 1 (4.76) | 2 (8. 69) | 41 (10.12) |

Table 4 reveals that majority of the respondents level of satisfaction about library services is good. The majority of the respondents (72.37%) are given good, followed by excellent 17.53 per cent; and satisfactory 10.12 per cent. It can be concluded that majority of the respondents are satisfied about the library services mainly is reprography system in the institutions during the pre-covid time than the post-covid time.

Diagram 3: User attentiveness about library facilities



From the above diagram 3 it is clear that respondent's attentiveness about library facilities. The majority of the respondents (78.07%) given positive response about drinking water facility are good in pre-covid times. On the other hand in post-covid period respondents have given 72.11 per cent that distance between seats, OPAC/Web OPAC 62.38 per cent; and maintenance of washrooms 59.77 per cent.

Table No: 5- User satisfaction about library facilities

| Response | Pre-Covid | | | Post-Covid | | | Grand Total |
|---|---|---|---|---|---|---|---|
| | Students | R.S. | Faculty | Students | R.S. | Faculty | |
| Excellent | 128 (84.76) | 8 (32.00) | 3 (15.78) | 129 (77.71) | 17 (80.95) | 20 (86. 95) | 305 (76. 62) |
| Good | 13 (8.60) | 6 (24.00) | 2 (10.52) | 21 (12.65) | 1 (4.76) | 1 (4.34) | 44 (12. 89) |
| Satisfactory | 10 (6.62) | 11 (44.00) | 14 (73.68) | 16 (9.63) | 3 (14.28) | 2 (8.69) | 56 (13.87) |

It has been found from table 5 that majority of the respondents level of satisfaction about library facilities is excellent. The majority of the respondents (76.62%) are given excellent, followed by satisfactory 13.87 per cent; and good 12.89 per cent. It can be concluded that majority of the respondents are satisfied about the library facilities mainly in providing the drinking water facility are excellent in pre-covid times.

Table: 6- User response with regard to staff

| Staff | Pre-Covid | | | Post-Covid | | | Grand Total |
|---|---|---|---|---|---|---|---|
| | Students | R.S. | Faculty | Students | R.S. | Faculty | |
| Staff responsibility to find out the book | 31 (20.52) | 2 (8.00) | 4 (21.05) | 19 (11.44) | 1 (4.76) | 1 (4.34) | 58 (14.32) |
| Staff is competent and helpful | 79 (52.31) | 18 (72.00) | 14 (73.68) | 116 (69.87) | 19 (90.47) | 21 (91.30) | 267 (65.92) |

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| Staff immediately answers ready reference questions | 41 (27.15) | 5 (20.00) | 1 (5.26) | 31 (18.67) | 1 (4.76) | 1 (4.34) | 80 (19.75) |

It is evident from above table that majority of the respondents (65.92%) replied that staff is competent and helpful in library, 19.75 per cent given staff immediately answers ready reference questions and remaining 14.32 per cent are mentioned staff responsibility to find out the book.

**Conclusion:**

The study concludes that the user perception on information services pre and post covid pandemic times is varied. The whole world is fighting to overcome and control this challenge of astonishing virus. In, India the situation is very critical, even though people understand the consequences and given co-operation to Government. The purpose of study was to know the level of facilities and services towards pre and post covid period in Kakatiya University Library, Warangal. The study results are positive mostly in the post-covid time. Majority of the respondents are satisfied the services rendering by library after covid-19 pandemic.

**Findings:**

1. Majority of the respondents (36.14%) visit the library once a week with regard to frequency of visiting the library, followed by 33.33 per cent visit occasionally.
2. Majority of the respondents (62.32%) are given excellent with regard to satisfaction about library infrastructure, followed by good 17.62 per cent. It can be concluded that majority of the respondents are extremely satisfied about the library infrastructure mainly in providing the furniture (arrangement of cubicles) in post-covid period.
3. Majority of the respondents (79.42%) are aware about library services mainly reprography, followed by ILL 63.84 per cent.
4. Majority of the respondents (72.37%) given their level of satisfaction about library services are good, followed by excellent 17.53 per cent. It can be concluded that majority of the respondents are satisfied about the library services mainly reprography system in the institutions during the pre-covid time than the post-covid time.

5. Large majority of the respondents (78.07%) given positive response about drinking water facility followed by distance between seating arrangements 81.82 per cent.
6. Majority of the respondents (76.62%) level of satisfaction about library facilities is excellent and followed by satisfactory 13.87 per cent. It can be concluded that majority of the respondents are satisfied about the library facilities mainly in providing the drinking water facility are excellent in pre-covid times.
7. Majority of the respondents (65.92%) replied that staff is competent and helpful in library, 19.75 per cent given staff immediately answers ready reference questions.

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# CBSE SCHOOL LIBRARY SERVICES

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## Abstract:

*School library is regarded as the heart and soul of the school. It acts as learning resource centre and support the school curriculum in all possible manners. The main aim of this paper is to document the factors associated with CBSE School Library service among students. According to IFLA/UNESCO School Library Manifesto, "The school library provides information and ideas that are fundamental to functioning successfully in today's information and knowledge-based society. The school library equips students with life-long learning skills and develops the imagination, enabling them to live as responsible citizens*.

**Purpose** – School library is regarded as the heart and soul of the school. It acts as learning resource centre and support the school curriculum in all possible manners. The main aim of this paper is to document the factors associated with library management in selected school libraries in Varanasi, India. Design/methodology/approach – Survey method is used to conduct this research in which close-ended questions were provided to the school librarians. Simple random sampling was used to collect samples from secondary schools of Varanasi. Findings – It was found that 34% school libraries affiliated to Central Board of Secondary Education are managed properly and they are termed as first class library. Rest of the schools are not managed as per rules and regulations of school librarianship. Some librarians themselves are not properly aware of the significance of the library and hence the management is suffered accordingly. Practical implications – This research will help in exploring the existing status of library management in school libraries. The work is designed specifically for school libraries. Simple ranking system for school libraries will be helpful to make an exhaustive school ranking based on library management. Originality/value – This research will bring on record the ground reality of school librarianship in India and the way they are managed. Simple ranking system for school library is given in this paper that will help to find out which school library is functioning properly or not.

**Keywords** *Library management, School library, Status of library, School library ranking*

Paper type Research p School library is regarded as the heart and soul of the school. It acts as learning resource centre and support the school curriculum in all possible manners. The main aim of this paper is to document the factors associated with library management in selected school libraries in Varanasi, India. Design/methodology/approach –Survey method is used to conduct this research in which close-ended questions were provided to the school librarians. Simple random sampling was used to collect samples from secondary schools of Varanasi. Findings –It was found that 34% school libraries affiliated to Central Board of Secondary Education are managed properly and they are termed as first class library. Rest of the schools are not managed as per rules and regulations of school librarianship. Some librarians themselves are not properly aware of the significance of the library and hence the management is suffered accordingly. Practical implications –This research will help in exploring the existing status of library management in school libraries. The work is designed specifically for school libraries. Simple ranking system for school libraries will be helpful to make an exhaustive school ranking based on library management. Originality/value –This research will bring on record the ground reality of school librarianship in India and the way they are managed. Simple ranking system for school library is given in this paper that will help to find out which school library is functioning properly or not. Keywords Library management, School library, Status of library, School library ranking Paper type Research paper.

## Introduction:

School libraries have always been an indispensable adjunct to education, a base for gathering innovative thinking, a stimulus to culture and an aid to self-development (Onal, 2009). Morris (2004) contends that a school library serves as a center and coordinating agency of all materials used in the school. The IFLA/UNESCO School Library Manifesto (2000) while emphasizing the creation of strong and effective school libraries mandates that "for each country there should be work on developing links between school objectives and its library services." Thus, the contemporary school library has moved beyond the concept of mere an isolated facility for housing of books and other materials which has no role to play in the teaching-learning process in a school. Rather, it is seen more as the structure for integration of the library services with school's curriculum in the current world education scenario.

## Role of School Libraries:

School is a gateway to knowledge and plays an important role in building up a love for reading. The school library is integral to this educational process. Encouraged at the right age, the children are sure to develop a love for books. "Catch 'em Young" is therefore the motto of the school libraries. According to IFLA/UNESCO School Library Manifesto, "the school library provides information and ideas that are fundamental to functioning successfully in today's information and knowledge-based society. The school library equips students with life-long learning skills and develops the imagination enabling them to live as responsible citizens". It plays this role by selecting, acquiring and providing access to appropriate sources of information.

The school library offers books and other resources ranging from print to electronic media for completion of various school projects and assignments, for acquisition of knowledge about a topic taught in class, for finding information about a hobby or current events and news, etc. The school librarian helps the students in finding the books/information on the topics of their interest. The librarians along with the teachers work together to achieve higher levels of literacy. While highlighting the role of the school library as the heart of school, Dr. Ranganathan stated that the school libraries should act as laboratories for students and the librarians should function as guides to help the students in learning and using the books for improvement of knowledge and scholarship.

## Standards for School Libraries:

The school library is essential for literacy, education and information provision as well as for economic, social and cultural development of a nation. Hence, the school libraries must have adequate and sustained funding for trained staff, materials, technologies and facilities. As the responsibility of local, regional and national authorities, it must be supported by specific standards. Library standards are used to measure and evaluate the condition of the libraries as well as the degree of their development. They provide an outline for specific library activities and serve to define an ideal state of a library. The standards, which are developed professionally, indicate a direction for the libraries as to what tasks and objectives it should strive for. They provide school management with information on the management of libraries. Standards can have an international, national and regional scope.

Internationally, standards are not only developed by the library organizations, such as IASL (International Association of School Libraries) and IFLA, but also by UNESCO or ISO. Keeping in view the vital role a school library plays in supporting the curriculum, such organizations have issued a School Library

Manifesto whose 1998version became a known text and is used by the school librarians all around the world. The manifesto indicates the role of school library, its mission and the most important tasks as well as the exceptional importance of a qualified school librarian. School Librarians: Guidelines for Competency Requirements' was published in the series- IFLA Profound Reports as number 41 in August 1995. The Library Association (CILIP) has also published a completely revised edition of the guidelines for school libraries in secondary schools' in 2002. These standards usually describe the staff requirements, acquisitions of collections, audiovisual and computer equipment as well as budgetary calculations.

## School Libraries in the Current Environment:

The school library is an essential partner in the local, regional and national library and information network. The school librarian has to be professionally qualified because he is responsible for planning and managing the library. Supported by the teachers, he not only inculcates love for reading amongst the future citizens of the country but also helps in information literacy. The role of school librarian as a teacher is to analyze the information needs of his clients for which he seeks help from the teachers. He must have good interpersonal skills and should be able to take on the decisional roles. The school librarian need to know what teachers like to work with and what information they need for teaching. Finally, the school librarian needs to know what is expected of the student and how and what are they being taught. In fact, the school librarians have to move away from the role of keeper of books to that of the information providers and support students in learning and using information regardless of its form and format. In an increasingly networked environment when the students at the school level are using IT skills for study, the school librarian must be competent in teaching different information handling skills both to teachers and the students. They help the teachers to use a broader range of teaching strategies and the students are helped in their project work, individual study, group research, reading and the teaching of ICT, etc. It has been observed that when the teachers and the school librarians work together, students achieve higher levels of literacy, reading, learning, and problem solving and information and communication technology skills. It has also been noted that the students in schools with good school libraries learn more, get better grades, and score higher on standardized test scores than their peers in schools without the libraries.

## School Libraries in India:

Although the college and university libraries have developed to a great extent as a result of the work done by UGC and INFLIBNET, the school libraries are a neglected lot in India. According to the 5th All India Educational Survey, only about 40% of the schools have libraries that too in public schools. Moreover, the situation in rural areas is worse than the urban areas. The number of the trained librarians working in the schools is still less. Although the central government has made libraries a priority to help raise the literacy rate, yet these are not receiving the right attention as revealed by the NCERT survey of 1993. Their resources in terms of staff and funds are scarce, as these have received the least priority. The school libraries neither have good collection nor sufficient space because of the financial constraints. Most of the schools have no qualified staff in their libraries. The libraries of public schools are slightly better as compared to their government counterparts. The situation is worst in case of libraries of government primary and middle schools. As a result, the school libraries are neither able to inculcate the reading interests among the children nor do they help in achieving information literacy. The documents in most of the school libraries are kept in cabinets under lock and key and are made available to the students on demand only. A traditional card catalogue and Dewey Decimal system for classification of the documents is normally used. A majority of the school libraries have no computers in the libraries although a good number of them have set up the computer laboratories. The librarians select the documents in consultation with the teaching staff.

The library acquires the magazines on current affairs and sports besides a number of daily newspapers in English, Hindi and other regional languages. The students of the primary classes have a library hour on the weekly basis when they are given storybooks so as to inculcate the reading habits. Majority of the school librarians in India do not provide any other service except the circulation of books in the absence of good library infrastructure. In 1998, the school library committee of the Indian Library Association surveyed the school libraries in Delhi and found that most of the government primary schools had no library at all and in secondary schools, the libraries were substandard. The report called for a fresh look at the way school libraries were organized. The committee also stressed that the library be made the hub of the school. Moreover, it was noted that the public (private) schools were better organized with better facilities like staff, collection and services as compared to the government schools. Such schools are continuously improving their collections and access to resources but the government schools suffer from lack of funds and staff. Majority of such schools does not even have a full time librarian and the teacher in-charge manages the library in the absence of the fulltime librarian. Although the number of school libraries in primary, secondary

and the higher education is growing, yet there are many problems to overcome. The government has left the responsibility of school libraries to the school themselves for providing the resources and funds to establish well-equipped libraries. Most of the schools do not have a separate room for the library especially in government primary schools. Since the school authorities are not convinced about the appointment of professional staff for their libraries, they do not appoint professionally trained staff. Until a few years ago, only a few secondary schools had libraries with qualified library staff. Moreover, they are not paid well and as a result the well-trained librarians leave the school library whenever they get an opportunity to work elsewhere. Moreover, the status of school librarian is also low in India. Generally speaking, libraries in public schools are in a better position in terms of space, budget and staff than their counterparts in the government schools. Most of the public schools have appointed trained librarians and are computerized also.

## Conclusion:

A library is a storehouse of information and a key to the knowledge, but the era of information technology revolution has relegated the librarians especially in schools to the background. The audiovisual media specially the Internet has lured the budding readers away from the printed works like the Pied Piper. There is a great need for the up liftment of school libraries in India. If the reading habits of the students have to be changed, the conditions of the school libraries have to be improved. For this purpose, the central as well as the state government, the school authorities, the school librarian and the teachers will all have to work together. The library associations at the state as well as the national level can also play a very important role in the development of school libraries in India. Indian Library Association should support international initiatives to promote school library activities and should promote the importance of school libraries through their publications. These should support research in school librarianship and undertake projects to help school libraries to effective perform the information literacy program. Indian School Library Association should be established on the pattern of other such associations the world over that should bring out a directory of school libraries, hold regular conferences for interaction amongst the school librarians and must bring out a journal featuring various aspects of school libraries.

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# THEME 4

# Metric Studies on OA Sources

# Growth of Scientometrics Literature in Open Access Publications as Mapped in Web of Science: An Exploration

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## Abstract

*The purpose of this study is to analyze the growth of open access publications on Scientometrics literature published by the global researchers/authors. The study aims to explore the growth of publications, document types, the most productive authors, countries, institutions, and also most productive journals etc. The Web of Science (WoS) database was used as a source for extracting the data and a total of 2333 documents on Scientometrics literature were retrieved from WoS during the period 1980-2021.The collected data was analysed using the "bibliometrix" tool developed through R programming language. The result found that 79.68% of the records are published in the form of articles, the author Bornmann L was the most productive author with 86articles and received 2528 citations, 27 h-index 47 g-index. The study result explored that China is the most productive country with 547 publications and 3253 citations. Furthermore, the journal Scientometrics is the most productive journal and published 1656 articles in Scientometrics literature.*

**Keywords:***Growth of publications, Open Access publications, Scientometrics, Web of Science.*

# 1. Introduction

The term "open access" refers to the removal of major barriers to scholarly research outputs being accessed, shared, and reused. The rationale is that ensuring rapid and widespread access to research findings will facilitate the research process by allowing all communities to build on them and participate in scholarly conversations (Veletsianos & Kimmons, 2012). Increased access to scholarly outputs might help foster a culture of greater scientific education and literacy, which in turn could have a direct impact on public policy (Zuccala, 2010; European Commission, 2011).

OA pertains to documents made available via two main pathways: the Gold route and the Green route (Harnad et al., 2008). The Gold route refers to freely accessible research articles at the point of publication. This route is often, although not always, accompanied by article processing charges (APCs). The Green route refers to author self-archiving, in which peer-reviewed articles and/or not peer-reviewed pre-prints are posted online to an institutional and/or subject repository, or a personal website. This route is often dependent on journal or publisher policies on self-archiving (sherpa.ac.uk/romeo).

OA also includes a moral aspect, where access to scientific knowledge and information is regarded as a fundamental feature of global human equality. For example, Article 27 of the United Nations Declaration of Human Rights states that "Everyone has the right to freely participate in the cultural life of the community, to enjoy the arts and to share in scientific advancement and its benefits" (United Nations, 1948).

Keeping in view the study has attempted to know the growth of Scientometrics literature on open-access publications published by the global researchers/authors. It also focused on the growth trend, impact of publications, most productive authors, countries, institutions, and journals.

## 2. Objectives of the study

The objectives of the study are:

- To know the types of documents published in open access on Scientometrics literature.
- To identify the publications growth trend in open access on Scientometrics literature.
- To identify the most productive authors, countries, institutions, and journals.

## 3. Scope and Methodology

The scope of the study is confined to know the open-access publications on Scientometrics literatures published by the global researchers/authors between the years 1980 to 2021. The year 1980 was the first literature published in open access on Scientometrics as shown in Web of Science database. To know the literatures, the Web of Science database was used. The search term "Scientometrics" has been entered in the search box of the Web of Science, later the search was refined to "open access" (*Search string: (Scientometrics (keyword), Timespan: 1980-01-01 to 2021-12-31 (Publication Date), Refined By "Open Access").* A total of 2333documentswere retrieved from the WoS database. Further, the data was analyzed using the "bibliometrix" tool developed through R programming language. It is a state-of-the-art tool that follows the classical bibliometric workflow (Aria & Cuccurullo, 2017). For analysis, "bibliometrix" package was installed into R Studio. Then, the downloaded text file containing the name of the author, title of the document, journal, year of publication, pages, number of citations, author's affiliation, abstract, author's keyword, references, type of document and corresponding author address of 2333 documents were imported to R studio. Afterward, the functions available in the package were executed to get descriptive and graphical results related to bibliometrics (Aria & Cuccurullo, 2020).

### 4. Analysis of Data and Interpretation

**Table 1. Types of documents on Scientometrics literature published in open access**

| Document types | No. of documents | Percentage |
|---|---|---|
| Articles | 1859 | 79.68 |
| Proceedings paper | 135 | 5.78 |
| Reviews | 110 | 4.71 |
| Editorial materials | 72 | 3.08 |
| Corrections | 64 | 2.74 |
| Letters | 43 | 1.84 |
| Data papers | 35 | 1.50 |
| Others | 15 | 0.64 |
| **Total** | **2333** | **100** |

Types of document included in the Web of Science are presented in Table 1. It is observed from the table that the majority 79.68% of the records are published in the form of articles. The table also shows that 5.78% of the Proceedings papers, Review (4.71%) and Editorial materials (3.08%) have been published in Web of Science. It is also observed from the table that only 0.64% of the documents are published in the form of biographical-item, retraction, book review, notes which are grouped under "others".

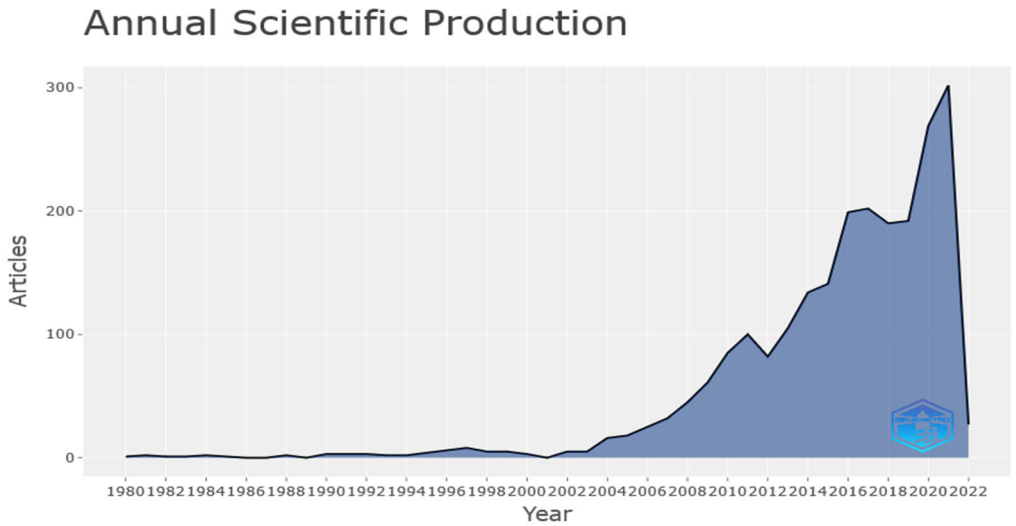



Figure 1. Growth of open access articles on Scientometrics literature

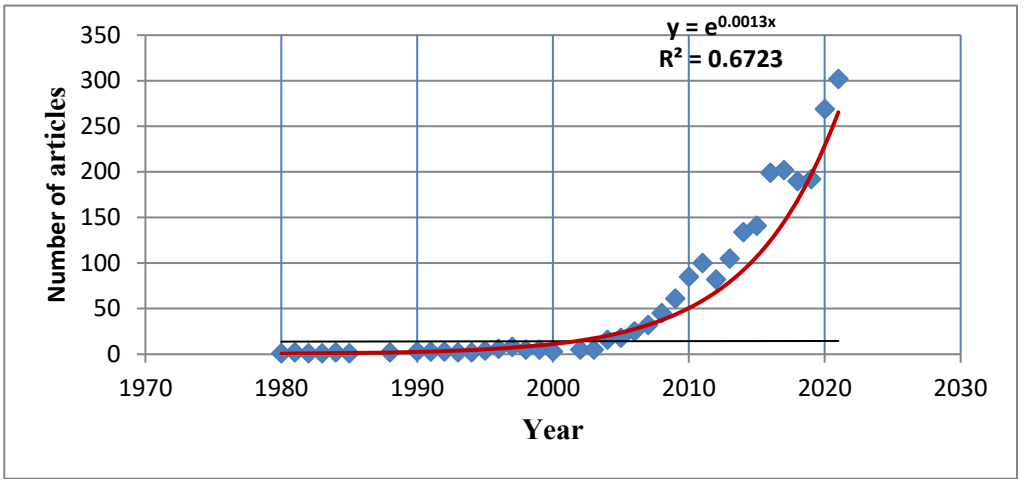



Figure 2. An exponential trend in open access publications on Scientometrics literature

**Table 2. Top ten most prolificauthors**

| Sl. no | Authors | NP | TC | h_index | g_index | m_index |
|---|---|---|---|---|---|---|
| **1** | Bornmann L | 86 | 2528 | 27 | 47 | 1.421 |
| **2** | Leydesdorff L | 66 | 3051 | 30 | 54 | 1.034 |
| **3** | Thelwall M | 51 | 1792 | 24 | 42 | 1.2 |
| **4** | Abramo G | 45 | 1147 | 17 | 33 | 1.133 |
| **5** | D'angelo Ca | 46 | 1117 | 16 | 32 | 1.067 |
| **6** | Glanzel W | 38 | 1210 | 17 | 34 | 0.548 |
| **7** | Egghe L | 32 | 1612 | 12 | 32 | 0.462 |
| **8** | Costas R | 28 | 888 | 16 | 28 | 1.067 |
| **9** | Haunschild R | 22 | 395 | 11 | 19 | 1.375 |
| **10** | Marx W | 17 | 447 | 13 | 17 | 0.929 |

Note: NP= Number of publications, TC= Total citations

Table 2 reveals the top 10 most productive authors and their impact on publications. It can be seen from the table that with respect to the total number of documents, Bornmann L has published 86 documents followed by Leydesdorff L (66) and Thelwall M (51). The table also reveals that the author Marx W. has 17 publications, and he secured the $10^{th}$ positions among top ten most productive authors. The table also indicates that the author Leydesdorff L has received 3051 citations and his h-index and g-index are 27 and 47 respectively followed by Bornmann L(2528) citations and h-index (30) and g-index are (54) and Thelwall M received 1792 and his h-index and g-index are 24 and 42 respectively, these authors are the most prolific authors among top ten authors with respect to number of publications, citations, h-index and g-index.

The study also tried to know the correlation between the number of documents published by the authors and citations which they have received. To

know the correlation between documents and citations the Pearson correlation test has been applied. The result of the test indicates that there is a positive correlation (r = .874) and the correlation is highly significant (p = .001).

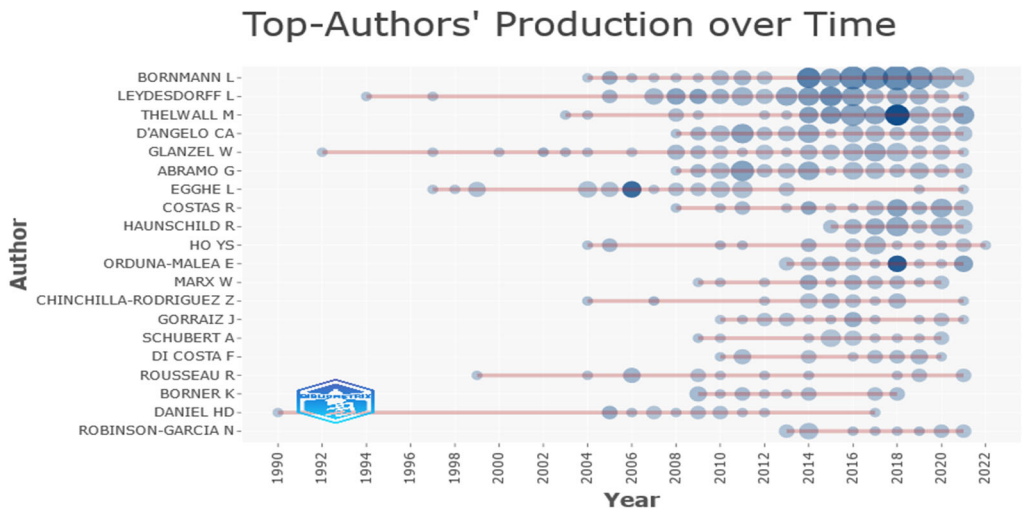



**Figure 3. Ranking of authors based on research productivity.**

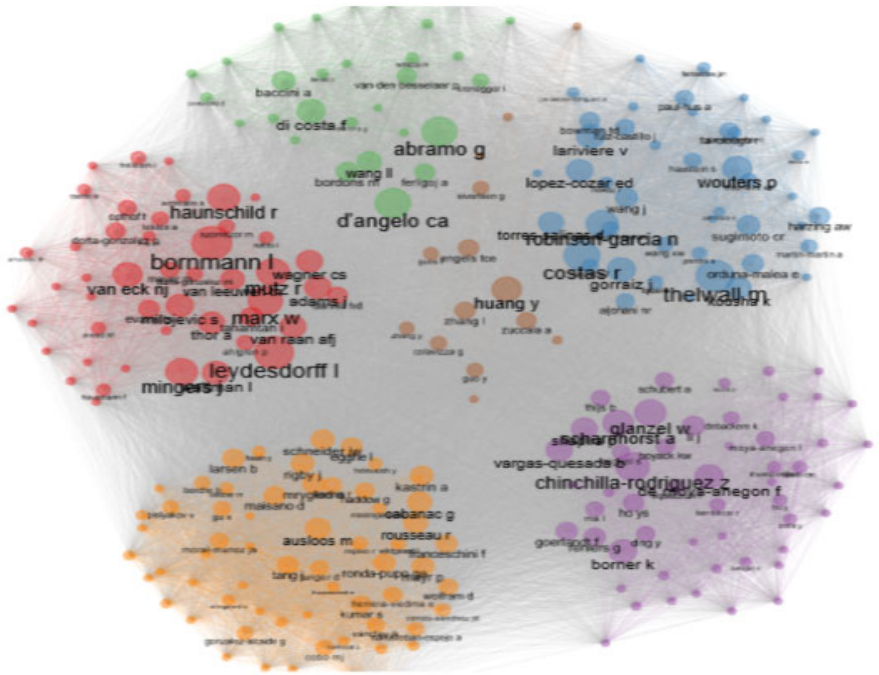



**Figure 4. Network visualization of authors' collaboration**

**Table 3. Top 10 most prolific countries**

| Sl. no | Name of the country | Number Publications | Total Citations | Average citations |
|---|---|---|---|---|
| **1** | China | 547 | 3253 | 5.96 |
| **2** | Spain | 504 | 4091 | 8.11 |
| **3** | USA | 500 | 4616 | 9.32 |
| **4** | Germany | 447 | 3029 | 6.77 |
| **5** | United Kingdom | 343 | 4786 | 13.95 |
| **6** | Netherlands | 333 | 9184 | 27.57 |
| **7** | Italy | 271 | 2177 | 8.03 |
| **8** | Belgium | 261 | 2978 | 11.40 |
| **9** | Brazil | 215 | 1154 | 5.36 |
| **10** | France | 188 | 887 | 4.71 |

The top 10 most productive countries are presented in Table 3. Accordingly, the China is the most productive country with the highest number of publications (547) and received 3253 citations followed by Spain (504) which received 4091 citations and USA (500) publications which received 4616 citations. These are the top three countries among the most productive countries. The table also reveals that France has published 188 articles and received 887 citations secured 10$^{th}$ position among the top ten most productive countries.

The Pearson correlation test has been applied to know the correlation between the publications of the top ten most productive countries and citations. The result indicates that there is a positive correlation (r =. 339) and the correlation is not significant (p = .337).

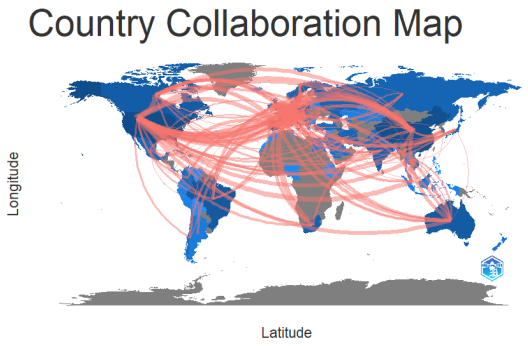



**Figure 5. A visualization map country collaboration**

**Table 4. Top 10 most productive journals**

| Sl. no | Name of the journal | Number Publications |
|---|---|---|
| **1** | Scientometrics | 1656 |
| **2** | Journal of Informetrics | 51 |
| **3** | International Journal of Environmental Research and Public Health | 26 |
| **4** | Sustainability | 25 |
| **5** | Journal of the Association for Information Science and Technology | 19 |
| **6** | IEEE Access | 14 |
| **7** | Anais Da Academia Brasileira De Ciencias | 12 |
| **8** | OrvosiHetilap | 11 |
| **9** | PLOS ONE | 11 |
| **10** | Revista Espanola De DocumentacionCientifica | 11 |

The top 10 most productive journals are presented in Table 4. The result shows that the journal *Scientometrics* is the most productive journal with the highest number of publications (1656) and followed by *Journal of Informetrics* (51) and *International Journal of Environmental Research and Public Health* (26) publications. These are the top three journals among the top ten most productive journals. The table also reveals that the *OrvosiHetilap*, *PLOS ONE* and *Revista Espanola De Documentacion Cientifica* are published 11 journals equally and secured top 8, 9 and $10^{th}$ positions respectively among the top ten most productive journals.

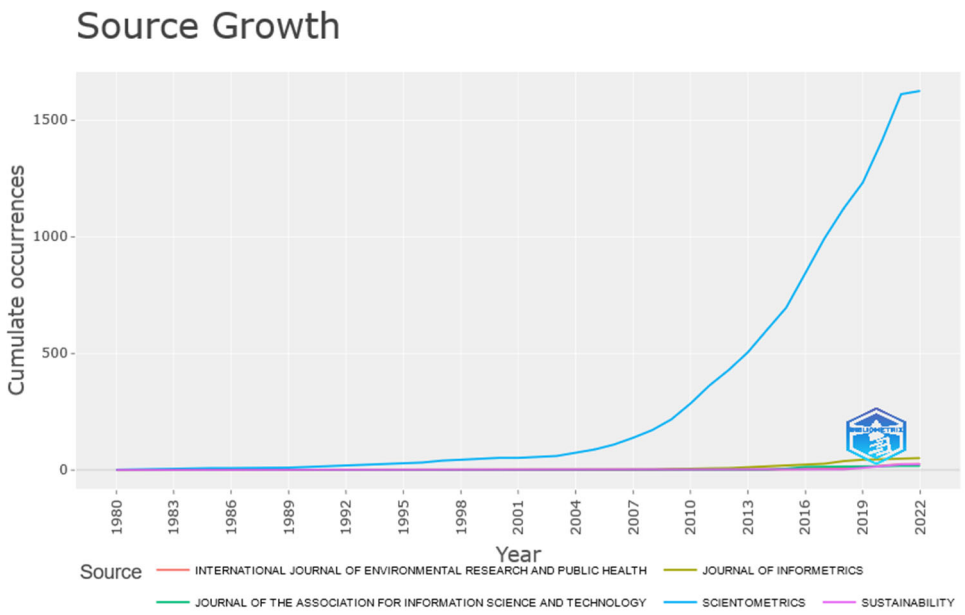



**Figure 6. Cumulate occurrences of open access publications on Scientometrics literature**

**Table 5. Top ten most productive institutions**

| Sl. No | Name of the Institutions | Articles |
|---|---|---|
| **1** | Leiden University Center Science& Technology Studies, Netherlands | 40 |
| **2** | ADM Headquarters Max Planck Division Science& Innovative StudiesHofgartenstr, Munich Germany | 31 |
| **3** | Max Planck Institute Solid State Research, Germany | 23 |
| **4** | University Amsterdam, Netherlands | 21 |
| **5** | Max Planck Gesell Division Science& Innovative Studies, Germany | 18 |
| **6** | Amsterdam Scholar Community Research, Netherlands | 18 |
| **7** | Georgia Institute of Technology, USA | 16 |
| **8** | Katholieke University Leuven Dept.Msi Louvain Belgium | 13 |
| **9** | Stellenbosch University Scientometrics & Science Technology, South Africa | 13 |
| **10** | University Hasselt B-3590 Diepenbeek, Belgium | 13 |

The top 10 most productive institutions are presented in Table 5. The table shows that the Leiden University Center Science& Technology Studies, Netherlands is the most productive institution with the highest number of publications (40) and followed by the ADM Headquarters, Max Planck Division Science& Innovative StudiesHofgartenstr, Munich Germany (31) and Max Planck Institute Solid State Research, Germany (23) publications. These are the top three institutions among the top ten most productive institutions. The table also reveals that the Katholieke University Leuven Dept.Msi Louvain, Belgium, Stellenbosch University Scientometrics & Science Technology, South Africa and University Hasselt B-3590 Diepenbeek, Belgium have published 13 documents each and secured 8, 9 and10$^{th}$ position among the top ten most productive institutions.

**Table 6. Top ten most cited documents**

| Sl. No | Paper | DOI | TC | TC per Year |
|---|---|---|---|---|
| **1** | Van Eck NJ, 2010, Scientometrics-a | 10.1007/s11192-009-0146-3 | 3075 | 236.53 |
| **2** | EggheL, 2006, Scientometrics-a-b | 10.1007/s11192-006-0144-7 | 1126 | 66.23 |
| **3** | Mongeon P, 2016, Scientometrics | 10.1007/s11192-015-1765-5 | 859 | 122.71 |
| **4** | Eysenbach G, 2011, J Med Internet Res | 10.2196/jmir.2012 | 625 | 52.08 |
| **5** | Fanelli D, 2012, Scientometrics | 10.1007/s11192-011-0494-7 | 541 | 49.18 |
| **6** | Harzing AW, 2016, Scientometrics-a | 10.1007/s11192-015-1798-9 | 501 | 71.57 |
| **7** | Larsen PO, 2010, Scientometrics | 10.1007/s11192-010-0202-z | 461 | 35.46 |
| **8** | Van Raan AFJ, 2006, Scientometrics | 10.1556/Scient.67.2006.3.10 | 403 | 23.70 |
| **9** | Martin-Martin A, 2018, J Informetr-a | 10.1016/j.joi.2018.09.002 | 383 | 76.6 |
| **10** | Glanzel W, 2002, Scientometrics | 10.1023/A:1014848323806 | 357 | 17 |

Table 6 shows the top ten most cited documents. It can be seen from the table that the paper written by Van Eck NJ, (2010) received 3075 citations followed by Egghe L, (2006) who received 1126 citations and Mongeon P, (2016) received 859 citations. These articles are top three among the top ten most cited articles. Table also indicates that an article written by Martin-Martin A, (2018) and Glanzel W, (2002) received 383 and 357 citations and secured 9th and 10th place respectively.

## Summary and conclusion

In this study, the growth of open access publications on Scientometrics by the global researchers/authors was identified. The result was based on the 2333 open access publications on Scientometrics which were retried from the Web of Science database. The result of the study shows that the exponential trend was found in the open-access publications on Scientometrics literatures and the $R^2$ value is 0.0161. The study was found that there is a positive correlation between the year and the number of articles (r=.816, p=.000) and correlation is significant at 0.01 level.

It was observed from the study that the majority 79.68% of the records were published in the form of articles followed by Proceedings papers (5.78%). The study revealed that the author Bornmann L has published 86, Leydesdorff L (66) and Thelwall M (51) documents and these authors are the most prolific authors among top ten authors with respect to number of publications, citations, h-index and g-index. The top three most productive countries were China 547 publications and received 3253 citations, Spain (504) which received 4091 citations and USA (500) publications which received 4616 citations. The Pearson correlation test result indicates that there is a positive correlation (r =. 339) and the correlation is not significant (p = .337).

The study was found that the journal *Scientometrics* was the most productive journal with the highest number of publications (1656), Leiden University Center Science & Technology Studies, Netherlands was the most productive institution with the highest (40) number of publications and the paper written by Van Eck NJ, (2010) was the most cited (3075 citations) documents.

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# Scientometric Analysis and Visualization of Research Trends of National Institute of Science Education and Research (NISER), Bhubaneswar, Odisha, India

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## Abstract

*The main aim of the present study was to analyze the contribution of NISER, Bhubaneswar's research outcome of over 3050 papers published and indexed in Web of Science (WoS) during 2008 to 2020 in the field of basic sciences. The study examined the year-wise growth and citation impact of research output, relative growth rate (RGR), doubling time (DT), most prolific authors, highly cited publications, and preferred journals for communication etc. by R-tool. observed that the annual growth rate of 217 was recorded highest in the year 2009, with the average citation per document being 25.73% and the mean citation count per year per document reported being 4.25% for the research contributions during this period. The maximum RGR of 1.43 and DT of 4.33 were recorded in 2009 and 2020, respectively. The most prolific author KIM, H. with 1147 publications (h-index 98) received 40654 citations and the Journal of High Energy Physics is known to be a widely preferred source by authors for publication. The study shows the visualization of bibliographic coupling patterns and analysis of keyword occurrence using VOS viewer software.*

***Keywords:*** *Research contribution, Scientometric analysis, NISER Bhubaneswar, and Visualization.*

## 1. Introduction:

Academic institutions have essential functions in teaching, learning, and research. The contribution in terms of their research contribution in institutional ranking has gained momentum in recent years in India. Publications under various disciplines can be extracted and analyzed with help of indexing and citation databases like

Scopus, PubMed, Dimension, ICI, Google Scholar, Web of Science and likewise. These databases encompass a wide range of articles that are used for citation analysis to demonstrate how research institutions are performing academically in terms of research publications.

Scientometrics refers to the analyses of scientific publications while examining trends and contributions to science. This is usually measured with help of various quantitative methods and factors. These account for the count of scientific articles published over a given period, their citation scores and impact factors, etc. These studies are proven to be fairly useful tools in quantifying measuring technological progress which cannot be directly accounted. Pradhan, B. (2020).

The National Institute of Science Education and Research (NISER), Bhubaneswar, an autonomous public research institution, was set up on 28th August 2006 by the Department of Atomic Energy, Government of India in Jatani (Khordha), Odisha, India. This institute is primarily known for providing high-quality education and infrastructure in basic science and research and is considered as one of India's leading institutes in research and ranked second in the nation by the Nature Research Index 2020.It is also ranked 14th in the university category and 30th ar overall in India by the National Institutional Ranking Framework (NIRF) in 2020. The Institute is an integral part of Homi Bhabha National Institute (HBNI), and thus the rank of HBNI is awarded to its constituent institutions as well (https://www.niser.ac.in/content/about). This study intends to analyze the productivity of NISER since its inception to evaluate and assess the research contributions and their impact.

## 2. Objectives of the study:

This study aims to:

1. To study the growth and citation impact of research publications
2. To identify the relative growth rate (RGR) and doubling time (DT) of publications
3. To identify the most prolific author and its citation patterns
4. To study highly cited research papers, preferred sources and impact
5. To visualize of bibliographic coupling analysis of publications, and source
6. To the analysis of co-citation patterns of source and keyword occurrence

## 3. Materials and Methods:

Through the scientometric analysis, research performance is a vital factor noted by accreditation agencies to identify higher education institutes based on productivity. The overall research outcome of institutions as well as the impact of individual researcher's contribution primarily forms the basis of performance evaluation for the accreditation agencies (Pradhan et al., 2020)[10]. This study primarily aims to analyze the research publication outcome of NISER Bhubaneswar published over the years 2008-2020. The authors have obtained publication data from a well-known bibliographic database, WoS (A product of Clarivate Analytics). It is one of the global leaders and largest abstracting and citation databases of peer-reviewed literature. This advanced search strategy has been used in the WoS database, a total of 3050 publications data was retrieved and downloaded into BibTeX format and processed for data cleaning. On 26th May 2021, the search string used for extracting data was "Organization Enhanced OG=(National Institute of Science Education & Research (NISER) and PY =2008-2020." **Indexes:** SCI-EXPANDED, BKCI-S, SSCIBKCI-SSH, ESCI, A&HCI, CPCI-S, CPCI-SSH. Finally, it was scrutinized with the help of scientific tools and techniques such as the bibliometrix package of 'R' environment (Aria & Cuccurullo, 2017)**[11]** and the visualized network of it using *VOSviewer* to analyze the achievement of the study objectives.

## 4. Analysis and Discussion

Different parameters related to the study were selected for the analysis. The parameters like the growth of publication and citation patterns, relative growth rates of publications and doubling time, most productive author, distributions of types of documents, highly cited research papers, preferred sources and impact. The following sections briefly describe and interpret the research result.

### 4.1 Trends of research output and citations impact

Research publications are considered an important parameter in the ranking of institutions, in addition to infrastructure, faculty, students, and other variables. Table 1 reveals that NISER Bhubaneswar published 3050 publications across all disciplines during 2008-2020. Data shows year-wise growth with their citations as 2642 papers are cited for a total of 71314 times, with an average citation per paper being 25.73. The steady growth of research publications is observed over time, out of which 86.62% (2641) of publications were cited and the remaining 13.37% (408) of papers did not receive any citation. In 2009, a maximum of 217 AGR, followed by 185 AGR in 2013 and a minimum -14 AGR was reported in 2020. The growth

was evaluated by following the AGR expression given by (Santha Kumar & Kaliyaperumal, 2015)[12]

$$AGR = \frac{FinalValue - StartValue}{StartValue} X100$$

**Table 1. Year Wise Annual Growth of Publication and Citation Patterns**

| Publication Year | No. of Articles | AGR (in %) | Cited Pub. | Non-Cited Pub. | No. of Citation Received | ACPP | ACPY | Citable Years |
|---|---|---|---|---|---|---|---|---|
| **2008** | 6 | 100 | 6 | 0 | 166 | 27.67 | 2.13 | 13 |
| **2009** | 19 | 217 | 15 | 4 | 178 | 9.37 | 0.78 | 12 |
| **2010** | 27 | 42 | 26 | 1 | 431 | 15.96 | 1.45 | 11 |
| **2011** | 30 | 11 | 26 | 4 | 469 | 15.63 | 1.56 | 10 |
| **2012** | 54 | 80 | 47 | 7 | 2318 | 42.93 | 4.77 | 9 |
| **2013** | 154 | 185 | 145 | 9 | 8410 | 54.61 | 6.83 | 8 |
| **2014** | 337 | 119 | 329 | 8 | 19179 | 56.91 | 8.13 | 7 |
| **2015** | 307 | -9 | 291 | 16 | 13235 | 43.11 | 7.19 | 6 |
| **2016** | 330 | 7 | 309 | 21 | 7433 | 22.52 | 4.50 | 5 |
| **2017** | 378 | 15 | 343 | 35 | 7787 | 20.60 | 5.15 | 4 |
| **2018** | 446 | 18 | 399 | 47 | 6241 | 13.99 | 4.66 | 3 |
| **2019** | 516 | 16 | 423 | 93 | 3226 | 6.25 | 3.13 | 2 |
| **2020** | 446 | -14 | 283 | 163 | 2241 | 5.02 | 5.02 | 1 |
| **Total** | **3050** | | | **408** | **71314** | | | |

## 4.2 Relative Growth Rates of Publications and Doubling Time

Table 2 and Fig. 1 depict the relative increase in research manuscripts published by NISER in different types of sources during this period. There is a sudden rise in publications during 2009, 2013, 2014. The maximum 1.437 RGR was recorded in 2009, followed by 0.77, 0.76 in 2014 and 2013 respectively. It is evident from this figure that the growth rate has decreased during this period. The growth rate of all publications was accounted for based on the RGR and Dt. Model (Mahapatra, 1994)[13] RGR is calculated to analyze the increments in the publication count on time and Dt. is directly related to RGR.

The relative growth rate (RGR) refers to the increase in the number of publications per page per unit time. Consequently, the relative growth rate R(1-2) over a particular period can be evaluated from the following expression.

$$RGR = \frac{W_2 - W_1}{T_2 - T_1}$$

Where R= Mean relative growth rate over a specific period of the interval;

$W_1$= Log $W_1$ (Natural log of the initial number of publications);

$W_2$= Log $W_2$ (Natural log of the initial number of publications/pages);

$T_2$=$T_1$= Unit difference between the initial time and final time.

So, $R_{(a)}$ refers to Relative Growth Rate per unit of publications per unit of time (year) and $R_{(p)}$refers to Relative Growth Rate per unit of pages per unit of time (year)

**Table 2. Relative Growth Rates of Publications and Doubling Time**

| Publication Year | TP | Cumulative Sum | $W_1$ | $W_2$ | RGR | Doubling Time |
|---|---|---|---|---|---|---|
| **2008** | 6 | 6 | - | 1.79 | - | - |
| **2009** | 19 | 25 | 1.79 | 3.22 | 1.43 | 0.48 |
| **2010** | 27 | 52 | 3.22 | 3.95 | 0.73 | 0.95 |
| **2011** | 30 | 82 | 3.95 | 4.41 | 0.46 | 1.51 |
| **2012** | 54 | 136 | 4.41 | 4.91 | 0.5 | 1.39 |
| **2013** | 154 | 290 | 4.91 | 5.67 | 0.76 | 0.91 |
| **2014** | 337 | 627 | 5.67 | 6.44 | 0.77 | 0.9 |
| **2015** | 307 | 934 | 6.44 | 6.84 | 0.4 | 1.73 |
| **2016** | 330 | 1264 | 6.84 | 7.14 | 0.3 | 2.31 |
| **2017** | 378 | 1642 | 7.14 | 7.4 | 0.26 | 2.67 |
| **2018** | 446 | 2088 | 7.4 | 7.64 | 0.24 | 2.89 |
| **2019** | 516 | 2604 | 7.64 | 7.86 | 0.22 | 3.15 |
| **2020** | 446 | 3050 | 7.86 | 8.02 | 0.16 | 4.33 |

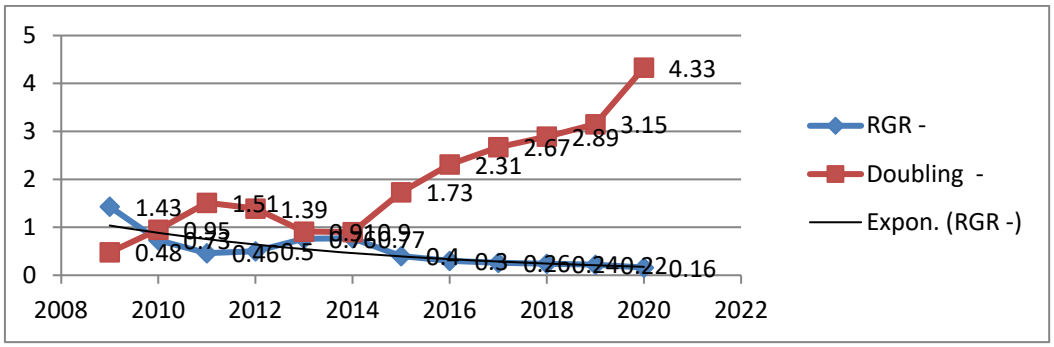



**Figure 1. Relative Growth Rates of Publications and Doubling Time**

### 4.3 Most Prolific Authors

Table 3. illustrates that Kim, H. received the highest number of citations (1147 articles), followed by Das, S. (1138 articles) and Weber, M. (1039 articles) analyzed result as per the R-bibliometrix tool.

**Table 3. Most Prolific Author**

| Sr. No. | Name of Author | TP | TC | h-Index | ACPP |
|---|---|---|---|---|---|
| **1** | Kim, H | 1147 | 40654 | 98 | 35.44 |
| **2** | Das, S. | 1138 | 38550 | 92 | 33.88 |
| **3** | Weber, M | 1039 | 35362 | 90 | 34.03 |
| **4** | Sharma, A | 1035 | 31487 | 84 | 30.42 |
| **5** | Kumar, S | 1002 | 29616 | 80 | 29.56 |
| **6** | Wang, F | 996 | 37473 | 95 | 37.62 |
| **7** | Lee, S | 990 | 30351 | 82 | 30.66 |
| **8** | Zhang, J | 980 | 38052 | 97 | 38.83 |
| **9** | Choudhury, S | 921 | 34226 | 90 | 37.16 |
| **10** | May, Y | 921 | 29140 | 80 | 31.64 |

### 4.4 Highly cited papers

The evaluation of research using their citations is an important yardstick of its impact. It indicates scientific excellence and recognition of institutions. Out of 3050 publications indexed in WoS, we examined the top ten widely cited publications given in Table 4 that depicts the list of top 10 papers which were cited

by other scholars. The title 'AAD G, 2015, Combined Measurement of the Higgs Boson Mass in pp Collisions at $\sqrt{s}$=7 and 8 TeV with the ATLAS and CMS Experiments' written by author name in the journals 'PHYS REV LETT' in 2015 got the first rank with 936 citations (total citation per year 133.71) followed by a paper entitled 'Applications of Acceptor less Dehydrogenation and Related Transformations in Chemical Synthesis' written by Gunanathan, Chidambaram and Milstein, David published in the journal Science in 2013 with citation 823 (total citation per year 91.44) got 2nd rank and the article 'Planck 2018 results. VI. Cosmological parameters' written by Aghanim, N. et.al. in the journal Astronomy and Astrophysics in 2020 with 776 citations (total citation per year 388.00) got rank 3 and so on.

**Table 4. Highly Cited Papers**

| Title | Author | Source | Year of Pub. | Total Citations | Total Citations Per Year | Rank |
|---|---|---|---|---|---|---|
| Combined Measurement of the Higgs Boson Mass in pp Collisions at $\sqrt{s}$=7 and 8 TeV with the ATLAS and CMS Experiments | Aad, G. et al. | Physical Review Letters | 2015 | 936 | 133.71 | 1 |
| Applications of Accept or less Dehydrogenation and Related Transformations in Chemical Synthesis | Gunanathan, Chidambaram and Milstein, David | Science | 2013 | 823 | 91.44 | 2 |
| Planck 2018 results. VI. Cosmological parameters | Aghanim, N. et.al. | Astronomy and Astrophysics | 2020 | 776 | 388.00 | 3 |
| Oxidative stress: an essential factor in the pathogenesis of gastrointestinal mucosal diseases | Bhattacharyya, Asima, Chattopadhyay, Ranajoy, Mitra, Sankar, and Crowe, Sheila E. | Physiological Reviews | 2014 | 772 | 96.50 | 4 |
| Poly-ϵ-caprolactone based formulations for drug delivery and tissue engineering: A review | Dash, Tapan K., Badireenath, V. Konkimalla | Journal of Controlled Release | 2012 | 608 | 60.80 | 5 |
| Measurements of the Higgs boson production and decay rates and constraints on its couplings from a combined ATLAS and CMS analysis of the LHC pp collision data at $\sqrt{s}$=7 and 8 TeV | Aad, G., Abbott, B. et al. | Journal of High Energy Physics | 2016 | 585 | 97.50 | 6 |
| Bond Activation and Catalysis by Ruthenium Pincer Complexes | Gunanathan, Chidambaram and Milstein, David | Chemical Reviews | 2014 | 554 | 69.25 | 7 |
| Precise determination of the mass of the Higgs boson and tests of compatibility of its couplings with the standard model predictions using proton collisions at 7 and 8TeV. | Khachatryan, V., Sirunyan, A.M., Tumasyan, A. et al. | The European Physical Journal C | 2015 | 446 | 63.71 | 8 |
| Centrality dependence of π, K, and p production in Pb-Pb collisions at $\sqrt{sNN}$=2.76 TeV | Abelev, B. et al. | Physical Review C | 2013 | 414 | 46.00 | 9 |
| Measurement of the properties of a Higgs boson in the four-lepton final state | Chatrchyan, S et al. | Physical Review D | 2014 | 390 | 48.75 | 10 |

## 4.5 Most Preferred Source

The data extracted for the study indicated that the 3050 publications published by NISER faculty and Research scholars were scattered in various national and international journals over the 13 years (2008 to 2020). We have taken the top ten preferred journals where NISER authors mostly preferred to publish their research work. The highest number 2706 (88.721%) they were articles published during this period. Among these journals, 'Journal of High Energy Physics' (IF is 5.875) was the topmost preferred journal with 374 articles in the 1st position and received the highest number of 11182 citations followed by 'Physics Letters B' (IF is 4.384) with 291 articles in 2nd position received 10626 citations, and 'European Physical Journal C' (IF is 4.389) with 198 articles in 3rd position received 7783 citations and so on.

The m-index is being calculated to find out the impact of the source over 13 years and it's based on the h-index for that year and divided by the citable year. The European Physical Journal C has received a maximum m-Index of 4.89. The g-Index is a metric that is being used to calculate the distribution of citations received by researchers' publications. The Journal of High Physics has received the highest g-Index of 92. The distribution of publications in these top 10 journals by Individuals is shown in Table 5

**Table 5. Most preferred sources**

| Sources | Year of First Article | No. of Articles | IF(2020) | No of Citations | h-Index | g-Index | m-Index |
|---|---|---|---|---|---|---|---|
| **Journal of High Energy Physics** | 2009 | 374 | 5.875 | 11182 | 57 | 92 | 4.38 |
| **Physics Letters B** | 2008 | 291 | 4.384 | 10626 | 59 | 87 | 4.21 |
| **European Physical Journal C** | 2013 | 198 | 4.389 | 7783 | 44 | 80 | 4.89 |
| **Physical Review D** | 2008 | 168 | 4.833 | 5149 | 36 | 67 | 2.57 |
| **Physical Review Letters** | 2013 | 143 | 8.385 | 7385 | 48 | 83 | 5.33 |

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| **Physical Review C** | 2012 | 127 | 2.988 | 4211 | 35 | 62 | 3.50 |
| **Nuclear Physics A** | 2014 | 77 | 1.695 | 323 | 10 | 14 | 1.25 |
| **Dalton Transactions** | 2014 | 44 | 4.174 | 557 | 14 | 21 | 1.75 |
| **Journal of Instrumentation** | 2012 | 41 | 1.454 | 2580 | 15 | 33 | 1.50 |
| **Physical Chemistry Chemical Physics** | 2010 | 36 | 3.430 | 334 | 12 | 15 | 1.00 |

### 4.6 Distribution of Types of Documents

During the 13 years (2008–2020) NISER, Bhubaneswar researchers have produced 3050 research in the form of articles, reviews, proceedings, book chapters, meeting abstracts, corrections, editorial materials and the like. The highest numbers of publications, 2706 (88.72%) were research articles followed by proceeding papers type of documents with 92 (3.01%) and remaining are other publication. The details of various kinds of documents published by this Institute are given in figure 2.

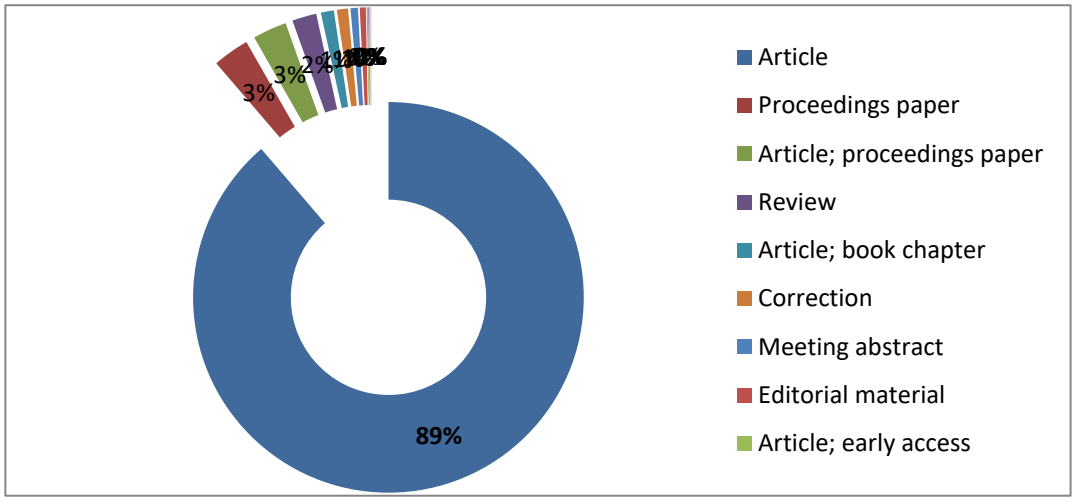



**Figure 2. Distribution of Types of Documents**

## 4.7 Multiple Correspondence (Co-word) Analyses:

Multiple correspondence analyses are one of the techniques for co-word analysis. 6006 keywords were extracted from 3050 publications. Top 50 keywords plus were generated shown in Figure 2 to generate the conceptual structure map of the concepts used in the study. The research trend is a vital element in understanding the thematic expression of the research domain. The data analysis shows that a network of significant keywords merged into broader subject disciplines. The topic tree map shows that the relationships between narrow homogeneous keywords and as a consequence of which, only 50 keywords were retained for the co-word analysis that appeared with the highest frequency. Some keywords indicated that the issues which were getting increasing attention in the research like as model(184), quark-gluon plasma(117), patron distributions(102), perspective(95), complexes(95), pp collisions(88), dependence(85), mass(80), transverse-momentum(76), extension(71), collisions(70), and so on.

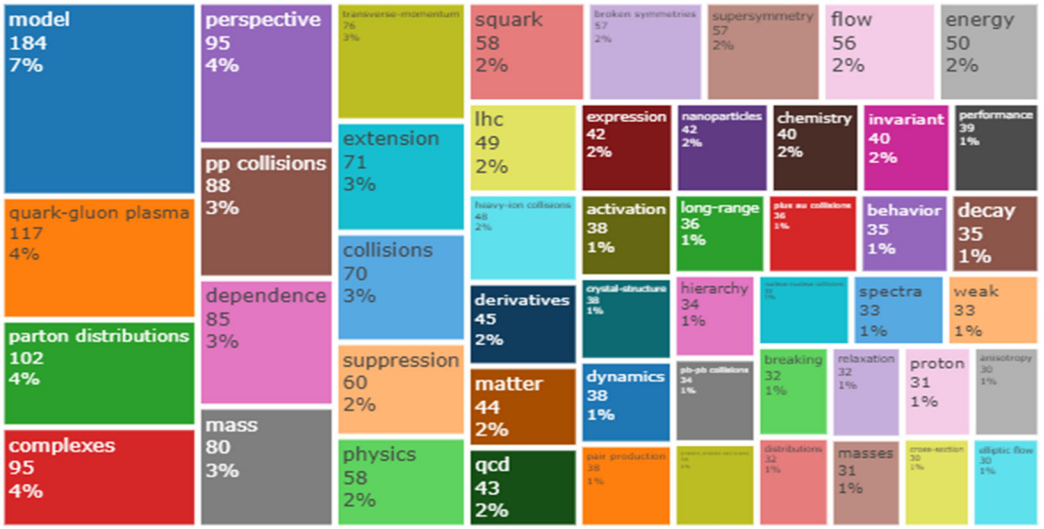



**Figure 3. Network of keywords with highest frequency**

## 4.8 Global Collaboration Network

It is very important to note that the contribution of Indian authors is acknowledged globally. Researchers of NISER Bhubaneswar have collaborated with foreign researchers across the world. Figure 4 shows the significant collaborative research work by the Indian research scholars covered under the study, with countries such as the USA, China, Germany, Russia, UK and France and the like. Figure 4 reflects

the geographical map with a curve line graph reflecting the rank wise collaborations among two countries according to international collaborations according to the author address.

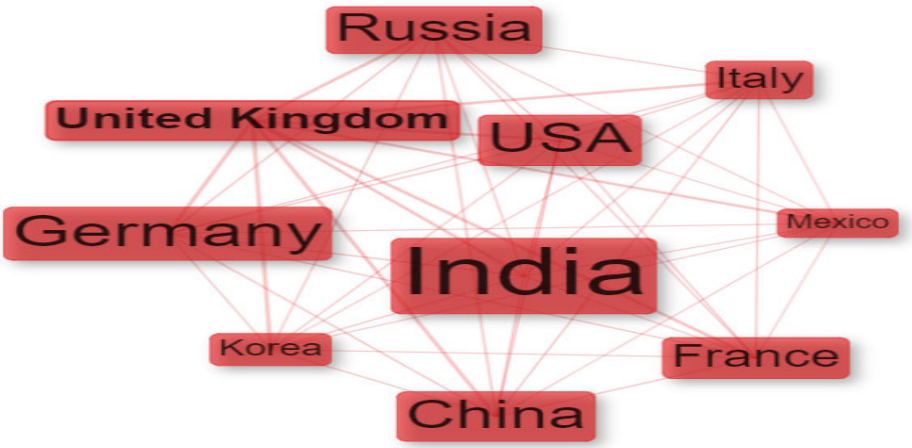



**Figure 4. Collaboration Network of Countries**

## 4.9 Bibliographic coupling analysis

The term bibliographic coupling refers to the link between objects that measures the basis of the number of references that are in common. The amount of their relatedness increases when a document receives more citations. It indicates the similarities of the two works under consideration, the subject matter in the form of publications, organization, source, authors as well as the countries

**Table 6: Most influential publications of bibliographic coupling analysis**

| Sr. No. | Document | Citations | Total link strength |
|---|---|---|---|
| 1 | aad g;abbott b;abdallah j;khalek o;aben r;abi b;abolins m;abouzeid | 143 | 3993 |
| 2 | khachatryan v;sirunyan am;tumasyan a;adam t;dragicevic m;eroe j;f | 102 | 3860 |
| 3 | chatrchyan s;khachatryan v;sirunyan am;tumasyan a;adam w;bergau | 390 | 3639 |
| 4 | aad g;abbott b;abdallah j;khalek o;aben r;abi b;abolins m;abouzeid | 74 | 3298 |
| 5 | khachatryan v;sirunyan am;tumasyan a;adam t;dragicevic m;eroe j;f | 150 | 3286 |
| 6 | khachatryan v;sirunyan am;tumasyan a;adam t;dragicevic m;eroe j;f | 446 | 3231 |
| 7 | aad g;abbott b;abdallah j;khalek o;aben r;abi b;abolins m;abouzeid | 179 | 3178 |
| 8 | aad g;abbott b;abdallah j;khalek o;aben r;abi b;abolins m;abouzeid | 132 | 3160 |
| 9 | chatrchyan s;khachatryan v;sirunyan am;tumasyan a;adam w;bergau | 226 | 3159 |
| 10 | khachatryan v;sirunyan am;tumasyan a;adam t;dragicevic m;eroe j;f | 276 | 3005 |

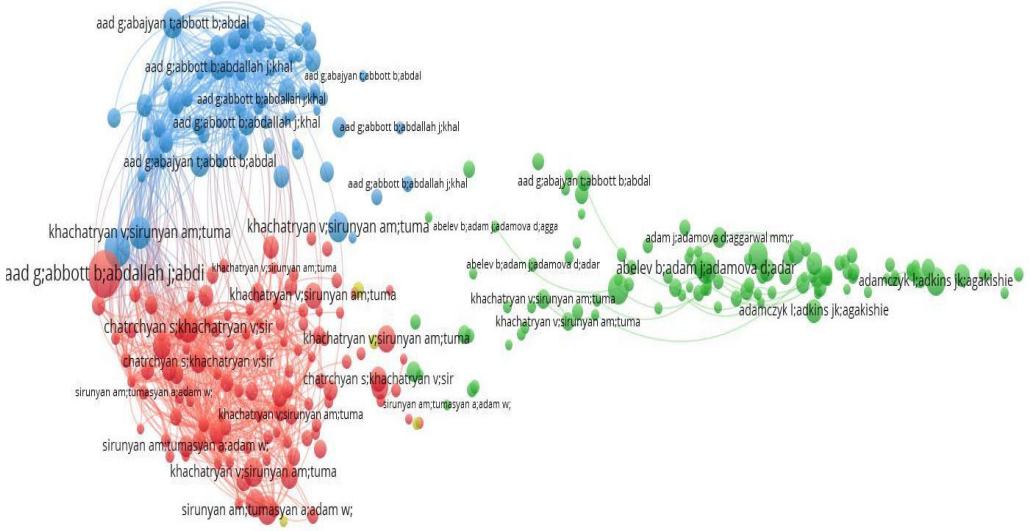



**Figure 5. Bibliographic coupling analysis of publications**

Figure 5 illustrates the correlation between the publications and the strength of the work. Research and publishing of the same topic indicate the dynamic of research statements from different perspectives. The area under multiple coloured bubbles and their overlap indicates the strength/density of similarity of complex research publications of NISER, Bhubaneswar.

**Table 7. The most influencing journals of bibliographic coupling analysis**

| Sr. No. | Source | Documents | Citations | Total link strength |
|---|---|---|---|---|
| **1** | Journal of high energy physics | 374 | 11182 | 1220383 |
| **2** | Physics letters b | 291 | 10626 | 892274 |
| **3** | European physical journal c | 198 | 7783 | 741754 |
| **4** | Physical review d | 168 | 5149 | 669545 |
| **5** | Physical review letters | 143 | 7385 | 401012 |
| **6** | Physical review c | 127 | 4211 | 117345 |
| **7** | Journal of instrumentation | 41 | 2580 | 112889 |
| **8** | Nuclear physics a | 77 | 323 | 32360 |

| | | | | |
|---|---|---|---|---|
| **9** | Journal of physics g-nuclear and particle physics | 13 | 255 | 6725 |
| **10** | Dalton transactions | 44 | 557 | 6426 |

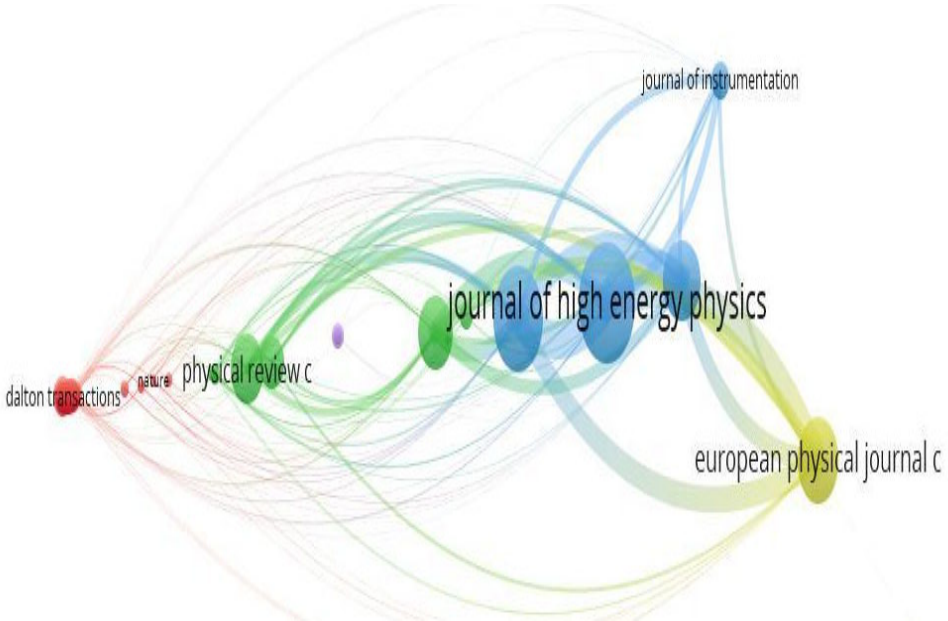



**Figure 6. Bibliographic coupling network of journals**

A co-citation network map for the analysis of 43 journals with a minimum of 200 citations that were presented. Figure 5 depicts the significantly influencing journals which are having total strength links as per the citations. The top ten journals are shown in the above figure, the co-citation analysis of the prerequisite and influencing journals where NISER authors published most of the publications and received the highest number of citations. The first 3 ranking journals are showing Journal of high energy physics (TP=374, TC=11182 and TLS=1220383), followed by Physics letters b (TP=291, TC=10626 and TLS=892274) and European physical journal c (TP=1981, TC=7783 and TLS=741754) and so on.

## 4.10 Co-citation Analysis

**Table 8. Co-citation analysis of Publications**

| Sr. No. | Document | Citations | links |
|---|---|---|---|
| 1 | chatrchyan s;khachatryan v;sirunyan am;tumasyan a;ad | 390 | 21 |
| 2 | aad g;abajyan t;abbott b;abdallah j;khalek sa;abdinov c | 362 | 21 |
| 3 | khachatryan v;sirunyan am;tumasyan a;adam t;dragicev | 446 | 20 |
| 4 | aad g;abajyan t;abbott b;abdallah jj;khalek sa;abdinov | 347 | 19 |
| 5 | khachatryan v;sirunyan am;tumasyan a;adam t;dragicev | 276 | 18 |
| 6 | sirunyan am;tumasyan a;adam w;ambrogi e;bergauer t | 150 | 15 |
| 7 | aad g;abbott b;abdallah j;khalek o;aben r;abi b;abolins | 179 | 14 |
| 8 | aad g;abbott b;abdallah j;khalek o;aben r;abi b;abidi sh | 162 | 14 |
| 9 | chatrchyan s;khachatryan v;sirunyan am;tumasyan a;ad | 117 | 14 |
| 10 | khachatryan v;sirunyan am;tumasyan a;adam e;bergau | 138 | 13 |
| 11 | khachatryan v;sirunyan am;tumasyan a;adam t;dragicev | 194 | 13 |
| 12 | chatrchyan s;khachatryan v;sirunyan am;tumasyan a;ad | 226 | 13 |
| 13 | sirunyan am;tumasyan a;adam w;asilar t;brandstetter j | 348 | 12 |
| 14 | aad g;abajyan t;abbott b;abdallah j;khalek sa;abdinov c | 186 | 12 |
| 15 | aad g;abbott b;abdallah j;khalek o;aben r;abi b;abolins | 218 | 12 |
| 16 | chatrchyan s;khachatryan v;sirunyan am;tumasyan a;ad | 263 | 12 |
| 17 | khachatryan v;sirunyan am;tumasyan a;adam e;bergau | 333 | 11 |
| 18 | chatrchyan s;khachatryan v;sirunyan am;tumasyan a;ad | 202 | 11 |
| 19 | abelev b;adam j;adamova d;adare am;aggarwal mm;rin | 240 | 11 |
| 20 | aad g;abbott b;abdallah j;khalek o;aben r;abi b;abolins | 140 | 10 |

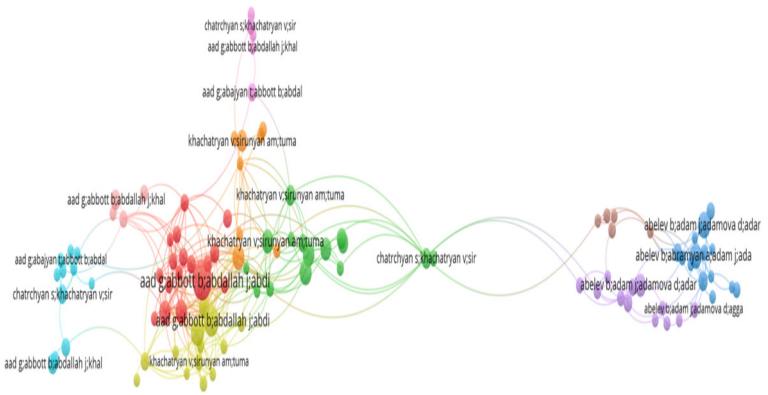



**Figure 7. Co-citation analysis of publications**

Figure 7 shows visualizing the gravity in co-citations among the document citations and its total link strength. A total of 496 documents were selected, which meets the threshold out of 10384 sources during 2008-2020. Above this, connecting threads and co-citation figure nodes (20) illustrate the density in likeness and bond in published research with its co-occurrences.

## 5. Conclusions

The present study revealed that the overall trend of growth in scholarly output of NISER, Bhubaneswar has been identified with a total of 3050 research output in the field of basic sciences over 13 years (2008 to 2020). Further, 3050 articles are examined and analyzed and it is found that the annual growth rate of an average of 60.53%. A total of 71314 citations have been made with an average of 25.71% citations per paper and an average citation per year as 4.25. The totals of 34770 authors have contributed to 3050 publications with an average of 11.04 authors per paper and 0.0877 is the productivity per author. The most prolific author KIM, H. during the period of study with 1147 (3.27.02%) contributions stood at 1st place. 2706 (88.72%) number of documents were published in the form of articles. The maximum 1.437 RGR was found in 2009, followed by 0.77, 0.76 in 2014, 2013 respectively and Journal of High Energy Physics'(IF is 5.875) was the topmost preferred journal with 374 articles is in the 1st position received 11182 citations with the highest g-Index of 92 from where researchers published. However, the findings also show that NISER, Bhubaneswar researchers are more likely to collaborate with authors from the US, Germany, UK, China, Russia, etc., which indicates that the Institute should increase their research work in the field of basic sciences and promote open access trend to get more citations of the publications as it is an premier autonomous public research institute in India. This study enlightens the research productivity and visualization trend of NISER's fraternity. Though this has been a relatively short study, there is a need to carry out an in-depth bibliometric study in the coming years to examine NISER's research productivity.

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# Ranking and Scattering of Journals in Open Access 'Journal of Library and Information Studies': A Quantitative Analysis

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**Abstract**

*The present study is based on 5359 citations appended to 123 issues of 10 volumes of Journal of Library and Information Studies. The span of 10 years has been taken into the consideration from 2011 (Vol. 9) to 2020 (Vol.18). The data was analyzed by using various parameters which is presented in the form of tables. It has been carried out bibliographic form-wise distribution of citations, ranked list of journals, productivity of journals, and Bradford's zones of the citations. Journals contribute the highest number of citations compared to other bibliographic sources. The journal 'Scientometrics' occupies first rank for being cited more number of times with 4.01 percent of total citations.*

**Keywords:** *Bibliometrics, Citation analysis, Scientometrics, Open Access, Ranking of Journals*

## 1. Introduction

Citation analysis is a bibliometrics technique that examines how people use the material. It is a crucial research tool for comprehending the subject, since it allows us to examine the structure and direction of the subject. It assesses the usefulness of documents as well as the link between the author and the document. This is a straightforward approach of analyzing library records to identify how documents are actually used. This type of research is useful in

resolving a variety of difficulties related to the acquisition of significant documents as well as general management issues such as space and budget allocation, user customization of information services, and so on.

Bibliometrics is an emerging thrust research area of library and information science and deals with the quantitative study of documents. The term 'Bibliometrics' was coined by Alan Pritchard (1969) and defined as 'the application of mathematics and statistical methods to books and to media of communication'. This study is an attempt to understand the various aspects of Library and Information Studies literature quantitatively.

Journal of Library and Information Studies is an open access journal published semi-annually by the Department of Library and Information science of the National Taiwan University. This journal formerly known as the National Taiwan University Journal of Library Science started in the year 1967 and it was first scholarly journal for library science researchers in Taiwan. The journal was renamed in 1999 in order to represent the expanding scope and diverse interests in the current library and information communities. JLIS is the best scholarly journals in the Chinese speaking world. IJLIS is a forerunner of open access journals. In 1997 it began to make its content freely available via the Internet. At present the journal is published simultaneously in print and electronic formats and is archived in the National Taiwan University Journal Database for permanent preservation and public access.

## 2. Objectives of the Study

The objectives of the present study are:

- to know the distribution of citations in different bibliographic forms;
- to examine the ranking and scattering of journals;
- to find out the productivity of journals in Current Science; and
- to know the Bradford's zones of the journals citations.

## 3. Materials and Methods

Journal of Library and Information Studies is published semi-annually by the National Taiwan University; it is the best scholarly journals in the Chinese speaking world. It was started in the year 1967 and it was first scholarly journal for library science researchers in Taiwan. The journal was renamed in 1999 in order to represent the expanding scope and diverse interests in the current library and information communities. The study is based on 5359 citations appended to 20 issues of 10 volumes of Journal of Library and Information

Studies. The span of 10 years has been taken into the consideration from 2011 (vol.9) to 2020 (Vol.19). The data was analyzed by using various parameters which is presented in the form of tables. The present study adopted quantitative method. The method is very old and popularly known in all human societies. Present day it is widely used. The present study entitled "Ranking and Scattering of Journals in Journal of Library and Information Studies during 2011 to 2020. The data was collected from the bibliographical entries listed at the end of the article. The citations were downloaded from the journal archives of the source journal. The analysis was done by using various parameters laid down in objectives of the study.

## 4. Data analysis

### 4.1 Bibliographic forms

Table 1 shows the distribution of citations according to the different bibliographic forms in source journal.

**Table 1: Bibliographic forms in source journal**

| Bibliographic forms | Number | Percentage |
|---|---|---|
| Books | 992 | 18.51 |
| Journals | 2393 | 44.65 |
| Conference/seminar proceeding | 1077 | 20.10 |
| Reports | 156 | 2.91 |
| Theses/dissertations | 263 | 4.91 |
| Web Resources | 409 | 7.63 |
| Others | 69 | 1.29 |
| **Total** | **5359** | **100.00** |

It is evident from the Table 1 that journals contribute the highest number of citations, accounting for 44.65 percent of the total citations. Conference/seminar proceedings secured the second highest number of citations, accounting for 20.10 percent of the total citations, followed by books (18.51%), web resources (7.63%), theses/dissertations (4.91%), reports (2.91%). The remaining 1.29 percent of citations is found in other bibliographic forms.

### 4.2 Ranked list of journals in source journal

Table 2 shows that the ranking of journals as per the distribution of citations of articles in source journal

**Table 2: Ranked list of journals in source journal**

| S.No | Name of the Journal | Number | Percentage | Cumulative Number | Cumulative Percentage |
|---|---|---|---|---|---|
| 1 | Scientometrics | 96 | 4.011701 | 96 | 4.011701 |
| 2 | Journal of the American Society for Information Science & Technology | 62 | 2.59089 | 158 | 6.602591 |
| 3 | Journal of Library and Information Studies | 41 | 1.713331 | 199 | 8.315922 |
| 4 | Journal of Documentation | 38 | 1.587965 | 237 | 9.903887 |
| 5 | Information Processing and Management | 30 | 1.253656 | 267 | 11.15754 |
| 6 | Journal of Educational Media and Library Sciences | 27 | 1.128291 | 294 | 12.28583 |
| 7 | Library Trends | 27 | 1.128291 | 321 | 13.41412 |
| 8 | Bulletin of the Taipei Public Library Quarterly | 23 | 0.961137 | 344 | 14.37526 |
| 9 | Journal of Informetrics | 23 | 0.961137 | 367 | 15.3364 |
| 10 | Journal of the American Society for Information Science | 22 | 0.919348 | 389 | 16.25575 |
| 11 | Research Policy | 22 | 0.919348 | 411 | 17.17509 |
| 12 | Aslib Proceedings: New Information Perspectives | 19 | 0.793982 | 430 | 17.96908 |

| | | | | | |
|---|---|---|---|---|---|
| 13 | College and Research Libraries | 19 | 0.793982 | 449 | 18.76306 |
| 14 | Information Research: An International Electronic Journal | 19 | 0.793982 | 468 | 19.55704 |
| 15 | Library & Information Science Research | 18 | 0.752194 | 486 | 20.30924 |
| 16 | Journal of the Association for Information Science and Technology | 17 | 0.710405 | 503 | 21.01964 |
| 17 | Bulletin of the Library Association of China | 16 | 0.668617 | 519 | 21.68826 |
| 18 | Journal of Library and Information Science Research | 15 | 0.626828 | 534 | 22.31509 |
| 19 | Research Evaluation | 14 | 0.58504 | 548 | 22.90013 |
| 20 | Journal of Information Science | 12 | 0.501463 | 560 | 23.40159 |
| 21 | Journal of the American Dietetic Association | 12 | 0.501463 | 572 | 23.90305 |
| 22 | Proceedings of the Association for Information Science and Technology | 12 | 0.501463 | 584 | 24.40451 |
| 23 | The Electronic Library | 12 | 0.501463 | 596 | 24.90598 |
| 24 | Bulletin of Library and Information Science | 11 | 0.459674 | 607 | 25.36565 |

| | | | | | |
|---|---|---|---|---|---|
| 25 | Nature | 11 | 0.459674 | 618 | 25.82533 |
| 26 | Cataloging & Classification Quarterly | 10 | 0.417885 | 628 | 26.24321 |
| 27 | English for Specific Purposes | 10 | 0.417885 | 638 | 26.6611 |
| 28 | Journal of Librarianship and Information Studies | 10 | 0.417885 | 648 | 27.07898 |
| 29 | Journal of Library Administration | 10 | 0.417885 | 658 | 27.49687 |
| 30 | Journal of Library and Information Science | 10 | 0.417885 | 668 | 27.91475 |
| 31 | Library Quarterly | 10 | 0.417885 | 678 | 28.33264 |
| 32 | PloS ONE | 10 | 0.417885 | 688 | 28.75052 |
| 33 | Science | 10 | 0.417885 | 698 | 29.16841 |
| 34 | Annual Review of Information Science and Technology | 9 | 0.376097 | 707 | 29.5445 |
| 35 | Harvard Business Review | 9 | 0.376097 | 716 | 29.9206 |
| 36 | Journal of Marketing | 9 | 0.376097 | 725 | 30.2967 |
| 37 | Library Hi Tech | 9 | 0.376097 | 734 | 30.67279 |
| 38 | The Journal of Academic Librarianship | 9 | 0.376097 | 743 | 31.04889 |
| 39 | Journal of Academic Ethics | 8 | 0.334308 | 751 | 31.3832 |
| 40 | Journal of Business Research | 8 | 0.334308 | 759 | 31.71751 |
| 41 | Journal of Information Management | 8 | 0.334308 | 767 | 32.05182 |

| | | | | | |
|---|---|---|---|---|---|
| 42 | Knowledge Organization | 8 | 0.334308 | 775 | 32.38612 |
| 43 | University Library Journal | 8 | 0.334308 | 783 | 32.72043 |
| 44 | Government Information Quarterly | 7 | 0.29252 | 790 | 33.01295 |
| 45 | Interdisciplinary Journal of Taiwan Library Administration | 7 | 0.29252 | 797 | 33.30547 |
| 46 | Journal of Consumer Research | 7 | 0.29252 | 804 | 33.59799 |
| 47 | Journal of the Medical Library Association | 7 | 0.29252 | 811 | 33.89051 |
| 48 | Learned Publishing | 7 | 0.29252 | 818 | 34.18303 |
| 49 | Library Review | 7 | 0.29252 | 825 | 34.47555 |
| 50 | Library Science Quarterly | 7 | 0.29252 | 832 | 34.76807 |
| 51 | The Journal of Nursing | 7 | 0.29252 | 839 | 35.06059 |
| 52 | The Library Quarterly | 7 | 0.29252 | 846 | 35.35311 |
| 53 | Academy of Management Review | 6 | 0.250731 | 852 | 35.60384 |
| 54 | IEEE Intelligent Systems | 6 | 0.250731 | 858 | 35.85457 |
| 55 | Journal of Academic Librarianship | 6 | 0.250731 | 864 | 36.1053 |
| 56 | Journal of Educational Psychology | 6 | 0.250731 | 870 | 36.35604 |

| | | | | | |
|---|---|---|---|---|---|
| 57 | Library Journal | 6 | 0.250731 | 876 | 36.60677 |
| 58 | Malaysian Journal of Library & Information Science | 6 | 0.250731 | 882 | 36.8575 |
| 59 | Organization Science | 6 | 0.250731 | 888 | 37.10823 |
| 60 | Academy of Management Journal | 5 | 0.208943 | 893 | 37.31717 |
| 61 | American Psychologist | 5 | 0.208943 | 898 | 37.52611 |
| 62 | Behavioral and Brain Sciences | 5 | 0.208943 | 903 | 37.73506 |
| 62 | Behaviour and Information Technology | 5 | 0.208943 | 908 | 37.944 |
| 64 | Chinese Journal of Psychology | 5 | 0.208943 | 913 | 38.15294 |
| 65 | Communication & Society | 5 | 0.208943 | 918 | 38.36189 |
| 66 | Computers and Education | 5 | 0.208943 | 923 | 38.57083 |
| 67 | Decision Support Systems | 5 | 0.208943 | 928 | 38.77977 |
| 68 | D-Lib Magazine | 5 | 0.208943 | 933 | 38.98872 |
| 69 | Electronic Commerce Studies | 5 | 0.208943 | 938 | 39.19766 |
| 70 | Expert Systems with Applications | 5 | 0.208943 | 943 | 39.4066 |
| 71 | Feliciter | 5 | 0.208943 | 948 | 39.61554 |
| 72 | I n f o r m a t i o n Processing & Management | 5 | 0.208943 | 953 | 39.82449 |
| 73 | IFLA Journal | 5 | 0.208943 | 958 | 40.03343 |

| | | | | | |
|---|---|---|---|---|---|
| 74 | International Journal of Human-Computer Studies | 5 | 0.208943 | 963 | 40.24237 |
| 75 | Journal of Clinical Epidemiology | 5 | 0.208943 | 968 | 40.45132 |
| 76 | Journal of Library Science | 5 | 0.208943 | 973 | 40.66026 |
| 77 | Journal of Social Work Education | 5 | 0.208943 | 978 | 40.8692 |
| 78 | Library and Information | 5 | 0.208943 | 983 | 41.07815 |
| 79 | Library and Information Science Research | 5 | 0.208943 | 988 | 41.28709 |
| 80 | Libri | 5 | 0.208943 | 993 | 41.49603 |
| 81 | MIS Quarterly | 5 | 0.208943 | 998 | 41.70497 |
| 82 | Monumenta Serica | 5 | 0.208943 | 1003 | 41.91392 |
| 83 | National Central Library Bulletin | 5 | 0.208943 | 1008 | 42.12286 |
| 84 | Science and Engineering Ethics | 5 | 0.208943 | 1013 | 42.3318 |
| 85 | The Journal of the Library Science in Jiangxi | 5 | 0.208943 | 1018 | 42.54075 |
| 86 | The Lancet | 5 | 0.208943 | 1023 | 42.74969 |
| 112 | 26 journals with 4 citations | 104 | 4.346009 | 1127 | 47.0957 |
| 169 | 57 journals with 3 citations | 171 | 7.145842 | 1298 | 54.24154 |
| 317 | 148 journals with 2 citations | 296 | 12.36941 | 1594 | 66.61095 |
| 1116 | 799 journals with 1 citation | 799 | 33.38905 | **2393** | **100** |

It is evident from the Table 2 that the journal citations cited by researchers in journal of library and information studies are scattered in 1116 journal titles. Among them 'Scientometrics' occupies first rank for being cited more number of times with 4.01 percent of total citations, followed by 'Journal of the American Society for Information Science & Technology' (2.59%), 'Journal of Library and Information Studies' (1.71%), 'Journal of Documentation' (1.59%), and 'Information Processing and Management' (1.25%).

### 4.3 Productivity of Journals

Table 3 shows that the productivity of journals in journal of library and information studies is measured by dividing the total number of citations into four equal categories.

**Table 3: Productivity of Journals**

| Range of Citations | Number of journals covered | Number of Citations | Percentage of Journals | Average Productivity of Journals |
|---|---|---|---|---|
| 1 – 25 | 23 | 596 | 2.06 | 25.91 |
| 26 – 50 | 112 | 600 | 10.04 | 5.36 |
| 51 – 75 | 382 | 598 | 34.23 | 1.57 |
| 76 – 100 | 599 | 599 | 53.67 | 1.00 |
| **Total** | **1116** | **2393** | **100.00** | **2.14** |

Table 3 shows that the first 25% of citations are covered by the first 23 journals with an average productivity of 25.91 citations per journal which have high productivity. The second, third and fourth group of citations are covered by 112,382, and 599 journals respectively. This trend shows the decreasing productivity of cited journals in journal of library and information studies.

### 4.4 Journals and Bradford's Law

Bradford's (1985) Law of scattering predicts the increasing productivity of journals from one zone to the next (in the expression 1: n: n2: n3), the total numbers of articles can be divided into three equal zones as per Bradford's law. 2393 journal citations are scattered in 10 volumes of the source journal i.e. Journal of Library and Information Studies. The division of all citations in three equal zones retaining 798 in each zone shows the corresponding Bradford's ratio number of journals as follows:

45 : 273 : 798

This ratio can be written as:

$$45*(1 : 6.07 : 12.14)$$

This ratio may be approximated with the following values, $37*(1: 2: (2)^2)$, which was found that, on an approximation, the first zone contains 45 journals which are considered as Bradford's zone of core journals. The second zone contains the next 273 journals, and the last zone contained the next 798 journals. Hence, the distribution partially complies with Bradford's law.

### 4.5 Scattering of Journals and Citations over Bradford Zones

Journals are ranked and divided into groups of categories depending on the citations they received. These groups are termed Bradford zones.

**Table 4: Scattering of Journals and Citations over Bradford Zones**

| Zones | X | ∑x | y | ∑y | Ratio |
|---|---|---|---|---|---|
| I | 797 | 797 | 45 | 45 | 1 |
| II | 798 | 1595 | 273 | 318 | 1.16 |
| III | 798 | 2393 | 798 | 1116 | 1.40 |

Note: x = number of citations (each 1/3), ∑x = cumulative number of citations, y = number of journals, ∑y = cumulative number of journals.

From the table it is found that three zones are provided and the ratio is calculated as 1:2:3. The ratio between the number of journals in subsequent zones has been observed to be approximately 1: n : n2 Therefore here the expected ratio will be 1:2:4. By calculating the Bradford's law here it comes 1: 1.16 : 1.40 and therefore it does not fit Bradford's law.

## 5. Conclusion

The present study was undertaken to study the characteristics of literature used by researchers in the field of library and information studies. As a whole the study mainly applied citation analysis technique to analyze the citations. Citations appended to all the 123 issues of 10 volumes accounting for 5359 citations the base of the study. In bibliographic form wise distribution of citations it was seen that researchers are heavily depend on journals sources for their research compared to other bibliographic forms. 'Scientometrics journal' occupies first rank for being cited more number of times with 4.01 percent of total citations, followed by 'Journal of the American Society for Information Science & Technology' (2.59%), 'Journal of Library and Information Studies' (1.71%), 'Journal of Documentation' (1.59%), and 'Information Processing and Management' (1.25%) respectively. The

first 25% of citations are covered by the first 23 journals with an average productivity of 25.91 citations per journal which have high productivity.

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# Ranking and Scattering of Journals in the Field of Physics: A Study

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**Abstract**
*The present study is based on 12038 citations, appended in the 40 theses in physics submitted to Acharya Nagarjuna University, Guntur for the aware of doctoral degree during the period 2015-2020. It has been carried out bibliographic form-wise distribution of citations, ranked list of journals, productivity of journals, testing the application of Bradford's Law etc. The studies point towards the merits and weakness of the study which will be helpful for its further development. Result of this analysis find out the physics researchers referred mostly journal source rather than other sources. Journals are considered to be the most primary and authentic channels of communication for scientific information. Sharing of cited journals in the field of physics clearly indicates that a very small number of journals are contributing to maximum number of citations.*

**Keywords**: *Citation analysis, Physics journals, Bradford's Law*

## 1. Introduction

Any research initiative's primary goal is to promote the academic interests of a specific scholarly group or community, as well as the greater strata of society in general. When scientific processes are used, all research projects, whether applied or basic, quantitative or qualitative, seek informed, rational, and credible solutions to questions. Before reaching a conclusion, the researcher normally goes through a clear sequence of activities such as data gathering, analysis, and interpretation, which signals the effective resolution of the targeted problem. In the form of a typical document, the researcher documents his findings, observations, conclusions, and study reasoning, which are academically referred to as a research report, a

dissertation, or a paper. Be as it may, the objective behind every research initiative is to ensure that its contents or formulations reach a larger group of people and support their information needs.

Citation analysis deals with the analysis and measurement of the various patterns in which references from books and articles are cited, along with their rate of reappearance. Researchers employ citations in academic works for connecting to the other works as well as other researchers. In essence, citation analysis explores the nature, relevance and quality of relationships that the cited documents share with the citing documents. A cited document refers to the source of a reference as shown by the author as a part of his work, while the document that makes references of other documents is known as a citing document. Therefore, citation analysis broadly encompasses the analysis of a range of citations emanating from and into the documents, appended into the research message with the count of citations. In general, the citations appear at the bottom of a scientific article along with its number, which is known as citation analysis. In fact, citation analysis offers important perspectives into the significance and authority of the scholars as well as their work on other prospective researchers based on the frequency, mode and quantum of references.

## 2. Objectives of the study

The objectives of the study are:

i. to know the distribution of citations in different bibliographic forms;
ii. to examine the ranking and scattering of core journals;
iii. to find out the productivity of journals in the field of physics; and
iv. To test the suitability of verbal and graphical formulation of Bradford's Law of Scattering.

## 3. Materials and Methods

In the present study, the data was primarily obtained from doctoral theses in Physics. The study centers on examination of 40 doctoral theses submitted by research scholars in physics to Acharya Nagarjuna University, Guntur, Andhra Pradesh, India, 2015-2020. The researchers have identified 12038 citations for analysis as a part of this study with every thesis contributing 301 citations on average. The authors studied all the appended citations as appearing in the submitted theses in the field of physics. The authors examined the citations and recorded findings on significant aspects like author types, bibliographic forms, publication time, publisher credentials, name of the journals, country etc on reference cards measuring 12.5 X 7.5 cm (standard size). Ulrich's International Periodical Directory was referred to obtain information on cited journals, such as

the publishing country, the relevant subject, which was then transcribed in the reference cards and later entered into Ms-Excel work sheet. Finally, the data processing was done through a tool i.e. the Statistical Package for Social Sciences (SPSS).

## 4. Data Analysis

### 4.1 Bibliographic forms

The distribution of citations according to the different bibliographic forms in Physics is presented in Table 1.

**Table 1: Bibliographic forms in Physics**

| Bibliographic forms | Number of Citations | Percentage |
|---|---|---|
| Journals | 10460 | 86.89 |
| Books | 1369 | 11.37 |
| Conferences/seminars/ workshops/ Conventions etc. | 82 | 0.68 |
| Theses/Dissertations | 27 | 0.22 |
| Websites | 21 | 0.18 |
| Reports/Reviews | 18 | 0.15 |
| Newspapers | 14 | 0.12 |
| Patents | 09 | 0.07 |
| Others | 38 | 0.32 |
| **TOTAL** | **12038** | **100.00** |

Table 1 shows the distribution of citations among different bibliographic forms in Physics. It is evident from the table that the journals contribute the highest number of citations accounting for 86.89 percent of total citations. Books secured second highest number of citations accounting for 11.37 percent of total citations, followed by conference/seminars/workshops/conventions etc. (0.68%), theses/dissertations (0.22%), websites (0.18%), reports/reviews (0.15%), newspapers (0.12%), and patents (0.07%). The remaining 0.32 percent of citations is from other bibliographic forms. Hence, it can be concluded that the journals are the most information resources are cited by the researchers in physics subject literature.

### 4.2 Rank list of journals in Physics

The distribution of citations of articles cited in Physics according to the ranking of journals is shown in Table 2.

**Table 2: Ranks list of journals in Physics**

| S. No | Name of the journal | Citations | | | Cumulative | |
|---|---|---|---|---|---|---|
| | | Rank | No | % | No | % |
| 1 | Journal of Non-Crystalline Solids | 1 | 1504 | 14.38 | 1504 | 14.38 |
| 2 | The Journal of Alloys and Compounds | 2 | 339 | 3.24 | 1843 | 17.62 |
| 3 | Physics and Chemistry of Glasses | 3 | 338 | 3.23 | 2181 | 20.85 |
| 4 | Journal of Luminescence | 4 | 300 | 2.87 | 2481 | 23.72 |
| 5 | Indian Journal of Pure and Applied Physics | 5 | 272 | 2.60 | 2753 | 26.32 |
| 6 | Physical Review | 6 | 253 | 2.42 | 3006 | 28.74 |
| 7 | Optical Materials | 7 | 252 | 2.41 | 3258 | 31.15 |
| 8 | Physica-B | 8 | 232 | 2.22 | 3490 | 33.37 |
| 9 | Molecular Crystals and Liquid Crystals | 9 | 230 | 2.20 | 3720 | 35.57 |
| 10 | Materials Chemistry and Physics | 10 | 207 | 1.98 | 3927 | 37.55 |
| 11 | Journal of Physics and Chemistry of Solids | 11 | 199 | 1.90 | 4126 | 39.45 |
| 12 | Journal of Chemical Physics | 12 | 172 | 1.65 | 4298 | 41.10 |
| 13 | Materials Research Bulletin | 13 | 169 | 1.62 | 4467 | 42.72 |
| 14 | Journal of the American Ceramic Society | 14 | 158 | 1.51 | 4625 | 44.23 |
| 15 | Spectrochimica Acta Part A: Molecular and Biomolecular Spectroscopy | 15 | 152 | 1.45 | 4777 | 45.68 |
| 16 | Journal of Chemical and Engineering Data | 16 | 148 | 1.42 | 4925 | 47.10 |
| 17 | Journal of Molecular Liquids | 17 | 140 | 1.34 | 5065 | 48.44 |
| 18 | Journal of Materials Research | 18 | 128 | 1.22 | 5193 | 49.66 |

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|---|---|---|---|---|---|---|
| 19 | Liquid Crystals | 19 | 126 | 1.21 | 5319 | 50.87 |
| 20 | The Journal of Physical Chemistry | 20 | 125 | 1.20 | 5444 | 52.07 |
| 21 | The Journal of Chemical Physics | 21 | 124 | 1.19 | 5568 | 53.26 |
| 22 | Solid State Communications | 22 | 121 | 1.16 | 5689 | 54.42 |
| 23 | Solid State Solid State Ionics | 23 | 111 | 1.06 | 5800 | 55.48 |
| 24 | Materials Letters | 24 | 106 | 1.01 | 5906 | 56.49 |
| 25 | Journal of Molecular Structure | 25 | 100 | 0.96 | 6006 | 57.45 |
| 26 | Physica status solidi | 26 | 99 | 0.95 | 6105 | 58.40 |
| 27 | Philosophical Magazine | 27 | 98 | 0.94 | 6203 | 59.34 |
| 28 | Journal of Solid State Chemistry | 28 | 82 | 0.78 | 6285 | 60.12 |
| 29 | Journal of Physics: Condensed Matter | 29 | 81 | 0.77 | 6366 | 60.89 |
| 30 | Journal of Pure and Applied Ultrasonics | 30 | 75 | 0.72 | 6441 | 61.61 |
| 31 | Chemical Physics | 31 | 72 | 0.69 | 6513 | 62.30 |
| 32 | ZeitschriftfürNaturforschung B | 32 | 64 | 0.61 | 6577 | 62.91 |
| 33 | Ceramics International | 33 | 63 | 0.60 | 6640 | 63.51 |
| 34 | Journal of Magnetism and Magnetic Materials | 33 | 63 | 0.60 | 6703 | 64.11 |
| 35 | Applied Physics Letters | 34 | 62 | 0.59 | 6765 | 64.70 |
| 36 | Journal of Solution Chemistry | 35 | 59 | 0.56 | 6824 | 65.26 |
| 37 | ThermochimicaActa | 36 | 58 | 0.55 | 6882 | 65.81 |
| 38 | Proceedings of the Royal Society | 37 | 57 | 0.54 | 6939 | 66.35 |
| 39 | The Journal of Chemical Thermodynamics | 37 | 57 | 0.54 | 6996 | 66.89 |
| 40 | Optics Express | 38 | 54 | 0.52 | 7050 | 67.41 |
| 41 | Journal of The Electrochemical Society | 39 | 53 | 0.51 | 7103 | 67.92 |
| 42 | Optics Communications | 39 | 53 | 0.51 | 7156 | 68.43 |
| 43 | Solid State Sciences | 40 | 51 | 0.49 | 7207 | 68.92 |
| 44 | Indian Journal of Physics | 41 | 50 | 0.48 | 7257 | 69.40 |
| 45 | Journal of the Physical Society of Japan | 42 | 48 | 0.46 | 7305 | 69.86 |

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|---|---|---|---|---|---|---|
| 46 | The Journal of Physical Chemistry B | 42 | 48 | 0.46 | 7353 | 70.32 |
| 47 | Transactions of the Faraday Society | 43 | 45 | 0.43 | 7398 | 70.75 |
| 48 | Materials Science and Engineering: B | 44 | 44 | 0.42 | 7442 | 71.17 |
| 49 | Journal of Materials Chemistry | 45 | 42 | 0.40 | 7484 | 71.57 |
| 50 | Journal of Optoelectronics and Advanced Materials | 45 | 42 | 0.40 | 7526 | 71.97 |
| 51 | Fluid Phase Equilibria | 46 | 40 | 0.38 | 7566 | 72.35 |
| 52 | Acoustics Research Letters Online | 47 | 39 | 0.37 | 7605 | 72.72 |
| 53 | Bulletin of Materials Science | 48 | 38 | 0.36 | 7643 | 73.08 |
| 54 | Solid State Ionics | 48 | 38 | 0.36 | 7681 | 73.44 |
| 55 | Thin Solid Films | 48 | 38 | 0.36 | 7719 | 73.80 |
| 56 | Advances in Physics | 49 | 36 | 0.34 | 7755 | 74.14 |
| 57 | Annalen der Physik | 50 | 35 | 0.33 | 7790 | 74.47 |
| 58 | Journal of the European Ceramic Society | 51 | 32 | 0.31 | 7822 | 74.78 |
| 59 | Nuclear Instruments and Methods in Physics Research Section B | 51 | 32 | 0.31 | 7854 | 75.09 |
| 60 | Acta Acustica | 52 | 31 | 0.30 | 7885 | 75.39 |
| 61 | Acta Crystallographic B | 52 | 31 | 0.30 | 7916 | 75.69 |
| 62 | Journal of the acoustical society of India | 52 | 31 | 0.30 | 7947 | 75.99 |
| 63 | Crystal Research and Technology | 53 | 29 | 0.28 | 7976 | 76.27 |
| 64 | Canadian Journal of Chemistry | 54 | 28 | 0.27 | 8004 | 76.54 |
| 65 | Molecular Physics | 54 | 28 | 0.27 | 8032 | 76.81 |
| 66 | Applied Physics B | 55 | 27 | 0.26 | 8059 | 77.07 |
| 67 | Journal of Physics D Applied Physics | 55 | 27 | 0.26 | 8086 | 77.33 |
| 68 | Bulletin of the Chemical Society of Japan | 56 | 26 | 0.25 | 8112 | 77.58 |
| 69 | Chemistry of Materials | 56 | 26 | 0.25 | 8138 | 77.83 |

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|---|---|---|---|---|---|---|
| 70 | Materials Science and Engineering: A | 56 | 26 | 0.25 | 8164 | 78.08 |
| 71 | Society of Glass Technology | 56 | 26 | 0.25 | 8190 | 78.33 |
| 72 | Journal of the American Chemical Society | 57 | 24 | 0.23 | 8214 | 78.56 |
| 73 | Inorganic Chemistry | 58 | 23 | 0.22 | 8237 | 78.78 |
| 74 | Journal of the Chemical Society Faraday Transactions | 58 | 23 | 0.22 | 8260 | 79.00 |
| 75 | Modern Physics Letters | 58 | 23 | 0.22 | 8283 | 79.22 |
| 76 | Nature journal | 58 | 23 | 0.22 | 8306 | 79.44 |
| 77 | Physics and Chemistry of Liquid | 58 | 23 | 0.22 | 8329 | 79.66 |
| 78 | Radiation Measurements | 59 | 22 | 0.21 | 8351 | 79.87 |
| 79 | Geochemica Cosmochimica Acta | 60 | 21 | 0.21 | 8372 | 80.08 |
| 80 | Journal of Rare Earths | 61 | 21 | 0.21 | 8393 | 80.29 |
| 81 | Physica Status Solidi C | 61 | 21 | 0.21 | 8414 | 80.50 |
| 82 | Journal of Physics | 62 | 20 | 0.19 | 8434 | 80.69 |
| 83 | Physica Status Solidi B | 62 | 20 | 0.19 | 8454 | 80.88 |
| 84 | Proceedings of the Physical Society | 62 | 20 | 0.19 | 8474 | 81.07 |
| 85 | Vibrational Spectroscopy | 62 | 20 | 0.19 | 8494 | 81.26 |
| 86 | Journal of the Optical Society of America B | 63 | 19 | 0.18 | 8513 | 81.44 |
| 87 | The Japanese Journal of Applied Physics | 63 | 19 | 0.18 | 8532 | 81.62 |
| 88 | Advanced Materials Research | 64 | 18 | 0.17 | 8550 | 81.79 |
| 89 | Glass Physics and Chemistry | 65 | 17 | 0.16 | 8567 | 81.95 |
| 90 | Industrial and Engineering Chemistry | 65 | 17 | 0.16 | 8584 | 82.11 |
| 91 | Physics Letters | 65 | 17 | 0.16 | 8601 | 82.27 |
| 92 | Ultrasonics | 65 | 17 | 0.16 | 8618 | 82.43 |
| 93 | Glass Science and Technology: Glastechnische Berichte | 66 | 16 | 0.15 | 8634 | 82.58 |
| 94 | International Journal of Thermophysics | 66 | 16 | 0.15 | 8650 | 82.73 |

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|---|---|---|---|---|---|---|
| 95 | Journal of Quantitative Spectroscopy and Radiative Transfer | 66 | 16 | 0.15 | 8666 | 82.88 |
| 96 | Optics and Laser Technology | 66 | 16 | 0.15 | 8682 | 83.03 |
| 97 | Science | 66 | 16 | 0.15 | 8698 | 83.18 |
| 98 | The journal Solid State Nuclear Magnetic Resonance | 66 | 16 | 0.15 | 8714 | 83.33 |
| 99 | Acta Physica Polonica A | 67 | 15 | 0.14 | 8729 | 83.47 |
| 100 | Advanced Functional Materials | 67 | 15 | 0.14 | 8744 | 83.61 |
| 101 | Applied Surface Science | 67 | 15 | 0.14 | 8759 | 83.75 |
| 102 | Rasayan Journal of Chemistry | 67 | 15 | 0.14 | 8774 | 83.89 |
| 103 | Optical Materials | 68 | 14 | 0.13 | 8788 | 84.02 |
| 104 | Pramana | 68 | 14 | 0.13 | 8802 | 84.15 |
| 105 | Radiation Protection Dosimetry | 68 | 14 | 0.13 | 8816 | 84.28 |
| 106 | Russian Journal of Physical Chemistry A | 68 | 14 | 0.13 | 8830 | 84.41 |
| 107 | Scripta Metallurgica | 68 | 14 | 0.13 | 8844 | 84.54 |
| 108 | The Journal of the Chinese Ceramic Society | 68 | 14 | 0.13 | 8858 | 84.67 |
| 109 | Theoretica Chimica Acta | 68 | 14 | 0.13 | 8872 | 84.80 |
| 110 | Zeitschrift für Physikalische Chemie | 68 | 14 | 0.13 | 8886 | 84.93 |
| 111 | Acta Chemica Scandinavica | 69 | 13 | 0.12 | 8899 | 85.05 |
| 112 | Advanced Materials | 69 | 13 | 0.12 | 8912 | 85.17 |
| 113 | Indian Journal of Chemistry - Section A | 69 | 13 | 0.12 | 8925 | 85.29 |
| 114 | Journal of Materials Science: Materials in Electronics | 69 | 13 | 0.12 | 8938 | 85.41 |
| 115 | Journal of Raman Spectroscopy | 69 | 13 | 0.12 | 8951 | 85.53 |
| 116 | Optics and Lasers in Engineering | 69 | 13 | 0.12 | 8964 | 85.65 |
| 117 | The Journal of Power Sources | 69 | 13 | 0.12 | 8977 | 85.77 |
| 118 | American Mineralogist | 70 | 12 | 0.11 | 8989 | 85.88 |
| 119 | Asian Journal of Chemistry | 70 | 12 | 0.11 | 9001 | 85.99 |
| 120 | Chemistry - A European Journal | 70 | 12 | 0.11 | 9013 | 86.10 |

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|---|---|---|---|---|---|---|
| 121 | Journal of Chemical and Pharmaceutical Research | 70 | 12 | 0.11 | 9025 | 86.21 |
| 122 | Physics and Chemistry of Minerals | 70 | 12 | 0.11 | 9037 | 86.32 |
| 123 | Reviews of Modern Physics | 70 | 12 | 0.11 | 9049 | 86.43 |
| 124 | Acta Optica Sinica | 71 | 11 | 0.10 | 9060 | 86.53 |
| 125 | Applied Optics | 71 | 11 | 0.10 | 9071 | 86.63 |
| 126 | Chemical Reviews | 71 | 11 | 0.10 | 9082 | 86.73 |
| 127 | Clay minerals | 71 | 11 | 0.10 | 9093 | 86.83 |
| 128 | IEEE Dielectrics and Electrical Insulation | 71 | 11 | 0.10 | 9104 | 86.93 |
| 129 | Journal of Crystal Growth | 71 | 11 | 0.10 | 9115 | 87.03 |
| 130 | Journal of the American Oil Chemists' Society | 71 | 11 | 0.10 | 9126 | 87.13 |
| 131 | Physical Review Letters | 71 | 11 | 0.10 | 9137 | 87.23 |
| 132 | The Journal of Physical Chemistry C | 71 | 11 | 0.10 | 9148 | 87.33 |
| 133 | The Journal of Solid State Chemistry | 71 | 11 | 0.10 | 9159 | 87.43 |
| 134 | Chemical Geology | 72 | 10 | 0.09 | 9169 | 87.52 |
| 135 | International Journal of Modern Physics B | 72 | 10 | 0.09 | 9179 | 87.61 |
| 136 | Journal of Inorganic and Nuclear Chemistry | 72 | 10 | 0.09 | 9189 | 87.70 |
| 137 | Journal of Rare Earths | 72 | 10 | 0.09 | 9199 | 87.79 |
| 138 | Journal of The Journal of Alloys and Compounds | 72 | 10 | 0.09 | 9209 | 87.88 |
| 139 | Philosophical Magazine Letters | 72 | 10 | 0.09 | 9219 | 87.97 |
| 140 | The European Physical Journal Applied Physics | 72 | 10 | 0.09 | 9229 | 88.06 |
| 141 | Acta Physica | 73 | 9 | 0.09 | 9238 | 88.15 |
| 142 | Comptes Rendus Chimie | 73 | 9 | 0.09 | 9247 | 88.24 |
| 143 | Materials Science Forum | 73 | 9 | 0.09 | 9256 | 88.33 |
| 144 | Nuclear Instruments and Methods in Physics Research | 73 | 9 | 0.09 | 9265 | 88.42 |
| 145 | Radiation Physics and Chemistry | 73 | 9 | 0.09 | 9274 | 88.51 |

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|---|---|---|---|---|---|---|
| 146 | Review of Scientific Instruments | 73 | 9 | 0.09 | 9283 | 88.60 |
| 147 | Science and Technology of Advanced Materials | 73 | 9 | 0.09 | 9292 | 88.69 |
| 148 | Sensors and Actuators B: Chemical | 73 | 9 | 0.09 | 9301 | 88.78 |
| 149 | The Journal of Journal of Rare Earths | 73 | 9 | 0.09 | 9310 | 88.87 |
| 150 | Journal of Food Engineering | 74 | 8 | 0.08 | 9318 | 88.95 |
| 151 | Journal of Nuclear Materials | 74 | 8 | 0.08 | 9326 | 89.03 |
| 152 | Journal of the Ceramic Society of Japan | 74 | 8 | 0.08 | 9334 | 89.11 |
| 153 | Journal of Thermal Analysis and Calorimetry | 74 | 8 | 0.08 | 9342 | 89.19 |
| 154 | Materials & Design | 74 | 8 | 0.08 | 9350 | 89.27 |
| 155 | Structure and Bonding | 74 | 8 | 0.08 | 9358 | 89.35 |
| 156 | The American Journal of Applied Sciences | 74 | 8 | 0.08 | 9366 | 89.43 |
| 157 | Applied Magnetic Resonance | 75 | 7 | 0.07 | 9373 | 89.50 |
| 158 | Canadian Journal of Physics | 75 | 7 | 0.07 | 9380 | 89.57 |
| 159 | Canadian Mineral Production Canadian Mineral Production | 75 | 7 | 0.07 | 9387 | 89.64 |
| 160 | Colloids and Surfaces B: Bio-interfaces | 75 | 7 | 0.07 | 9394 | 89.71 |
| 161 | Infrared Physics & Technology | 75 | 7 | 0.07 | 9401 | 89.78 |
| 162 | Journal of Hazardous Materials | 75 | 7 | 0.07 | 9408 | 89.85 |
| 163 | Nanotechnology | 75 | 7 | 0.07 | 9415 | 89.92 |
| 164 | Photonics Technology Letters | 75 | 7 | 0.07 | 9422 | 89.99 |
| 165 | Reports on Progress in Physics | 75 | 7 | 0.07 | 9429 | 90.06 |
| 166 | The Journal of Materials Science: Materials | 75 | 7 | 0.07 | 9436 | 90.13 |
| 167 | The Journal of the American Chemical Society | 75 | 7 | 0.07 | 9443 | 90.20 |
| 168 | University of Science and Technology of China | 75 | 7 | 0.07 | 9450 | 90.27 |
| 169 | Zeitschrift für Physik A | 75 | 7 | 0.07 | 9457 | 90.34 |
| 170 | Biochemistry | 76 | 6 | 0.06 | 9463 | 90.40 |

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|---|---|---|---|---|---|---|
| 171 | Chinese Physics Letters | 76 | 6 | 0.06 | 9469 | 90.46 |
| 172 | ComptesRendus de l'Académie des Sciences | 76 | 6 | 0.06 | 9475 | 90.52 |
| 173 | Coordination Chemistry Reviews | 76 | 6 | 0.06 | 9481 | 90.58 |
| 174 | Discussions of the Faraday Society | 76 | 6 | 0.06 | 9487 | 90.64 |
| 175 | Eurasian Chemico-Technological Journal | 76 | 6 | 0.06 | 9493 | 90.70 |
| 176 | International Journal of Inorganic Materials | 76 | 6 | 0.06 | 9499 | 90.76 |
| 177 | Journal of Microscopy | 76 | 6 | 0.06 | 9505 | 90.82 |
| 178 | Journal of Physics and Chemistry of Solids | 76 | 6 | 0.06 | 9511 | 90.88 |
| 179 | Journal of Solid State Electrochemistry | 76 | 6 | 0.06 | 9517 | 90.94 |
| 180 | Journal of the Chemical Society | 76 | 6 | 0.06 | 9523 | 91.00 |
| 181 | Kristallografiya | 76 | 6 | 0.06 | 9529 | 91.06 |
| 182 | Laser Physics | 76 | 6 | 0.06 | 9535 | 91.12 |
| 183 | OpticaApplicata | 76 | 6 | 0.06 | 9541 | 91.18 |
| 184 | Optical Engineering | 76 | 6 | 0.06 | 9547 | 91.24 |
| 185 | Pattern Recognition - | 76 | 6 | 0.06 | 9553 | 91.30 |
| 186 | Quantum Electronics | 76 | 6 | 0.06 | 9559 | 91.36 |
| 187 | Solid State Phenomena | 76 | 6 | 0.06 | 9565 | 91.42 |
| 188 | Journal of Materials Science Letters | 76 | 6 | 0.06 | 9571 | 91.48 |
| 189 | The Journal of the Acoustical Society of America' | 76 | 6 | 0.06 | 9577 | 91.54 |
| 190 | Zeitschrift für Angewandte Mathematik and Physik | 76 | 6 | 0.06 | 9583 | 91.60 |
| 191 | ActaPhotonicaSinica | 77 | 5 | 0.05 | 9588 | 91.65 |
| 192 | Acta Physica Sinica- | 77 | 5 | 0.05 | 9593 | 91.70 |
| 193 | Applied Acoustics | 77 | 5 | 0.05 | 9598 | 91.75 |
| 194 | Chemical Society Reviews | 77 | 5 | 0.05 | 9603 | 91.80 |
| 195 | Current Opinion in Solid State & Materials Science | 77 | 5 | 0.05 | 9608 | 91.85 |

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|---|---|---|---|---|---|---|
| 196 | European Journal of Glass Science and Technology Part B | 77 | 5 | 0.05 | 9613 | 91.90 |
| 197 | Ferroelectrics Letters Section | 77 | 5 | 0.05 | 9618 | 91.95 |
| 198 | International Journal of Engineering Research and Applications | 77 | 5 | 0.05 | 9623 | 92.00 |
| 199 | Journal of Electron Spectroscopy and Related Phenomena | 77 | 5 | 0.05 | 9628 | 92.05 |
| 200 | Journal of the Less Common Metals | 77 | 5 | 0.05 | 9633 | 92.10 |
| 201 | Macromolecules | 77 | 5 | 0.05 | 9638 | 92.15 |
| 202 | Modern Physics Letters B | 77 | 5 | 0.05 | 9643 | 92.20 |
| 203 | Monatshefte für Chemie | 77 | 5 | 0.05 | 9648 | 92.25 |
| 204 | Optics and Spectroscopy | 77 | 5 | 0.05 | 9653 | 92.30 |
| 205 | Opto-Electronics and Advanced Materials -Rapid Communications | 77 | 5 | 0.05 | 9658 | 92.35 |
| 206 | Polonica A | 77 | 5 | 0.05 | 9663 | 92.40 |
| 207 | Radiation Effects and Defects in Solids | 77 | 5 | 0.05 | 9668 | 92.45 |
| 208 | Soviet physics crystallography | 77 | 5 | 0.05 | 9673 | 92.50 |
| 209 | The European Physical Journal A | 77 | 5 | 0.05 | 9678 | 92.55 |
| 252 | 43 journals with 4 citations | 78 | 172 | 1.64 | 9850 | 94.19 |
| 309 | 57 journals with 3 citations | 79 | 171 | 1.63 | 10021 | 95.82 |
| 414 | 105 journals with 2 citations | 80 | 210 | 2.00 | 10231 | 97.82 |
| 643 | 229 journals with 1 citation | 81 | 229 | 2.19 | **10460** | **100.01** |

Table 2 shows that the rank list of journals in Physics. It is obvious from the table that the journal citations cited by research scholars of Physics are scattered in 643 journals. Among them '**Journal of Non-Crystalline Solids**' occupies first rank for being cited more number of times with 14.38 percent of the total citations, followed by 'The Journal of Alloys and Compounds', (3.24%), 'Physics and Chemistry of Glasses' (3.23%), 'Journal of Luminescence' (2.87%), 'Indian Journal of Pure and Applied Physics' (2.60%), 'Physical Review'(2.42%), 'Optical

Materials'(2.41%), 'Physics - B' (2.22%), 'Molecular Crystals and Liquid Crystals' (2.20%) and 'Materials Chemistry and Physics' (1.98%).

The first 05 journals in the rank list contribute 25% of total journal citations in Physics. The first 19 journals in the rank list contribute 50% of total journal citations. These 24 journals can be considered as the most cited journals by the researchers in Physics subject literature. It is also obvious from the table that 75% of total citations are contributed by the first 59 journals in the rank list. The remaining 25% of citations are scattered among 584 journals.

### 4.3 Productivity of journals in Physics

The productivity of cited journals in the Physics is in Table 3.

**Table 3: Productivity of journals in Physics**

| S.No | Percentage of Citations | No. of Citations | No. of Journals covered | Percentage of Journals | Average Productivity of articles |
|---|---|---|---|---|---|
| 1 | 0 – 25% | 2753 | 05 | 0.78 | 550.60 |
| 2 | 26 – 50% | 2566 | 14 | 2.18 | 183.29 |
| 3 | 51 – 75% | 2535 | 40 | 6.22 | 63.38 |
| 4 | 76 – 100% | 2606 | 584 | 90.82 | 4.46 |
| **Total** | | **10460** | **643** | **100.00** | **16.27** |

It is evident from Table 3 that in Physics literature the first 25% of citations are from the 05 journals, thus signifying their high rate of productivity. The average rate of productivity of journals in the first group is 550.60 articles, followed by second group is 183.29 articles, third group is 63.38 articles and the last groups is only 4.46 articles. Hence, this shows the concentration of more number of citations in few journals only.

### 4.4 Implementation of Bradford's Law

To observe the appropriateness of the distribution of journals using the verbal formulation of Bradford Law, the following explanations were made and the results were presented. The first part deals with the verbal formulation of the theory based on data consisting of whole journal references arranged by their decreasing frequency of citations, while the second part examines the graphical representations based on the same data.

### 4.5 Verbal Formulation

The number of cited journals has been arranged by decreasing number of citations. To test the verbal formulation of Bradford's Law, the rank number of journals, number of citations, cumulative citations were given. For testing the algebraic interpretation of the law, the 643 journals were divided into three zones. The Bradford's multiplier factor was arrived at by dividing journals of a zone by its preceding zone. Bradford's multiplier was expressed as the ratio of the number of journals in any group to the number of journals in any immediately preceding group. The basis for choosing the three zones was that the percentage error in distribution of citations, among the three zones should be minimum. The distribution of journals and corresponding number of citations in the three zones are shown in Table No. 4.

**Table 4: Bradford's Zones for Physics**

| Zones | Citations | Journals | Percentage of Journals | Cumulative | | |
|---|---|---|---|---|---|---|
| | | | | No. of Citations | No. of Journals | Percentage of Journals |
| **I** | 3490 | 08 | 1.24 | 3490 | 08 | 1.24 |
| **II** | 3449 | 30 | 4.67 | 6939 | 38 | 5.91 |
| **III** | 3521 | 605 | 94.09 | **10460** | **643** | **100.00** |

In the present data set (Table 4) it was observed that, 08 journals covered 3490 citations, next 30 journals covered 3449 citations and next 605 journals covered 3521 citations. In other words, one third of the total citations have been covered by each group of the journals.

According to Bradford's, the zones, thus identifies will form an approximately geometric series in the form $1:n:n^2$ . But it was found that the relationship of each zone in the present study is 8:30:605.

$8 : 30 : 605 : : 1 : n : n^2$

Here 8 represent the number of core periodicals in the

$$n = \frac{\frac{30}{8} + \frac{605}{30}}{2} = \frac{3.75 + 20.17}{2} = \frac{23.92}{2} = 11.96$$

$n = 11.96$ is a multiplier

Therefore, $1 \times 8: 8 \times 11.96: 8 \times (11.96)^2 = 8: 95.68:1144.33$

$$Percentageoferror = \frac{1248.01 - 643}{643} X\ 100$$
$$= \frac{605.01}{643} X\ 100$$
$$= 0.941\ X\ 100 = 94.18$$

Here the percentage of error is significant. It is also observed that, the number of journals contributing citations to each zone increases by a multiplier of 11.96. So it can be said that the distribution in present study not follow Bradford's law for more confirmation of this law we can apply one more law i.e. Leimkuhler model.

### 4.6 Application of Leimkuhler model

For application of Bradford's law, the citations distribution was divided in three zones (p). Bradford assumes that there should be minimum three zones, here also 'p' is assumed to be 3. Then by using the mathematical formula, the value of the Bradford's multiplier 'k' is calculated as

$k = (e^y \times y_m)^{1/p}$
Where $e^y = 1.781$ Eulers number
$y_m$ = first rank Journal citations
p = p is number of zone
$k = (1.781 \times 1504)^{1/3}$
$= (2678.624)^{1/3}$
$= \sqrt[3]{2678.624}$
$= 13.89$

$$yo = \frac{A}{P}$$

Where $y_0$ = No of citations in each zone
A = No. of Citations
P = 3

$$yo = \frac{10460}{3} = 3487$$

The nucleus zone $r_0$ can be defined as:

$$ro = \frac{T(k-1)}{k^p - 1}$$
$$\frac{643(13.89 - 1)}{13.89^3 - 1}$$

$$= 643\ X \frac{12.89}{(2679.83 - 1)}$$
$$= \frac{8288.27}{2678.83}$$
$$ro = 3.09$$

Different Bradford's zone can be obtained using the value of k and $r_0$.
Nucleus zone $r_0 = r_0 \times 1 = 3.09$
First zone $r_1 = r_0 \times k = 3.09 \times 13.89 = 42.92$
Second zone $r_2 = r_0 \times k^2 = 3.09 \times 13.89 \times 13.89 = 596.16$
3.09: 42.92: 596.16 = 642.17

$$Percentageoferror = \frac{642.17 - 643}{634} X100 = \frac{0.83}{643} X100$$

$$= 0.00129\ X100 = 0.129$$

The Bradford groups thus formed were shown in the table no. 4A

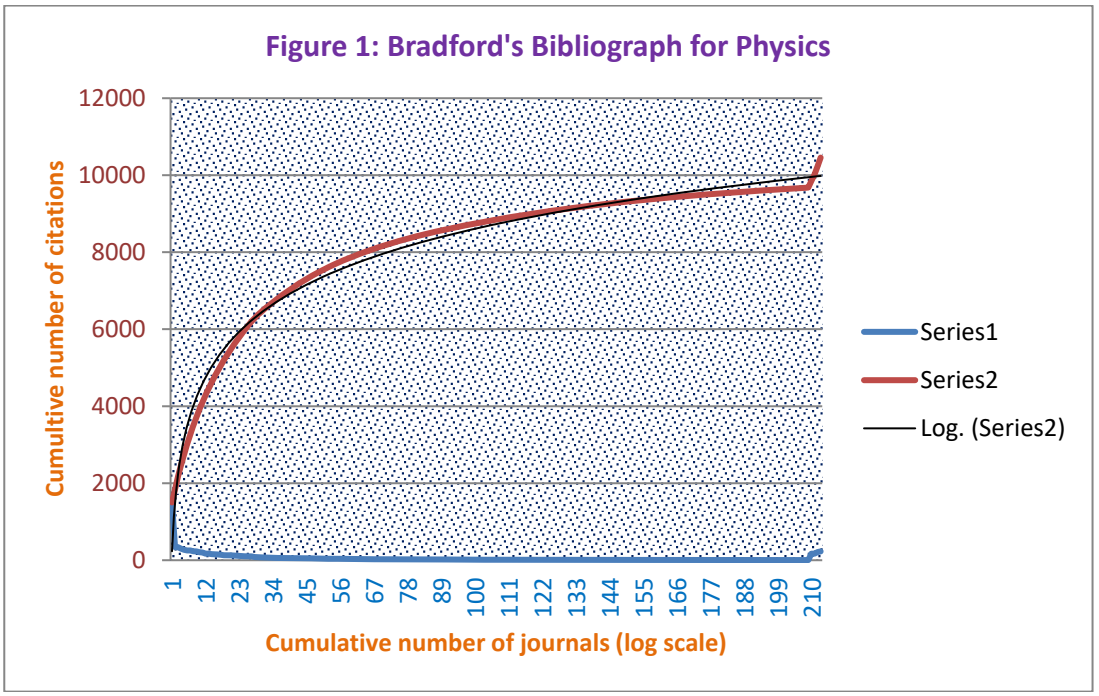
**Table 4A : Using Leimkuhler Model, Bradford's Zone and Number of Journals**

| Zones | Number of Journals | Number of Citations | Percentage of Journals |
|---|---|---|---|
| I (Core) | 3 | 2181 | 0.47 |
| II | 43 | 5172 | 6.69 |
| III | 597 | 3107 | 92.84 |
| **TOTAL** | **643** | **10460** | **100.00** |

Here the percentage of error is very much significant. It was observed that, the number of journals contributing citation to each zone is increased by multiplier of 13.89. The data of zonal analysis shows that there is no equal 1/3rd of total citations in each zone. Journals in nucleus zone are 0.47 percent productive and productivity of journals increases in next subsequent zones. This theoretical presentation of Bradford's law proves that Bradford's law of Scattering is not valid in present study.

### 4.7 Graphical Formulation

Bradford's Bibliograph for present study have been plotted taking the cumulative number of journal titles on the X-axis and cumulative number of citations on the Y-axis. From the figure 1 it is found that data in present study have an initial raising curve and followed by linearity. From the figure it is also not confirms that Bradford's law of Scattering is suitable for the present study.




### Conclusion

The study revealed that journals contribute the highest number of citations, accounting for 86.89 percent of the total citations. Books secured the second highest number of citations, accounting for 11.37 percent of the total citations. The rank list of journals in the field of physics indicates that 10460 citations were scattered in 643 journal titles. Out of these 643 journals first 8 journals contribute 3490 (1.24%) citations i.e. 1/3rd citations and these 8 journals are core journals in the field of physics. To test the Bradford's Law, 643 journals and 10460 citations were divided in three zones of equal number of citations. After dividing citations in three zones the number journals in each zones is in the ratio of '8: 30: 605'. The analysis of data that scattering of journal titles in the field of physics is not follows Bradford's Law. The Method based on the Leimkuhler model was used for the

verification of Bradford's Law. From the study it is found that Law is not fit for the present data set.

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# Scientometric Analysis of Contribution to Indian Journal of Information Sources and Services

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## Abstract:

*Scientometric analysis of 303 research contribution in Indian journal of information sources and services published during 2011-2021. The study examine various parameter such as year wise distribution, average article per year, form wise distribution, subject wise, authorship productivity and length of the article etc. the study reveals the male author contribution more than female author contribution and multi author contribution are more than single author contribution. Geographical distribution shows that most of the contributions are contributed from Tamilnadu.*

**Keywords:** *Scientometric analysis; Journals; Authorship Productivity; Bibliometrics; Research contribution*

## 1. Introduction

Scientometrics analyses is a discipline which scientific publications to explore the structure and growth of science. It is a techniques used to analyze the quantitative and qualitative aspects of publications. Scientometrics is a type of research method used to evaluate and measure various characteristics of libraries, scientific publications and etc. Scientometrics research includes studies related to the scattering & growth of literature, author productivity and distribution of scientific literature by country, etc. which helps to monitor the growth & pattern of research. In this paper, an attempt has been made to analyze the contributions to Indian Journal of Information Sources and Services published during the year 2011 – 2021, in order to explore the growth of literature, average citation per year, authorship pattern, subject wise distribution, Geographical distribution and length of the papers among the contributions.

## 2. Source Journal

Indian Journal of Information Sources and Services (IJISS)is a open access journal and has been selected as the source journal for the present study. It is a half-yearly is a peer reviewed research journal of Library and Information Science. The scope of this journal covers all branches of Library and Information Sciences like Library Management, Information Systems & Services, Information Processing and Retrieval, Information Sources and Services etc.

## 3. Objective of the study

The present study is investigate the following objectives

1. To find out the year wise distribution of research contributions in each volume.
2. To identify the average number of research contributions in each volume.
3. To know the gender wise distribution of article.
4. To know the distribution of research contributions in various subject disciplines.
5. To examine the authorship pattern of the research contributions.
6. To examine the average length of articles in the journal.
7. To examine the Geographical distribution of research contributions.

## 4. Scope and Limitation of the study

The present study is focused on the analysis of the 303 research contributions from the open access journal of Indian Information sources and services and its covers 11 volumes during 2011-2021. The research contributions were analysed according to the objectives of the present study. This study is limited to research papers published between 2011 to 2021 only.

## 5. Methodology

Content analysis method is going to use for analysing the data. The data collected from the content page of the research articles. The collected data have been analysed from different aspect such as year wise distribution, average article per year, authorship pattern, and length of the article, etc. The data has been presented in the following table.

## 6. Data Analysis and Interpretation

**Table1: Year Wise Distribution of Research Contributions**

| Year | Vol. No | No. of Issues | No of publications | % |
|---|---|---|---|---|
| 2011 | 1 | 2 | 25 | 8.25 |
| 2012 | 2 | 2 | 27 | 8.91 |
| 2013 | 3 | 2 | 18 | 5.94 |
| 2014 | 4 | 2 | 25 | 8.25 |
| 2015 | 5 | 2 | 14 | 4.62 |
| 2016 | 6 | 2 | 16 | 5.28 |
| 2017 | 7 | 2 | 19 | 6.27 |
| 2018 | 8 | 3 | 60 | 19.80 |
| 2019 | 9 | 3 | 65 | 21.45 |
| 2020 | 10 | 2 | 17 | 5.61 |
| 2021 | 11 | 2 | 17 | 5.61 |
| Total | 11 | 17 | 303 | 100 |

Table 1 presents volume-wise distribution of research contributions in 17 issues of 11 volumes. It gives the details of 303 contributions published in 2011 to 2021. The highest number of articles i.e. 65(21.45%) was published in 2019 and minimum number of contributions i.e. 14(4.62%). in 2016.

**Table-2. Average number of research contributions in each volume**

| No. of volumes | Total No. of articles | Average |
|---|---|---|
| 8 | 303 | 37.87 |

From Table 2 identified that average number of research contributions in 17 issues of 8 volumes of the source journal is 303 and the average number of research contribution per volume is 37.5.

**Table-.3: Gender wise distribution of article**

| Year | No of Articles | No. of Authors | Male Author | Female Author |
|---|---|---|---|---|
| 2011 | 25 | 52 | 43(82.69) | 9(17.31) |
| 2012 | 27 | 47 | 40(85.1) | 7(14.89) |
| 2013 | 18 | 35 | 33(94.28) | 2(5.71) |
| 2014 | 25 | 51 | 46(94.28) | 5(9.80) |
| 2015 | 14 | 24 | 19(79.17) | 5(20.83) |
| 2016 | 16 | 30 | 26(85.67) | 4(13.33) |
| 2017 | 19 | 38 | 33(86.84) | 5(13.16) |
| 2018 | 60 | 115 | 92(80) | 23(20) |
| 2019 | 65 | 122 | 93(75.22) | 29(23.77) |
| 2020 | 17 | 40 | 37(92.5) | 3(7.5) |
| 2021 | 17 | 40 | 33(82.5) | 7(17.5) |
| **Total** | **303** | 594 | **495(83.33%)** | **99(16.67%)** |

Table-.3 examines that gender wise distribution of article. The findings of the study show that male authors contributing more 495(83.33%) then female authors 99(16.67%). Males authors are dominance compare to female authors and also need the awareness program for female authors to write more and more articles.

**Table.4: Subject-wise contributions of research articles in various field of LIS**

| Sl NO | Subject | No of Article | % |
|---|---|---|---|
| 1 | Foundation of Libraries | 39 | 12.87 |
| 2 | Management of Libraries | 17 | 4.62 |
| 3 | Information Sources and Services | 7 | 3.3 |
| 5 | User education and User Study | 127 | 38.62 |
| 6 | Information Retrieval System | 6 | 1.98 |
| 9 | Information Communication Technology in libraries | 30 | 9.9 |

| | | | |
|---|---|---|---|
| 10 | Metrics Study | 75 | 24.75 |
| 12 | Marketing of Library Information Products and Services | 8 | 2.64 |
| 13 | Others | 4 | 1.32 |
| | **Total** | **303** | **100** |

The table4 shows that Subject-wise contributions of research articles in various field of LISc. Out of 303 contributions, highest numbers of contributions are from the field of user education and user study with 127 (38.62%) contributions. Followed by metrics study with 75(24.75%) contribution etc.

**Table-.5: Authorship pattern of Contribution**

| No of author | No of research contribution | Percentage |
|---|---|---|
| One | 78 | 25.74 |
| Two | 173 | 57.10 |
| Three | 40 | 13.20 |
| More than three | 12 | 3.96 |
| Total | 303 | 100 |

Table.5 represent the authorship pattern of contribution. A total of 303 contributions were classified into four groups. 78(25.74%) contribution out of 303 have been contributed by single author, 173(57.10%) research contribution by two authors and 40 contributions by three authors and 12(3.96%) contribution were more than three authors.

**Table-.6: Length of articles in year wise**

| Year | Volume | No of Pages | | | | Total Number of Pages | Average Page Per Article |
|---|---|---|---|---|---|---|---|
| | | 1-5 | 6-10 | More than 10 | Total | | |
| 2011 | 1 | 9 | 15 | 1 | 25 | 148 | 5.92 |
| 2012 | 2 | 22 | 5 | 0 | 27 | 134 | 4.96 |
| 2013 | 3 | 10 | 8 | 0 | 18 | 97 | 5.39 |

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| 2014 | 4 | 15 | 9 | 1 | 25 | 141 | 5.64 |
| 2015 | 5 | 5 | 7 | 2 | 14 | 99 | 7.07 |
| 2016 | 6 | 8 | 8 | 0 | 16 | 91 | 5.69 |
| 2017 | 7 | 9 | 9 | 1 | 19 | 113 | 5.95 |
| 2018 | 8 | 33 | 26 | 1 | 60 | 332 | 5.53 |
| 2019 | 9 | 51 | 14 | 0 | 65 | 327 | 5.03 |
| 2020 | 10 | 7 | 10 | 0 | 17 | 110 | 6.47 |
| 2021 | 11 | 3 | 12 | 2 | 17 | 120 | 7.06 |
| Total | | 172(56.76%) | 123(40.60%) | 8(2.64%) | 303 | 1712 | 5.65 |

Table.6 indicates the length of article in year wise. Out of 303 contributions, 172(56.76%) contributions have page length of 1-5 pages. Followed by 123(40.60%) contribution have the length of 6-10 pages and finally 8(2.64%) have the length of more than 10 pages.

**Table -.7: Geographical distribution of article**

| Sl. No. | Name of the State/Country | No. of Publications | % |
|---|---|---|---|
| 1 | Tamilnadu | 274 | 46.28 |
| 2 | Karnataka | 113 | 19.08 |
| 3 | West Bengal | 33 | 5.57 |
| 4 | Kerala | 24 | 4.05 |
| 5 | Uttar Pradesh | 15 | 2.53 |
| 6 | Andra Pradesh | 13 | 2.19 |
| 7 | Gujarat | 7 | 1.18 |
| 8 | Haryana | 7 | 1.18 |
| 9 | Assam | 4 | 0.68 |
| 10 | Jammu and Kashmir | 4 | 0.68 |
| 11 | Odissa | 4 | 0.68 |
| 12 | Pandichery | 4 | 0.68 |

| | | | |
|---|---|---|---|
| 13 | Rajasthan | 4 | 0.68 |
| 14 | Mizoram | 3 | 0.51 |
| 15 | Madhya Pradesh | 3 | 0.51 |
| 16 | Newdelhi | 3 | 0.51 |
| 17 | Chattisghad | 2 | 0.34 |
| 18 | Meghalaya | 2 | 0.34 |
| 19 | Punjab | 2 | 0.34 |
| 20 | Telangana | 2 | 0.34 |
| 21 | Uttarkand | 2 | 0.34 |
| 22 | Arunachal Pradesh | 1 | 0.17 |
| 23 | Himachal Pradesh | 1 | 0.17 |
| 24 | Manipur | 1 | 0.17 |
| 25 | Maharashtra | 1 | 0.17 |
| 26 | Foreign countries | 63 | 10.64 |
| | Total | 592 | 100 |

Table 7 provides the Geographical distribution of research contributions, the highest number of contribution has been contributed by authors in Tamilnadu with 274 (46.28%) and the lowest number of contribution were contributed by Himachalpradesh, Maharashtra and Manipur with 1(0.17%) and 63(10.64) contribution from foreign countries i.e. Bangladesh, Nigeria and Srilanka.

# 6Conclusion

Scientometric analysis is an important field metrics analysis. This techniques are used for a variety of purposes, such as determining various scientific indicators, evaluating scientific output, The analysis shows that the highest number of articles is 65(21.45%) in 2019 followed by 60(19.80%) article in 2018. The average number of research contribution per volume is 37.87. The majority of the contribution is from male authors and majority of the contribution from User education and User study. The majority of the contributions in the journals are multi-authored and contributed from Tamilnadu. The maximum numbers of contributions have the length of 1-5 pages with 172(56.76%).

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# Authorship Pattern and Degree of Collaboration in Mechanical Engineering Publications

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**Abstract**

*The paper presents a study of the authorship pattern and collaborative research in the field of Mechanical Engineering. The required data collected from 125 Ph. D theses submitted to Jawaharlal Nehru Technological University, Hyderabad are used as source material for the present investigation. The study collected data included 11841 citations, among theses only journal citations are considered for the study, which were appended to the 125 theses. Total 4998 journal citations came out and were utilized for the present investigation. Predominance of multi-authored papers over single authored papers is seen. the degree of collaboration of journal article citations in Mechanical Engineering as a whole is 0.75. The corresponding figures for Machine Design/Mechanical Design, Production Engineering, and Thermal Engineering are 0.73, 0.75 and 0.75 respectively.*

**Keywords**: *Authorship pattern, Degree of collaboration, Mechanical Engineering*

## 1. Introduction

The study of authorship pattern and productivity is an important factor in citation analysis. Generally, authorship of a paper or document has become important for scientists and researchers. In order to make out the author productivity and authorship pattern, the analysis of the nature of research collaboration in research activity is primary factor. Collaborative research activity is a well recognized feature of modern science, and there has been a consistent trend towards increased collaboration in all branches of science during the present century. Studies on evaluation of academic productivity and quality have led to development of research productivity of a specific nation. Bibliometric studies may

be broadly classified into two main groups-descriptive and behavioral studies. Descriptive studies are those which confine themselves to describing the characteristics or the features of a document or literature Degree of collaboration in respect of a discipline in an organization is the ratio of multi-authored papers published during a year and the total number of papers published during the year. This study especially focuses on the authorship patterns and degree of collaboration of research in mechanical engineering literature based on an analysis of Ph.D. theses submitted to Jawaharlal Nehru Technological University, Hyderabad for the award of doctoral degree.

## 2. Review of Literature

Pandey & Shaoo (2020) investigated the research collaborations and authorship patterns in the field of semantic digital libraries (SDL). The data is extracted from the Scopus database using keywords related to semantic digital libraries by considering all types of publications during 1983-2019.The study found that the average degree of collaboration of 0.898 indicates that a large number of publications are multi-authored and that there is a higher level of collaborative research in the field of semantic digital libraries.

Yadav, Singh & Verma (2019) conducted a study on an evaluation of authorship and collaboration pattern in SRELS Journal of Information Management during 2008-2017. Total 578 articles published during the study period out of which 196 articles are published by single author and rest 386 articles are published by two or more than two authors. It is clear from the study that multiple authorship pattern is prominent in the journal. In the study it has been counted that the average collaboration index is 1.86, average collaboration coefficient is 0.36, average degree of collaboration is 0.66, average relative growth rate is 0.32 and average doubling time is 3.40 during 2008-2017. The highest activity index for India is counted in the year 2009 and lowest activity index is counted in the year 2013.

Patil (2019) presents the trends in authorship pattern and authors collaborative research in Astrophysics. The study reveals that multiple authored articles are dominant. The mean value for the overall degree of collaboration for the 2008-2017 is found to be 0.67, the collaboration index increased from 5.18 in 2008 to 8.22 in 2017 with an average of 4.00. The collaborative co-efficient for the year 2008 is 0.51 which increased gradually to 0.54 in 2017 with an average of 0.49.

Rajgoli & Laxminarsaiah. (2015) investigated the authorship pattern and collaborative research in the field of spacecraft technology. The study reveals that

4,355 authors have contributed 1,907 papers. *Journal of Spacecraft and Rockets* has published maximum (1,487) number of papers during the study period. Multi-authored papers with 87.15 per cent of contributions have dominated this field of research. *Journal of Spacecraft Technology* has recorded highest degree of collaboration of 0.90.

## 3. Scope and objectives

The scope of the study is limited to three major sub-fields of Mechanical Engineering viz., Thermal Engineering, Machine Design and Production Engineering. One hundred and twenty five Ph.D. theses are available in the University library of Jawaharlal Nehru Technological University, Hyderabad. A total of 11,841 citations appended to these theses, among them 4, 998 journal citations are identified and these form the basis for the study.

i. The objectives of the present study are:
ii. Nature of authorship pattern in the literature of mechanical engineering, thermal engineering, machine design and production engineering,
iii. The ratio of single Vs multi-authored papers in mechanical engineering, thermal engineering, machine design and production engineering, and
iv. Degree of collaboration in mechanical engineering, thermal engineering, machine design and production engineering.

## 4. Methodology

The present study is concerned with the analysis of journal citations appended to the doctoral theses accepted in the field of Mechanical Engineering for the award of doctoral degrees by Jawaharlal Nehru Technological University, Hyderabad. The information relating to each citation, i.e., number of authors, bibliographic form, name of the journal, year of publication are recorded. The journal information regarding the country, language and the subject of the journal are obtained from 'Ulrich's International Periodicals Directory' and recorded on the reference cards of standard size of 12.5 X 7.5 cm. The data is fed into the computer using MS-Excel software and the Statistical Package for Social Sciences (SPSS) for analysis.

## 5. Data Analysis

The present study elucidates the authorship pattern and degree of collaboration in journal citations in the field of Mechanical Engineering as a whole and sub-fields of Thermal Engineering, Machine Design and Production Engineering.

### 5.1 Authorship pattern

**Table 1: Authorship pattern of mechanical engineering, thermal engineering, machine design and production engineering**

| S.No | Name of the Branch | Authorship pattern | | | | Total |
|---|---|---|---|---|---|---|
| | | Single | Double | Three | More than three | |
| 1 | Mechanical Engineering | 1169 (25.39) | 1878 (37.58) | 1023 (20.47) | 828 (16.56) | 4998 (100.00) |
| 2 | Machine Design | 178 (26.73) | 281 (42.19) | 137 (20.57) | 70 (10.51) | 666 (100.00) |
| 3 | Production Engineering | 509 (24.91) | 705 (34.51) | 411 (20.12) | 418 (20.46) | 2043 (100.00) |
| 4 | Thermal Engineering | 582 (25.43) | 892 (38.97) | 475 (20.75) | 340 (14.85) | 2289 (100.00) |

Table 1 shows that out of 4998 journal citations in mechanical engineering, 1269 (25.39%) citations were contributed by single authors, 1878 (37.58%) by double authors, 1023 (20.47%) by three authors, and 828 (16.56%) by more than three authors.

Regarding in the field of machine design, out of 666 journal citations, 178 (26.73%) citations were contributed by single authors, 281 (42.19%) by double authors, 137 (20.57%) by three authors, and 70 (10.51%) by more than three authors.

Regarding in the field of production engineering, out of 2043 journal citations, 509 (24.91%) citations were contributed by single authors, 705 (34.51%) by double authors, 411 (20.12%) by three authors, and 418 (20.46%) by more than three authors.

Regarding in the field of thermal engineering, out of 2289 journal citations, 582 (25.43%) citations were contributed by single authors, 892 (38.97%) by double authors, 475 (20.75%) by three authors, and 340 (14.85%) by more than three authors.

It can be concluded that majority of the journal citations in mechanical engineering as a whole and its sub-fields of machine design, production engineering and thermal engineering are contributed by multiple authors.

### 5.2 Single Vs Multiple Authorship Pattern of Journals

Single Vs Multiple authorship pattern of journals in Mechanical Engineering and its sub-fields of Machine Design/Mechanical Design, Production Engineering and Thermal Engineering are displayed in Table 2.

**Table 2: Single Vs Multiple Authorship Pattern of Journal Citations**

| Subject / Specialization | Single Authors | | Multiple Authors | | Total |
|---|---|---|---|---|---|
| | Number | % | Number | % | |
| Mechanical Engineering | 1269 | 25.49 | 3729 | 74.61 | 4998 (100.00) |
| Machine Design | 178 | 26.73 | 488 | 73.27 | 666 (100.00) |
| Production Engineering | 509 | 24.91 | 1534 | 75.09 | 2043 (100.00) |
| Thermal Engineering | 582 | 25.43 | 1707 | 74.57 | 2289 (100.00) |

It is obvious from Table 2 that the analysis of journal citations in Mechanical Engineering and its sub fields of Machine Design, Production Engineering and Thermal Engineering, in relation to the number of authors, reveal a more or less similar authorship pattern. The multiple authored journal articles are cited more in number when compared to single authored journal articles. The number of multiple authored journal articles indicates that with collaborative nature of research is growing in mechanical engineering.

### 5.3 Degree of collaboration

To determine the extent of collaboration in quantitative terms, the Degree of Collaboration formula given by Subramanyam[3] (1982):

**C= Nm/ Nm+Ns,** Where C= Degree of Collaboration
Nm = Number of Multi authored contributions
Ns = Number of Single authored contributions

### 5.3.1 Degree of collaboration of journal article citations

The degree collaboration journal article citations in Mechanical Engineering and its sub-fields of machine design, production engineering and thermal engineering is displayed in Table 3.

**Table 3: Degree of Collaboration of journal article citations**

| Name of the Subject | Degree of collaboration |
|---|---|
| Mechanical Engineering | 0.75 |
| Machine Design/Mechanical Design | 0.73 |
| Production Engineering | 0.75 |
| Thermal Engineering | 0.75 |

Table 3 shows that the degree of collaboration of journal article citations in Mechanical Engineering as a whole is 0.75. The corresponding figures for Machine Design/Mechanical Design, Production Engineering, and Thermal Engineering are 0.73, 0.75 and 0.75 respectively.

## 6. Findings

1. Analysis of citations in Mechanical Engineering and its sub-fields, in relation to the number of authors, reveals a more or less similar authorship pattern.
2. The multi- authored papers are more in number (74.61%) and single authored papers are 25.49%of total journal citations.
3. The number of collaborative papers indicates that the collaborative nature of research is growing.
4. The degree of collaboration (calculated using the formula given by Subramanyam) in Mechanical Engineering as a whole is 0.75. The corresponding figures for machine design, production engineering and thermal engineering are 0.73, 0.75 and 0.75.

## 7. Conclusion

The degree of author collaboration in the mechanical engineering literature is demonstrated in this study. This research, in particular, demonstrates a clear increase in collaborative mechanical engineering research, with the findings of these research efforts published in all major core mechanical engineering publications. This study concludes that collaborative research is the way to go. The growing number of joint articles implies that research is becoming more collaborative. It may be concluded that the findings of this type of study have a lot of potential in terms of library journal collection management. The interdisciplinary character of investigations, rising costs of instruments and laboratory facilities, and scientists' shared interests in the same topic disciplines are all factors that contribute to collaborative research.

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# Scientometric study of Doctoral Dissertations in Physics in Acharya Nagarjuna University, Guntur, Andhra Pradesh

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**Abstract**

*The purpose of the study is to assess the research trends in physics to derive meaningful inferences to support information needs of scientists, economists, policymakers, librarians and other stakeholders. The study uses for data the theses in Physics accepted for the degree of Doctorate of Philosophy by Achraya Nagarjuna University, Guntur. The data analysis of the various parameters such bibliographic forms, authorship pattern of books and journals, chronological citations, publisher's wise citations, country wise, degree of collaboration etc.*

**Key words**: *Scientometric, Physics, Citation analysis, Degree of collaboration*

## INTRODUCTION

Citation analysis deals with the analysis and assessment of the various patterns in which references from books and articles are cited, along with their rate of recurrence. Researchers employ citations in academic works for connecting to the other works as well as other researchers. In essence, citation analysis studies the nature, relevance and quality of relationships that the cited documents share with the citing documents. A cited document refers to the source of a reference as shown by the author as a part of his work, while the document that makes references of other documents is known as a citing document. Therefore, citation analysis broadly encompasses the analysis of a spectrum of citations emanating from and into the documents, appended into the research communication with the count of citations. In general, the citations appear at the bottom of a scientific article along with its number, which is known as citation analysis. In fact, citation analysis offers important perspectives into the relevance and influence of the scholars as well as their work on other prospective researchers based on the frequency, mode and quantum of references.

## OBJECTIVES

The objectives of the present study are:

- To know the various sources of information consulted by the researchers in physics;
- To examine the authorship pattern of books and journals;
- To examine the year-wise cited books and journals in physics
- To know the type of publishers of citations of books and journals cited in physics
- To know the geographical scattering of citations in physics.

## MATERIALS AND METHODS

The data for the present study was collected from Ph.D. theses in Physics which is available in Acharya Nagarjuna University, Guntur, Andhra Pradesh. There are 12038 citations in these theses. The average number of citations per theses is nearly 301. All these citations were noted down on slips as they cared in the theses They are analysed according to the objectives as sated above. Further, 'Ulrich's International Periodical Directory' was referred to for knowing the country and the subject of the cited journals.

## RESULTS AND DISCUSSION

### *Bibliographic forms*

Table 1 shows the distribution of citations according to the different bibliographic forms in Physics.

**Table 1: Distribution of citations according to the different bibliographic forms in Physics**

| Bibliographic forms | Number of Citations | Percentage |
|---|---|---|
| Books | 1369 | 11.37 |
| Conferences/seminars/ workshops/ Conventions etc. | 82 | 0.68 |
| Journals | 10460 | 86.89 |
| Newspapers | 14 | 0.12 |
| Patents | 09 | 0.07 |
| Reports/Reviews | 18 | 0.15 |
| Theses/Dissertations | 27 | 0.22 |
| Websites | 21 | 0.18 |
| Others | 38 | 0.32 |
| **TOTAL** | **12038** | **100.00** |

Table 1 shows that the distribution of citations among different bibliographic forms in Physics. It is evident from the table that the journals contribute the highest number of citations accounting for 86.89 percent of total citations. Books secured second highest number of citations accounting for 11.37 percent of total citations, followed by conference/seminars/workshops/conventions etc. (0.68%), theses/dissertations (0.22%), websites (0.18%), reports/reviews (0.15%), newspapers (0.12%), and patents (0.07%). The remaining 0.32 percent of citations are from other bibliographic forms. Hence, it can be concluded that the journals are the most information resources are cited by the researchers in physics subject literature.

***Authorship pattern of books***

Table 2 shows the distribution of citations of books according to the number of authors in Physics.

**Table 2: Distribution of citations of books according to the number of authors in Physics**

| Number of authors | Number of Citations | Percentage |
|---|---|---|
| Single | 825 | 60.26 |
| Double | 341 | 24.91 |
| Three | 147 | 10.74 |
| More than Three | 56 | 4.09 |
| **TOTAL** | **1369** | **100.00** |

It is evident from the Table 2 that the authorship pattern of citations of books in Physics subject according to the number of authors. It indicates that out of 1369citations, 825 (60.26%) were contributed by single authors, 341 (24.91%) by two authors, 147 (10.74%) by three authors, and 56 (4.09%) by more than three authors. It can be concluded that majority of the books are cited by solo authored books.

***Authorship pattern of journals***

Table 3 shows the distribution of citations of journals according to the number of authors in Physics.

**Table 3: Distribution of citations of journals according to the number of authors in Physics**

| Number of authors | Number of Citations | Percentage |
|---|---|---|
| Single | 1510 | 14.44 |
| Double | 2805 | 26.82 |
| Three | 2387 | 22.82 |
| More than Three | 3758 | 35.92 |
| **TOTAL** | **10460** | **100.00** |

It is evident from the Table 3 that the authorship pattern of citations of journal articles in Physics subject according to the number of authors. It indicates that out of 10460 citations, 3758 (35.92%) were contributed by more than three authors, 2805 (26.82%) by two authors, 2387(22.82%) by three authors, and 1510 (14.44%) by single authors. It can be concluded that majority of the journals are cited by collaborative authored articles.

***Year-wise cited books in Physics***

Table 4 shows the distribution of citations of books according to the year of publication in Physics.

**Table 4: Distribution of citations of books by year of publication in Physics**

| Year of Publication | Books | |
|---|---|---|
| | Number | Percent age |
| Before 1950 | 32 | 2.34 |
| 1951-1960 | 50 | 3.65 |
| 1961-1970 | 233 | 17.02 |
| 1971-1980 | 253 | 18.48 |
| 1981-1990 | 248 | 18.12 |
| 1991-2000 | 308 | 22.50 |
| 2001-2010 | 228 | 16.65 |
| After 2011 | 17 | 1.24 |
| **TOTAL** | **1369** | **100.00** |

It is evident from the Table 4 that the distribution of citations of books by year wise publication in Physics literature is incorporated. It indicates that out of 1369 citations,308 (22.50%) were published during the period of 1991-2000,

253(18.48%) were during the period of 1971-1980, 248 (18.12%) were during the period of 1981-1990, 233 (17.02%) were during the period of 1961-1970, 228 (16.65%) were during the period of 2001-2010, 50 (3.65%) were during the period of 1951-1960, 32 (2.34%) citations were published during the period of before 1950, and17 (1.24%) citations were published during the period of after 2011. Hence, it can be concluded that more than half of the citations of books were published between 1971 and 2010.

**Year-wise cited journals articles in Physics**

Table 5 shows the distribution of citations of journal articles according to the year of publication in Physics.

**Table 5: Distribution of journal articles by year of publication in Physics**

| Year of Publication | Journals | |
|---|---|---|
| | Number | Percent age |
| Before 1950 | 273 | 2.61 |
| 1951-1960 | 299 | 2.86 |
| 1961-1970 | 566 | 5.41 |
| 1971-1980 | 665 | 6.36 |
| 1981-1990 | 1133 | 10.83 |
| 1991-2000 | 1867 | 17.85 |
| 2001-2010 | 4884 | 46.69 |
| After 2011 | 773 | 7.39 |
| **TOTAL** | **10460** | **100.00** |

It is evident from the Table 5 that the distribution journal article of citations by year wise publications in Physics literature is incorporated. It indicates that out of 10460 citations,4884 (46.69%) were published during the period of 2001-2010, 1867(17.85%) were published during the period of 1991-2000, 1133 (10.83%) were published during the period of 1981-1990, 773 (7.39%) were published during the period of after 2011, 665 (6.36%) were published during the period of 1971-1980, 566 (5.41%) were published during the period of 1961-1970, 299 (2.86%) were published during the period of 1951-1960, and 273 (2.61%) citations were published during the period of before 1950. Hence, it can be concluded that nearly half of the citations of journal articles were published between 1991 and 2010 and nearly 75.37 percent of journal articles are cited during the recent decades.

***Type of publishers in Books***

In order to ascertain whether the choice of preferences of Physics researchers towards the books published by Indian publishers or International publishers, the cited books were divided into two groups namely Indian publishers and Foreign publishers, basing on the place of publication.

Table 6 shows the distribution of citations of books cited in Physics according to the type of publisher.

**Table 6: Distribution of citations of books in physics according to the type of publisher**

| Type of Publisher | Books | |
|---|---|---|
| | Number | Per cent age |
| Indian | 518 | 37.84 |
| Foreign | 851 | 62.16 |
| **TOTAL** | **1369** | **100.00** |

It is evident from Table 6 most of the cited books in physics (62.16%) were published by foreign publishers and the remaining 37.84 percent of books were published by Indian publishers. Hence, it can be concluded that the researchers in Physics are cited the large number of books published by foreign publishers.

***Type of publishers in Journals***

In order to ascertain whether the choice of preferences of physics researchers towards the articles published by Indian journals or International journals, the cited journals articles were divided into two groups namely Indian journals and International journals, basing on the place of publication of the journals.

Table 7 shows the distribution of citations of journals articles cited in Physics.

**Table 7: Distribution of citations of journals articles in physics according to the type of journal**

| Type of Journal | Journals | |
|---|---|---|
| | Number | Per cent age |
| Indian | 534 | 5.11 |
| Foreign | 9926 | 94.89 |
| **TOTAL** | **10460** | **100.00** |

It is evident from Table 7 most of the cited articles in physics (94.89%) were published in foreign journals and the remaining 5.11 percent of articles were published in Indian journals. Hence, it can be concluded that the researchers in Physics are cited the large number of articles published in foreign journals.

***Geographical scattering of book citations in Physics***

Table 8 shows the distribution of citations of books cited in Physics according to the country wise.

**Table 8: Geographical scattering of citations of books in Physics**

| Country | Citations | |
|---|---|---|
| | **Number** | **Per cent age** |
| India | 518 | 37.84 |
| USA | 281 | 20.53 |
| UK | 163 | 11.91 |
| Japan | 38 | 2.77 |
| Germany | 27 | 1.97 |
| Canada | 25 | 1.83 |
| Australia | 21 | 1.53 |
| Netherlands | 20 | 1.46 |
| Bangladesh | 19 | 1.39 |
| Singapore | 18 | 1.31 |
| Iran | 17 | 1.24 |
| Italy | 16 | 1.17 |
| Switzerland | 11 | 0.80 |
| Srilanka | 09 | 0.66 |
| New Zealand | 09 | 0.66 |
| Pakistan | 05 | 0.37 |
| China | 05 | 0.37 |
| Unidentified | 167 | 12.20 |
| **TOTAL** | **1369** | **100.01** |

It is evident from Table 8 that the country wise distribution of citations of books in Physics. The country wise distribution of cited literature in Physics reveals the results that the India occupies first place with 37.84 percent of total citations. USA occupies second place with 20.53 percent of total citations. UK got the third place 11.91 percent of total citations, followed by Japan (2.77%), Germany, (1.97%), Canada (1.83%), Australia (1.53%), Netherlands (1.46%), Bangladesh

(1.39%), Singapore (1.31%), Iran (1.24%), Italy (1.27%), Switzerland (0.80%), Srilanka (0.66%), Newzealand (0.66%), Pakistan (0.378%), and China (0.37%). The remaining 12.20 percent of citations are unidentified.

### *Geographical scattering of journals citations in Physics*

Table 9 shows the distribution of citations of journal articles cited in Physics according to the country wise.

**Table 9: Geographical scattering of citations of journals in Physics**

| Country | Citations | |
|---|---|---|
| | Number | Percentage |
| Netherland | 4281 | 40.93 |
| USA | 3364 | 32.16 |
| UK | 1381 | 13.20 |
| India | 534 | 5.10 |
| Germany | 178 | 1.70 |
| China | 177 | 1.69 |
| Europe | 136 | 1.30 |
| Japan | 111 | 1.06 |
| Canada | 45 | 0.43 |
| Spain | 31 | 0.30 |
| Poland | 28 | 0.27 |
| Russia | 27 | 0.26 |
| Switzerland | 19 | 0.18 |
| Singapore | 17 | 0.16 |
| France | 13 | 0.12 |
| Paris | 12 | 0.11 |
| Egypt | 7 | 0.07 |
| South Korea | 6 | 0.06 |
| Australia | 5 | 0.05 |
| Kazakhstan | 5 | 0.05 |
| Korea | 5 | 0.05 |
| USSR | 5 | 0.05 |
| Brazil | 4 | 0.04 |
| Iron | 4 | 0.04 |
| Malaysia | 3 | 0.03 |
| Roman | 3 | 0.03 |
| Srilanka | 3 | 0.03 |

| | | |
|---|---|---|
| Africa | 2 | 0.02 |
| Italy | 2 | 0.02 |
| Other countries | 52 | 0.49 |
| **TOTAL** | **10460** | **100.00** |

It is evident from Table 9 that the country wise distribution of citations of journals in Physics. The country wise distribution of cited journal article literature in Physics reveals the results that the Netherlands occupies first place with 40.93 percent of total citations. USA occupies second place with 32.16 percent of total citations. UK got the third place 13.20 percent of total citations, followed by India (5.10%), Germany, (1.70%), China (1.69%), Europe (1.30%), Japan, (1.06%), Canada (0.43%), Spain (0.30%), Poland (0.27%), Russia (0.26%), Switzerland (0.18%), Singapore (0.16%), France (0.12%), Paris (0.11%), Egypt (0.07%). The remaining 0.96 percent of citations are other countries.

***Single authorship Vs Multiple authorship in Physics***

Single authorship Vs Multiple authorship of books and journals in physics subject is shown in Table 10.

**Table 10: Single authorship Vs Multiple Authorship of books and journals in Physics**

| Type of Form | Single authors | Multiple Authors | Total |
|---|---|---|---|
| | Number | Number | |
| Books | 825 (60.26%) | 544 (39.74%) | 1369 (100.00%) |
| Journals | 1510 (14.44%) | 8950 (85.56) | 10460 (100.00) |

Table 10 shows that the analysis of books and journals citations in physics, in relation to the number of authors. The multiple authored papers are more in number when compared to single authored papers in journals, whereas in books the individual authored papers are more in number compared to multiple authored papers.

**Degree of collaboration in Physics**

It is clear from the analysis that the percentage of multiple authored papers is more than that of single authored papers. To determine the extent of collaboration in quantitative terms, the Degree of Collaboration formula is:

**C= Nm/ Nm+Ns,** Where C= Degree of Collaboration
Nm = Number of Multi authored contributions
Ns = Number of Single authored contributions

**Table 11: Degree of Collaboration of books and journal article citations in physics**

| Type of form | Degree of collaboration |
|---|---|
| Books | 0.40 |
| Journals | 0.85 |

Table 11 shows that the degree of collaboration of books and journal article citations in Physics. The degree of collaboration books in Physics is 0.40 and journals are 0.85.

## CONCLUSIONS

An analysis of 12038 citations appended to Ph.D. theses in Physics reveals the following conclusions.

- The analysis of citations according to the bibliographic forms reveals that the journals (86.89%) and books (11.37%) are the most preferred information resources are cited by the researchers in Physics and these are secured first and second places respectively.
- Analysis of citations of books in Physics, in regarding to the authorship pattern, reveals that the majority of the books are cited by individual authored (64.42%) when compared to multi-authored books.
- Analysis of citations of journal articles in physics regarding to the authorship pattern, reveals that the majority of the journal articles are cited by multi authored (85.56%) when compared to individual authored journals articles.
- Out of 1369 citations of books in Physics, 308 (22.50%) were published during the period of 1991-2000.
- Out of 10,460 citations, 4884 (46.69%) were published during the period of 2001-2010.
- Most of the cited books in physics (62.16%) were published by foreign publishers and the remaining 37.84 percent of books were published by Indian publishers.
- Most of the cited articles in physics (94.89%) were published in foreign journals and the remaining 5.11 percent of articles were published in Indian journals.

- The country wise distribution of cited literature in Physics reveals the results that the India occupies first place with 37.84 percent of total citations.
- The country wise distribution of cited journal article literature in Physics reveals the results that the Netherlands occupies first place with 40.93 percent of total citations.
- The collaboration of books and journal article citations in Physics, reveals that the degree of collaboration books in Physics is 0.40 and journals is 0.85.

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# LITERATURE IN THE FIELD OF ENDODONTICS : THE STUDY BASED ON METRIC ANALYSIS

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## Abstract

*This paper presents a metric analysis of the literature in the field of Endodontics in MEDLINE data which has been covered in the PubMed during the study period i.e. from the yearn 1999 to 2018.It has been found that a total of 22464 records in the field of Endodontics. The Maximum number of records (1893) was published during the year 2017.It was found that62.67% were journal articles. Relative Growth Rate(RGR) was decreasing trend and the Doubling Time (Dt) was increasing trend except for a few years. Forty-Three journals have been identified as core journals in the field of Endodontics. It is found that the United States published eleven core journals (25.58%) out of Forty-Three core journals in the first position India published eight core journals (18.60%) in the second position.*

**Keywords:** *Endodontics, Bibliometrics, Growth Rate (RGR), Doubling time (Dt), and Bradford's law*.

## INTRODUCTION:

This paper presents a metric analysis of the literature in the field of Endodontics in MEDLINE data which has been covered in the PubMed during the study period i.e. from the year 1999 to 2018. There are a number of bibliometric techniques available in the Library and Information Science. Bibliometric techniques i.e. Growth Rate (RGR), Doubling time (Dt), and Bradford's law of scattering have been used in this study. It helps to identify the growth rate in the field of Endodonticsand also helps to identify the core journals in the field of Endodontics.

## REVIEW OF LITERATURE:

Growth rates in scientific areas studied by different authors in different fields of studies[1-5]and also there is the number of studies conducted on Bradford's Law in different fields of studies[6-10]. They used Bradford's law of scattering to identify core journals.

## ENDODONTICS:

Endodontic includes the study of the basic and clinical sciences of normal dental pulp, the etiology, diagnosis, prevention, and treatment of diseases and injuries of the dental pulp along with associated periradicular conditions.[11]

## OBJECTIVES OF THE STUDY:

The Objectives of this study are:

1. To study the Quantum of literature published in the field of Endodontics.
2. To examine the publication types of literature in the field of Endodontics.
3. To study the growth of literature in the field of Endodontics; and
4. To identify the core journals in the field of Endodontics.

## METHODOLOGY:

The records published during the year 1999 to 2018 in the field of Endodontics in MEDLINE data which has been covered in the PubMed (www.pubmed.com) were collected. The records were converted into FoxPro and loaded in SPSS for the purpose of analysis. The keyword 'Endodontics' has been used for extracting the number of records available. The records collected from the source database on the literary production of 'Endodontics' has been analysed by using metric techniques. The data were analyzed in terms of growth rate and core journals in the field of Endodontics. To determine the growth rate, the bibliometric techniques like Relative Growth Rate (RGR)[12]and Doubling time (Dt)[13] have been used. Bradford Law[14]has been used to bring the core journals in the field of Endodontics.

## QUANTUM OF ENDODONTICS RESEARCH PRODUCTIVITY:

The research productivity on 'Endodontics' covered in the database is displayed in Table-1. It has been noticed that 22464records in the field of Endodontics for a period of twenty years from the year 1999 to 2018. It is found that the maximum number of records (1893) was published during the year 2017, followed by 1885 records in the year 2016 and 1855 records in the year 2014. It is noticed from the analysis that from the year 1999 onwards there is a gradual increase in Endodontics research productivity every year except for a few years.

**Table-1: Quantum of Literature published in the field of Endodontics**

| S.No. | Year | No. of Records | % | Cumulative No. of Records | Cumulative % |
|---|---|---|---|---|---|
| 1 | 1999 | 478 | 2.13 | 478 | 2.13 |
| 2 | 2000 | 526 | 2.34 | 1004 | 4.47 |
| 3 | 2001 | 532 | 2.37 | 1536 | 6.84 |
| 4 | 2002 | 619 | 2.76 | 2155 | 9.59 |
| 5 | 2003 | 635 | 2.83 | 2790 | 12.42 |
| 6 | 2004 | 695 | 3.09 | 3485 | 15.51 |
| 7 | 2005 | 737 | 3.28 | 4222 | 18.79 |
| 8 | 2006 | 832 | 3.70 | 5054 | 22.50 |
| 9 | 2007 | 899 | 4.00 | 5953 | 26.50 |
| 10 | 2008 | 1088 | 4.84 | 7041 | 31.34 |
| 11 | 2009 | 1038 | 4.62 | 8079 | 35.96 |
| 12 | 2010 | 1153 | 5.13 | 9232 | 41.10 |
| 13 | 2011 | 1182 | 5.26 | 10414 | 46.36 |
| 14 | 2012 | 1229 | 5.47 | 11643 | 51.83 |
| 15 | 2013 | 1493 | 6.65 | 13136 | 58.48 |
| 16 | 2014 | 1855 | 8.26 | 14991 | 66.73 |
| 17 | 2015 | 1854 | 8.25 | 16845 | 74.99 |
| 18 | 2016 | 1885 | 8.39 | 18730 | 83.38 |
| 19 | 2017 | 1893 | 8.43 | 20623 | 91.80 |
| 20 | 2018 | 1841 | 8.20 | 22464 | 100.00 |
| **Total** | | **22464** | **100.00** | | |

## PUBLICATION TYPES DISTRIBUTION OF ENDODONTICS RESEARCH:

Table-2 reveals the distribution of the 'Endodontics' research output according to various publication types of MEDLINE. It has been found that62.67% records are journal articles, 16.61% records are Research Support, Non U.S. Gov't,6.75% records are Review, 4.79% records are Randomized Controlled Trial and 2.70% records are Case Reports. The literature published in other publication typesis6.48%.

## Table-2: Publication Type in the field of Endodontics

| Publication Type | Total | % | Cumulative No. of Records | Cumulative % |
|---|---|---|---|---|
| Journal Article | 14078 | 62.67 | 14078 | 62.67 |
| Research Support, Non U.S. Gov't | 3731 | 16.61 | 17809 | 79.28 |
| Review | 1516 | 6.75 | 19325 | 86.03 |
| Randomized Controlled Trial | 1077 | 4.79 | 20402 | 90.82 |
| Case Reports | 606 | 2.70 | 21008 | 93.52 |
| Systematic Review | 263 | 1.17 | 21271 | 94.69 |
| Research Support, N.I.H., Extramural | 237 | 1.06 | 21508 | 95.74 |
| Letter | 195 | 0.87 | 21703 | 96.61 |
| Comment | 155 | 0.69 | 21858 | 97.30 |
| Research Support, U.S. Gov't, P.H.S. | 114 | 0.51 | 21972 | 97.81 |
| Editorial | 106 | 0.47 | 22078 | 98.28 |
| Research Support, U.S. Gov't, Non P.H.S. | 54 | 0.24 | 22132 | 98.52 |
| Validation Studies | 47 | 0.21 | 22179 | 98.73 |
| News | 34 | 0.15 | 22213 | 98.88 |
| Practice Guideline | 33 | 0.15 | 22246 | 99.03 |
| Meta Analysis | 27 | 0.12 | 22273 | 99.15 |
| Multicenter Study | 27 | 0.12 | 22300 | 99.27 |
| Introductory Journal Article | 23 | 0.10 | 22323 | 99.37 |
| Observational Study | 19 | 0.08 | 22342 | 99.46 |
| Portrait | 19 | 0.08 | 22361 | 99.54 |
| Retracted Publication | 19 | 0.08 | 22380 | 99.63 |
| Interview | 18 | 0.08 | 22398 | 99.71 |
| Congress | 14 | 0.06 | 22412 | 99.77 |
| Published Erratum | 11 | 0.05 | 22423 | 99.82 |
| Historical Article | 5 | 0.02 | 22428 | 99.84 |
| Patient Education Handout | 5 | 0.02 | 22433 | 99.86 |
| Research Support, N.I.H., Intramural | 5 | 0.02 | 22438 | 99.88 |

| | | | | |
|---|---|---|---|---|
| Address | 4 | 0.02 | 22442 | 99.90 |
| Overall | 4 | 0.02 | 22446 | 99.92 |
| Pragmatic Clinical Trial | 4 | 0.02 | 22450 | 99.94 |
| Lecture | 3 | 0.01 | 22453 | 99.95 |
| Video Audio Media | 3 | 0.01 | 22456 | 99.96 |
| Technical Report | 2 | 0.01 | 22458 | 99.97 |
| Book | 1 | 0.00 | 22459 | 99.98 |
| Corrected and Republished Article | 1 | 0.00 | 22460 | 99.98 |
| Dictionary | 1 | 0.00 | 22461 | 99.99 |
| English Abstract | 1 | 0.00 | 22462 | 99.99 |
| Evaluation Studies | 1 | 0.00 | 22463 | 100.00 |
| Twin Study | 1 | 0.00 | 22464 | 100.00 |
| **Total** | **22464** | **100.00** | | |

## RELATIVE GROWTH RATE (RGR) AND DOUBLING TIME (Dt):

The analysis of data in the field of Endodontics has been done with the help of parameters such as Relative Growth Rate (RGR) and Doubling Time (Dt). It is seen from Table-3and Fig. 1that RGR has been decreasing from 2000 (0.74) to 2018 (0.09), except for a few years where RGR has been increased. On the other hand, the Doubling Time (Dt) has shown an increasing trend except for a few years. The data in Table-3 reveals that Doubling time (Dt)has increased from 0.93 in the year 2000 to 7.73 in the year 2018 except few years where Doubling time has decreased. (Fig.1&2)

**Table-3: RGR and Dt for Endodontics Research Output by Year-wise**

| Year | No. of Records | Cumulative Total of Records | $W_1$ | $W_2$ | $1 - 2^{\overline{R}(aa^{-1}\ year^{-1})}$ RGR | Dt(a) |
|---|---|---|---|---|---|---|
| 1999 | 478 | 478 | | 6.17 | | |
| 2000 | 526 | 1004 | 6.17 | 6.91 | 0.74 | 0.93 |
| 2001 | 532 | 1536 | 6.91 | 7.34 | 0.43 | 1.62 |
| 2002 | 619 | 2155 | 7.34 | 7.68 | 0.34 | 2.07 |
| 2003 | 635 | 2790 | 7.68 | 7.93 | 0.25 | 2.73 |

| | | | | | | |
|---|---|---|---|---|---|---|
| 2004 | 695 | 3485 | 7.93 | 8.16 | 0.23 | 3.06 |
| 2005 | 737 | 4222 | 8.16 | 8.35 | 0.19 | 3.68 |
| 2006 | 832 | 5054 | 8.35 | 8.53 | 0.18 | 3.89 |
| 2007 | 899 | 5953 | 8.53 | 8.69 | 0.16 | 4.29 |
| 2008 | 1088 | 7041 | 8.69 | 8.86 | 0.17 | 4.09 |
| 2009 | 1038 | 8079 | 8.86 | 9.00 | 0.14 | 5.06 |
| 2010 | 1153 | 9232 | 9 | 9.13 | 0.13 | 5.31 |
| 2011 | 1182 | 10414 | 9.13 | 9.25 | 0.12 | 5.73 |
| 2012 | 1229 | 11643 | 9.25 | 9.36 | 0.11 | 6.16 |
| 2013 | 1493 | 13136 | 9.36 | 9.48 | 0.12 | 5.63 |
| 2014 | 1855 | 14991 | 9.48 | 9.62 | 0.14 | 5.13 |
| 2015 | 1854 | 16845 | 9.62 | 9.73 | 0.11 | 6.20 |
| 2016 | 1885 | 18730 | 9.73 | 9.84 | 0.11 | 6.42 |
| 2017 | 1893 | 20623 | 9.84 | 9.93 | 0.09 | 7.36 |
| 2018 | 1841 | 22464 | 9.93 | 10.02 | 0.09 | 7.73 |

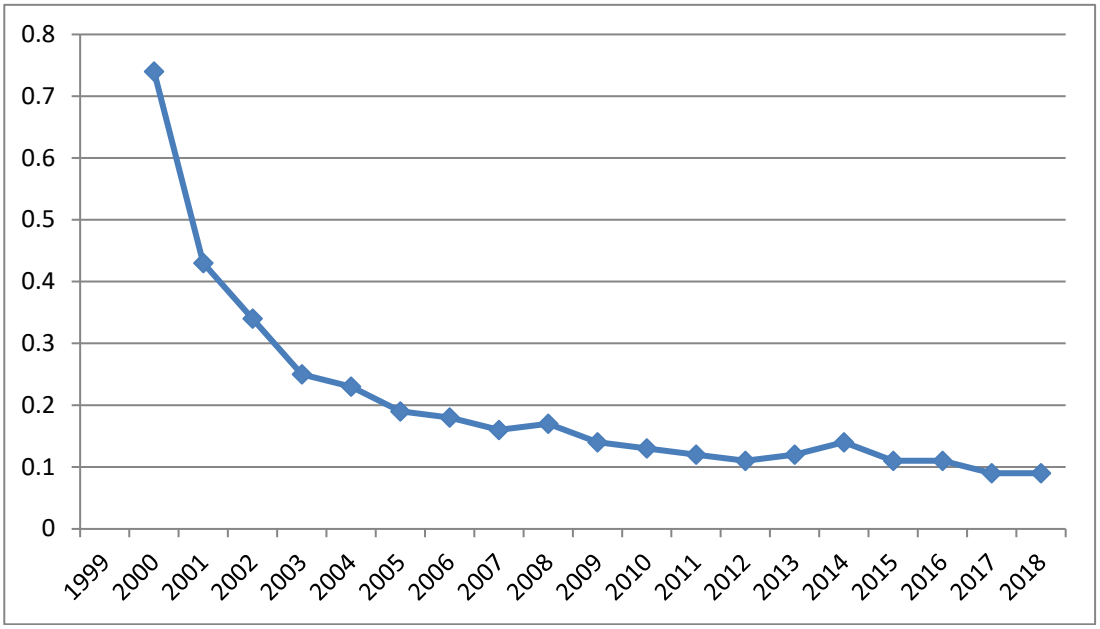



**Figure-1: Relative Growth Rate for Research Output in the field of Endodontics**

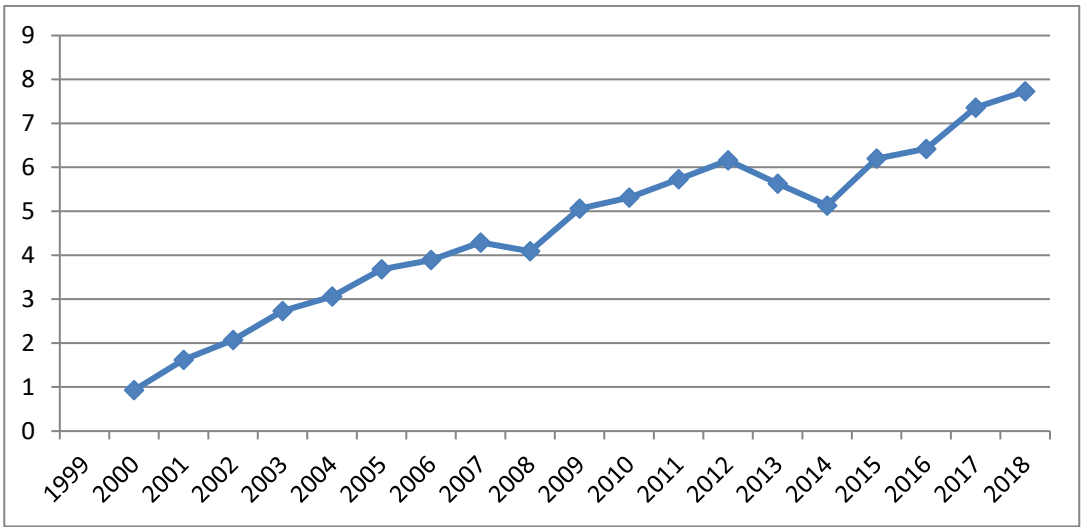



**Figure-2: Doubling time for Research output in the field of Endodontics**

## DISTRIBUTION OF JOURNALS IN THE FIELD OF ENDODONTICS BASED ON BRADFORD LAW OF SCATTERING:

As per the Bradford Law, 14078 journal articles have been selected for this study. The journals are grouped into three zones producing a similar number of journal articles. The distribution of the journal by zone-wise is given in Table-4. It has been noticed from Table-4thatsix core journals grouped in zone-1 published 4756journal articles accounting for one-third of the total output. Similarly, the second zone contains Thirty-Seven journals that have published4715 journal articles and Seven Hundred Ninety- Four journals grouped in the third zone have published 4607 journal articles. In comparison with the records in Table-4, it is clear that the trend of research publication confirms the implication of Bradford's Law.Zone-1&2 journals have been identified as core journals in the field of Endodontics.

**Table-4: Distribution by Zone of cited journals and journal articles in the field of Endodontics**

| Zone | No. of Journals | | No. of journal articles | | Cumulative No. of journal articles |
|---|---|---|---|---|---|
| | No. | (%) | No. | (%) | |
| Zone 1 | 6 | 0.72 | 4756 | 33.78 | 4756 |
| Zone 2 | 37 | 4.42 | 4715 | 33.49 | 9471 |
| Zone 3 | 794 | 94.86 | 4607 | 32.72 | 14078 |

| | | | | | |
|---|---|---|---|---|---|
| **Total** | **837** | **100.00** | **14078** | **100.00** | |

## RANKING OF JOURNALS IN ENDODONTICS RESEARCH:

Ranking of the journals along with the country of publications based on the research output in the field of Endodontics for the year 1999-2018 is presented inTable-5. The highly productive journals up to ten ranks are as follows:

1. 'Journal of Endodontics' published in the United States with 2074 contributions amounting to 14.73% of total contributions.
2. 'International Endodontic Journal' published in England with 973 contributions amounting to 6.91%.
3. 'Journal of Conservative Dentistry: JCD' published in India with 609 contributions amounting to 4.33%.
4. 'Oral surgery, Oral Medicine, Oral Pathology, Oral Radiology, and Endodontics' published in the United Stateswith386 contributions amounting to 2.74%.
5. 'Iranian Endodontic Journal'publishedinIranwith372 contributions amounting to 2.64%.
6. 'Dental Traumatology' published in Denmark with 342 contributions amounting to 2.43%.
7. 'Dentistry Today' published in the United States with 313 contributions amounting to 2.22%.
8. 'The Journal of Contemporary Dental Practice' published in India with 312 contributions amounting to 2.22%.
9. 'Australian Endodontic Journal' published in Australia with 227 contributions amounting to 1.61%.
10. 'Journal of Clinical and Diagnostic Research: JCDR' published in India with 222 contributions amounting to 1.58%.

Out of the top ten ranks, the United States journal is dominating and contributes the journal articles to the first rank, England journal contributes the journal articles to the second position, Indian journal contributes the journal articles to the third position, once again one more United States journal contributes the journal articles to the fourth position, Iran journal contributes the journal articles to the fifth position, Denmark journal contributes the journal articles to the sixth position, again the United States journal contributes the journal articles to the seventh position, once again Indian journal contributes the journal articles to the eighth position, Australia journal contributes the journal articles to the ninth

position and one more Indian journal contributes the journal articles to the tenth position.

**Table-5: Ranking of Journals in Endodontics Research**

| S.No. | Name of the Journal | No. of Records | % | Country of Publication |
|---|---|---|---|---|
| 1. | Journal of Endodontics | 2074 | 14.73 | United States |
| 2. | International Endodontic Journal | 973 | 6.91 | England |
| 3. | Journal of Conservative Dentistry : JCD | 609 | 4.33 | India |
| 4. | Oral Surgery, Oral Medicine, Oral Pathology, Oral Radiology, and Endodontics | 386 | 2.74 | United States |
| 5. | Iranian Endodontic Journal | 372 | 2.64 | Iran |
| 6. | Dental Traumatology | 342 | 2.43 | Denmark |
| 7. | Dentistry Today | 313 | 2.22 | United States |
| 8. | The Journal of Contemporary Dental Practice | 312 | 2.22 | India |
| 9. | Australian Endodontic Journal | 227 | 1.61 | Australia |
| 10. | Journal of Clinical and Diagnostic Research : JCDR | 222 | 1.58 | India |
| 11. | HuaXi Kou Qiang Yi XueZaZhi = HuaxiKouqiangYixueZazhi = West China Journal | 176 | 1.25 | China |
| 12. | Brazilian Dental Journal | 175 | 1.24 | Brazil |
| 13. | Indian Journal of Dental Research | 174 | 1.24 | India |
| 14. | Quintessence International | 169 | 1.2 | Germany |
| 15. | General Dentistry | 167 | 1.19 | United States |
| 16. | Clinical Oral Investigations | 158 | 1.12 | Germany |
| 17. | ZhonghuaKouQiang Yi XueZaZhi = ZhonghuaKouqiangYixueZazhi = Chinese | 153 | 1.09 | China |
| 18. | Shanghai Kou Qiang Yi Xue = | 152 | 1.08 | China |

| S.No. | Name of the Journal | No. of Records | % | Country of Publication |
|---|---|---|---|---|
| | Shanghai Journal of Stomatology | | | |
| 19. | Journal of Applied Oral Science : RevistaFOB | 134 | 0.95 | Brazil |
| 20. | European Journal of Dentistry | 131 | 0.93 | Germany |
| 21. | British Dental Journal | 116 | 0.82 | England |
| 22. | The Journal of Clinical Pediatric Dentistry | 114 | 0.81 | United States |
| 23. | Brazilian Oral Research | 110 | 0.78 | Brazil |
| 24. | Journal of Clinical and Experimental Dentistry | 106 | 0.75 | Spain |
| 25. | Compendium of Continuing Education in Dentistry | 100 | 0.71 | United States |
| 26. | Journal of Dental Education | 97 | 0.69 | United States |
| 27. | Dental Materials Journal | 96 | 0.68 | Japan |
| 28. | Dental Update | 94 | 0.67 | England |
| 29. | Journal of International Oral Health : JIOH | 94 | 0.67 | India |
| 30. | The Journal of Prosthetic Dentistry | 93 | 0.66 | United States |
| 31. | Journal of the Indian Society of Pedodontics and Preventive Dentistry | 91 | 0.65 | India |
| 32. | Case Reports in Dentistry | 89 | 0.63 | Egypt |
| 33. | Journal of the American Dental Association (1939) | 89 | 0.63 | England |
| 34. | Journal of Dentistry | 87 | 0.62 | England |
| 35. | Journal of Oral Science | 86 | 0.61 | Japan |
| 36. | Contemporary Clinical Dentistry | 83 | 0.59 | India |
| 37. | Pediatric Dentistry | 83 | 0.59 | United States |
| 38. | Dental Research Journal | 79 | 0.56 | Iran |
| 39. | Journal of International Society of Preventive &Community Dentistry | 79 | 0.56 | India |
| 40. | Photomedicine and Laser Surgery | 76 | 0.54 | United States |
| 41. | Journal of Dentistry (Tehran, Iran) | 66 | 0.47 | Iran |
| 42. | American Journal of Dentistry | 63 | 0.45 | United States |

| S.No. | Name of the Journal | No. of Records | % | Country of Publication |
|---|---|---|---|---|
| 43. | ActaOdontologicaScandinavica | 61 | 0.43 | England |

## DISTRIBUTION OF JOURNALS BY COUNTRY-WISE IN ZONES:

The distribution of journals by country of publication in zones-1 and 2 is presented in the Tables-6,7 and joint of Zone-1 & Zone 2 is presented in Table-8 respectively.

## DISTRIBUTION OF JOURNALS BY COUNTRY IN THE FIRST ZONE:

The United States with the main contributions, published two journals (33.33%) out of six journals in zone-1 followed by Denmark, England, India, and Iran published one journal each in the second position.

**Table-6: Distribution of Journals by country in the First Zone**

| Country of origin | Total No. of Journals | % | Cumulative Total | Cumulative % |
|---|---|---|---|---|
| United States | 2 | 33.33 | 2 | 33.33 |
| Denmark | 1 | 16.67 | 3 | 50.00 |
| England | 1 | 16.67 | 4 | 66.67 |
| India | 1 | 16.67 | 5 | 83.33 |
| Iran | 1 | 16.67 | 6 | 100.00 |
| **Total** | **6** | **100.00** | | |

## DISTRIBUTION OF JOURNALS BY COUNTRY IN THE SECOND ZONE IN THE FIELD OF ENDODONTICS:

The distributions of journals by country of publication in zone-2 are displayed in the Tables-7. In zone-2,the United States published nine journals (24.32%) out of 37 journals followed by India published seven journals (18.92%), England published five journals(13.51%), Brazil published three journals (8.11%), China published three journals (8.11%), Germany also published three journals (8.11%), Iran published two journals (5.41%), Japan also published two journals (5.41%), Australia published one journal (2.70%),

Egypt published one journal (2.70%), and Spain also published one journal (2.70%). (Fig.7)

**Table-7: Distribution of Journals by country in the Second Zone**

| Country of origin | Total No. of Journals | % | Cumulative Total | Cumulative % |
|---|---|---|---|---|
| United States | 9 | 24.32 | 9 | 24.32 |
| India | 7 | 18.92 | 16 | 43.24 |
| England | 5 | 13.51 | 21 | 56.76 |
| Brazil | 3 | 8.11 | 24 | 64.86 |
| China | 3 | 8.11 | 27 | 72.97 |
| Germany | 3 | 8.11 | 30 | 81.08 |
| Iran | 2 | 5.41 | 32 | 86.49 |
| Japan | 2 | 5.41 | 34 | 91.89 |
| Australia | 1 | 2.70 | 35 | 94.59 |
| Egypt | 1 | 2.70 | 36 | 97.30 |
| Spain | 1 | 2.70 | 37 | 100.00 |
| **Total** | **37** | **100.00** | | |

## DISTRIBUTION OF JOURNALS BY COUNTRY IN THE JOINT OF FIRST & SECOND ZONES:

The distribution of journals by country of publication in zone-1 and zone-2 joint has been presented in the Tables-8. These journals have been identified as core journals in the field of Endodontics. It has been shown that the United States published eleven core journals (25.58%) out of Forty-Three core journals in the first position followed by India published eight core journals (18.60%) in the second position. England published six core journals (13.95%) in the third position and Brazil, China, Germany, and Iran published three core journals (6.98%) each is in the fourth position (Fig.8).

It has been revealed from the study that these countries are the primary publishers of literature in the field of Endodontics. The trend may be understood as the research in the field of Endodontics may be concentrated in these countries. Maybe the MEDLINE database has covered more journals published from these countries.

**Table-8: Distribution of Journals by country in the Joint of First & Second Zones in the field of Endodontics**

| Country of origin | Total No. of Journals | % | Cumulative Total | Cumulative % |
|---|---|---|---|---|
| United States | 11 | 25.58 | 11 | 25.58 |
| India | 8 | 18.60 | 19 | 44.19 |
| England | 6 | 13.95 | 25 | 58.14 |
| Brazil | 3 | 6.98 | 28 | 65.12 |
| China | 3 | 6.98 | 31 | 72.09 |
| Germany | 3 | 6.98 | 34 | 79.07 |
| Iran | 3 | 6.98 | 37 | 86.05 |
| Japan | 2 | 4.65 | 39 | 90.70 |
| Australia | 1 | 2.33 | 40 | 93.02 |
| Denmark | 1 | 2.33 | 41 | 95.35 |
| Egypt | 1 | 2.33 | 42 | 97.67 |
| Spain | 1 | 2.33 | 43 | 100.00 |
| **Total** | **43** | **100.00** | | |

## CONCLUSION:

In the field of Dentistry, the results display that Endodontics literature is growing year after year except for a few years. It has been shown in the study that a maximum number of records covered by journal articles in the field of Endodontics. The United States in the field of Endodontics literature covered the maximum numbers of records followed by India and England. Further, the research productivity of Endodontics confirms the implications of Bradford's Law of Scattering.

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# INDIAN JOURNAL OF MEDICAL ETHICS: (2017 – 2021) A BIBLIOMETRICS STUDY

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**Abstract:**

*Citation analysis is a practical tool to assess the concept that how a library is meeting the needs of the local users. The study analysed the citations of journals related to medical field various research work done by during the period from 2017 to 2021. Total 6735 citations were appended from 292articles. Journals contribute the highest number of citations accounting for 58.64% of total citations. Single authored contributions accounting for 59.97% of total article citations. The journal entitled 'Indian journal of Medical Ethics' published from Maharashtra occupies the first rank as the most preferred journal having been cited 222 times. The maximum number of citations 4335 (64.37%) are covered during the period of 2011-2021, followed by the1475 (21.90%) of citations in the 2001-2010. The present study is the degree of collaboration C (single author ship article) =0.54 and C (single author ship citations) = 0.40*

Keywords: *Bibliometrics, Medical Ethics, Authorship pattern*

## Introduction:

In medical ethics, the Bibliometric study is one of the worthwhile upthrust areas to do Research. Historically bibliometric methods have been used to trace relationships amongst academic journal citations and it is a set of methods used to study or measure texts and information. Many research fields use bibliometric methods to explore the impact of their field, the impact of a set of researchers or the impact of a particular paper. Alan Pritchard (1969) has coined the word `bibliometrics'. It is the application of mathematical

and statistical analysis to bibliographic units. When statistical methods were applied to analyze bibliographies, a new discipline in information science emerged known as "Bibliometrics". According to Sengupta (1985) Bibliometrics is the organization classification and quantitative evaluation of publication patterns of all macro and micro communication along with their authorships by mathematical and statistical calculus. The British standard Institution defines that the word Bibliometric is used to study of documents and patterns of publications in which mathematical and statistical methods have been applied. In this paper the authors have studied the research out in the Indian Journal of Ethics during the period from 2017 to 2021.

## About the journal:

Indian Journal of Medical Ethics was established in 1993 by the Forum for Medical Ethics Society an activist group campaigning to reform the Maharashtra Medical Council; the Society has published the journal ever since. The journal was originally entitled ***Medical Ethics***, and its first issue was published in August 1993. It obtained its current title starting in January 2004 its frequency was quarterly. It is the only journal published in India that focuses on bioethics and medical ethics, its ISSN No. 0974-8466.

## Objectives of the study

The following are the objectives:

- To examine the year wise publication of the source journal;
- To examine geographical distribution of contributions;
- To investigate the authorship pattern;
- To prepare the rank list of journals; and
- To examine the degree of collaboration

## Methodology:

The primary data has been collected from the Indian Journal of Medical Ethics [IJME] which is available at Mamata Medical College Medical Library. The secondary data were collected from
the journal articles, books and other sources available in the Central Library and the websites.
This study covers the year between 2017 and 2021 for analysis purpose.

## Tools used:

The collected data were categorize in the MS-Office Excel sheet and used the simple statistics and percentage analysis are used. The extent of collaboration in research has been calculated with the help of authorship pattern of papers. The following formula stipulated by Subramanyam (1983) is used for measuring collaboration.

**C= Nm/ Nm+Ns,** Where C= Degree of Collaboration
Nm = Number of Multi authored contributions
Ns = Number of Single authored contributions

1. No of articles Per Volume

Table 1 –Number of articles per Volume

| Volume | Year of publication | Number of articles | Percentage |
|---|---|---|---|
| Vol. - 25 | 2017 | 55 | 18.84 |
| Vol. - 26 | 2018 | 60 | 20.55 |
| Vol. - 27 | 2019 | 50 | 17.12 |
| Vol. - 28 | 2020 | 67 | 22.95 |
| Vol. - 29 | 2021 | 60 | 20.55 |
| | *Total* | 292 | 100.00 |

Table 1 indicates the year-wise distribution of articles in the Indian journal of Medical Ethics. It is observed that the highest number of 67 (22.95%) articles have been appeared in the year 2020 and Followed by 60 (20.55%) articles in the years 2018 & 2021.The less articles are publication in the year is 2019 (17.12%).

Table – 2Country wise distributions of conurbations:

| Sl. No | Categories Country | No. of articles geographical (Year wise) | | | | | | | | | | Total | % |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | 2017 | % | 2018 | % | 2019 | % | 2020 | % | 2021 | % | | |
| 1 | Indian | 37 | 67.27 | 47 | 78.33 | 34 | 52.00 | 52 | 77.61 | 42 | 70.00 | 212 | 72.60 |
| 2 | USA | 3 | 5.46 | 2 | 3.33 | 7 | 14.00 | 5 | 7.46 | 5 | 8.33 | 22 | 7.53 |
| 3 | UK | 1 | 1.82 | 2 | 3.33 | 3 | 6.00 | 1 | 1.49 | 2 | 3.33 | 9 | 3.08 |
| 4 | Iran | 3 | 5.46 | 0 | 0.00 | 2 | 4.00 | 0 | 0.00 | 1 | 1.67 | 6 | 2.06 |
| 5 | OtherForeign Countries | 11 | 20.00 | 9 | 15.00 | 4 | 8.00 | 9 | 13.44 | 10 | 16.67 | 43 | 14.73 |
| | | 55 | 100.00 | 60 | 100.00 | 50 | 100.00 | 67 | 100.00 | 60 | 100.00 | 292 | 100.00 |

Country wise distributions of conurbations

The geographical distribution is indicated by two sub categories ie Indian and Foreign countries (Table 2). In total 1 Foreign countries have contributed 80(27.40%) articles and Indian has contributed 212(72.60%).

Table – 2.1 State wise distribution of conurbations in India:

| S.No | State | Articles | % |
|---|---|---|---|
| 1. | Maharashtra | 51 | 24.06 |
| 2. | Karnataka | 36 | 16.98 |
| 3. | Tamil Nadu | 31 | 14.62 |
| 4. | New Delhi | 28 | 13.21 |
| 5. | Kerala | 15 | 7.08 |
| 6. | Chhattisgarh | 9 | 4.25 |
| 7. | Telangana | 8 | 3.77 |
| 8. | Gujarat | 7 | 3.30 |
| 9. | Uttar Pradesh | 6 | 2.83 |
| 10. | Punjab | 4 | 1.89 |
| 11. | West Bengal | 4 | 1.89 |
| 12. | Haryana | 3 | 1.42 |
| 13. | Bihar | 2 | 0.94 |
| 14. | Rajasthan | 2 | 0.94 |
| 15. | Uttarakhand | 2 | 0.94 |
| 16. | Assam | 1 | 0.47 |
| 17. | Goa | 1 | 0.47 |
| 18. | Himachal Pradesh | 1 | 0.47 |
| 19. | Odessa | 1 | 0.47 |
| | Total | 212 | 100.00 |

Form the analysis it has been observed that the highest numbers of contributors are from 51 articles and the percentage 24.06% by Maharashtra and it is followed by 16.98% Karnataka, Tamil Nadu 14.62% New Delhi 13.21%, Kerala, Chhattisgarh, Telangana, Gujarat, Uttar Pradesh so on.

The above table -3 showed that out of 292 articles contributed a single author has contributed 135 46.23% of the total articles, contributions were published two authors, 26.03% of the contributions were contributed by three authors, 11.99% four authors 5.14%, five authors 5.82%, six authors 2.05% of contributions were contributed by more than six author 2.74%. A Significant note of the study is that the majority of articles are contributed by single author.

Degree of collaboration in the Indian Journal of Medical Ethics articles.

3. Articles Authorship Pattern

| Sl. no | Authorship | 2017 | % | 2018 | % | 2019 | % | 2020 | % | 2021 | % | Total | % |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | Single | 25 | 45.45 | 25 | 41.67 | 24 | 48.00 | 32 | 47.76 | 29 | 48.33 | 135 | 46.23 |
| 2 | Two authors | 12 | 21.82 | 17 | 28.33 | 13 | 26.00 | 10 | 14.93 | 24 | 40.00 | 76 | 26.03 |
| 3 | Three Authors | 10 | 18.18 | 9 | 15.00 | 3 | 6.00 | 10 | 14.93 | 3 | 5.00 | 35 | 11.99 |
| 4 | Four Authors | 5 | 9.09 | 1 | 1.67 | 3 | 6.00 | 5 | 7.46 | 1 | 1.67 | 15 | 5.14 |
| 5 | Five Authors | 2 | 3.64 | 4 | 6.67 | 3 | 6.00 | 8 | 11.94 | 0 | 0.00 | 17 | 5.82 |
| 6 | Six Authors | 1 | 1.82 | 2 | 3.33 | 1 | 2.00 | 1 | 1.49 | 1 | 1.67 | 6 | 2.05 |
| 7 | More than six Authors | 0 | 0.00 | 2 | 3.33 | 3 | 6.00 | 1 | 1.49 | 2 | 3.33 | 8 | 2.74 |
|  | Total | 55 | 100.0 | 60 | 100.0 | 50 | 100.0 | 67 | 100.0 | 60 | 100.0 | 292 | 100.00 |

The formula given by K. Subramanyam is useful for determining the degree of collaboration in quantitative terms. The study followed the same formula which is mathematically put as:

C=NM/NM+NS
Where C= Degree of collaboration
NM = Number of Multi-Author papers
NS = Number of Single Author Paper.
In the Present Study NM = 157, NS = 135
C = 157/157+135 = 157/292
C = 0.54

Thus the degree of collaboration in Indian Journal of Medical Ethics is 0.54 which clearly indicates its dominance upon individual contribution.

Table-5 Year of Citations in the journal

Year is referred to as length of time material has existed, measured in years. This is done to determine the recency of citations cited in this journal. The oldest citations cited were a journal was published in before 1863 and this has in vol.–27 issue 2 of 2019. The next in age was a journal titled bulletin number -4, in 1910 but cited in 2017 25$^{th}$ volume. The most current citations were published in 2021 that has cited in vol.–29. Maximum 4335 (64.37%) of materials were published between 2011-2021. Followed by this, 1475 (21.90%) citation between 2001-2010, and 467 (6.93%) in 1991-2000 with citations.

The outcome also shows that majority of the works cited is recent; this could be due to increasing the accessibility of authors to recent works done on this field. This could also be linked to the born of publications in medical ethics fields in this part of the world.

## 4. No of citations Per Volume

| Year of publication | Volume | Number of Articles | Number of Citations | Citations Percentage |
|---|---|---|---|---|
| 2017 | Vol. - 25 | 55 | 1282 | 19.04 |
| 2018 | Vol. - 26 | 60 | 1381 | 20.50 |
| 2019 | Vol. - 27 | 50 | 1289 | 19.14 |
| 2020 | Vol. - 28 | 67 | 1426 | 21.17 |
| 2021 | Vol. - 29 | 60 | 1357 | 20.15 |
| | *Total* | 292 | 6735 | 100.00 |

Table-5 Year of Citations in the journal volume wise:

| Sl. No | Year of Citations per volumes | No. of citations (Year wise) | | | | | | | | | | Total | % |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | 2017 | % | 2018 | % | 2019 | % | 2020 | % | 2021 | % | | |
| 1 | Before 1980 | 78 | 6.08 | 55 | 3.98 | 67 | 5.20 | 35 | 2.46 | 13 | 0.96 | 248 | 3.68 |
| 2 | 1981 – 1990 | 48 | 3.74 | 38 | 2.75 | 27 | 2.09 | 21 | 1.47 | 22 | 1.62 | 156 | 2.32 |
| 3 | 1991 – 2000 | 106 | 8.27 | 105 | 7.60 | 88 | 6.83 | 82 | 5.75 | 86 | 6.34 | 467 | 6.93 |
| 4 | 2001 – 2010 | 332 | 25.90 | 419 | 30.34 | 299 | 23.20 | 231 | 16.20 | 194 | 14.30 | 1475 | 21.90 |
| 5 | 2011 – 2021 | 712 | 55.54 | 754 | 54.60 | 805 | 62.45 | 1037 | 72.72 | 1027 | 75.68 | 4335 | 64.37 |
| 6 | No date | 6 | 0.47 | 10 | 0.73 | 3 | 0.23 | 20 | 1.40 | 15 | 1.11 | 54 | 0.80 |
| | | 1282 | 100.00 | 1381 | 100.00 | 1289 | 100.00 | 1426 | 100.00 | 1357 | 100.00 | 6735 | 100.0 |

Table-6Distribution of forms of materials cited

| Sl. No | Materials of Citations per volumes | No. of citations (Year wise) | | | | | | | | | | Total | % |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | 2017 | % | 2018 | % | 2019 | % | 2020 | % | 2021 | % | | |
| 1 | Book | 190 | 14.82 | 149 | 10.79 | 199 | 15.44 | 263 | 18.44 | 338 | 24.91 | 1139 | 16.91 |
| 2 | Journals | 774 | 60.37 | 759 | 54.96 | 692 | 53.69 | 931 | 65.29 | 793 | 58.44 | 3949 | 58.64 |
| 3 | News Paper | 49 | 3.82 | 69 | 5.00 | 73 | 5.66 | 94 | 6.59 | 153 | 11.27 | 438 | 6.50 |
| 4 | report | 198 | 15.45 | 392 | 28.38 | 280 | 21.72 | 112 | 7.86 | 53 | 3.91 | 1035 | 15.37 |
| 5 | web | 71 | 5.54 | 12 | 0.87 | 45 | 3.49 | 26 | 1.82 | 20 | 1.47 | 174 | 2.58 |
| | | | | | | | | | | | | | |
| | Total | 1282 | 100.00 | 1381 | 100.00 | 1289 | 100.00 | 1426 | 100.00 | 1357 | 100.00 | 6735 | 100.00 |

Table-6 Distribution of forms of materials cited A total of 6735citations published by the journal in the period under review produced 3949 citations that is an average of (58.64) per article. Cited materials were grouped in to ten (5) categories: Journals, Books, News papers, Reports, Web Resources, Journal -3949; and the books-1139 were the most cited sources followed by Web based resources 174; News Paper-438; Reports 1035;

This finding concurs with the other previous studies which confirm that journals were the most cited forms of materials used by researchers. Next to the journals, books were mostly cited by authors.

The above table -7 showed that out of 6735citations contributed a single author has contributed 4039,59.97% of the total citations, contributions were published two authors, 12.13%; of the contributions were contributed by three authors 8.49%; four authors 5.58%; five authors 3.61%; six authors 2.90%; of contributions were contributed by more than six author 7.32%. A Significant note of the study is that the majority of citations are contributed by single author.

Degree of collaboration in the Indian Journal of Medical Ethics citations.

The formula given by K. Subramanyam is useful for determining the degree of collaboration in quantitative terms. The study followed the same formula which is mathematically put as:

C=NM/NM+NS
Where C= Degree of collaboration
NM = Number of Multi-Author citations
NS = Number of Single Author citations.
In the Present Study NM = 2696, NS = 4039
C = 2696/2696+4039 = 2696/6735
C = 0.40

Table-7.Citations Authorship Pattern

| Sl. no | Authorship | 2017 | % | 2018 | % | 2019 | % | 2020 | % | 2021 | % | Total | % |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | Single | 742 | 57.89 | 832 | 60.25 | 795 | 61.67 | 818 | 57.36 | 852 | 62.79 | 4039 | 59.97 |
| 2 | Two authors | 159 | 12.40 | 182 | 13.18 | 145 | 11.25 | 168 | 11.78 | 163 | 12.01 | 817 | 12.13 |
| 3 | Three Authors | 124 | 9.67 | 105 | 7.60 | 117 | 9.08 | 112 | 7.85 | 114 | 8.40 | 572 | 8.49 |
| 4 | Four Authors | 78 | 6.08 | 69 | 5.00 | 78 | 6.05 | 90 | 6.31 | 61 | 4.49 | 376 | 5.58 |
| 5 | Five Authors | 53 | 4.13 | 56 | 4.06 | 46 | 3.57 | 52 | 3.65 | 36 | 2.65 | 243 | 3.61 |
| 6 | Six Authors | 54 | 4.21 | 34 | 2.46 | 32 | 2.48 | 43 | 3.02 | 32 | 2.36 | 195 | 2.90 |
| 7 | More than six Authors | 72 | 5.62 | 103 | 7.46 | 76 | 5.90 | 143 | 10.03 | 99 | 7.30 | 493 | 7.32 |
| | Total | 1282 | 100.0 | 1381 | 100.0 | 1289 | 100.0 | 1426 | 100.0 | 1357 | 100.0 | 6735 | 100.0 |

Table- 8 Most ranked journals cited in the journal articles

| S.No. | Name of the Journal | Citations | Cumulative | % |
|---|---|---|---|---|
| 1. | Indian Journal of Medical Ethics | 222 | | 5.62 |
| 2. | B.M.J. | 157 | 379 | 3.98 |
| 3. | Lancet | 143 | 522 | 3.62 |
| 4. | New England Journal Of Medicine | 115 | 637 | 2.91 |
| 5. | Journal of Medical Ethics | 74 | 711 | 1.87 |
| 6. | JAMA | 68 | 779 | 1.72 |
| 7. | Economic and Political Weekly | 48 | 827 | 1.22 |
| 8. | Bioethics | 39 | 866 | 0.99 |
| 9. | PloS One | 38 | 904 | 0.96 |
| 10. | Nature | 35 | 939 | 0.89 |
| 11. | Indian Journal of Psychiatry | 33 | 939 | 0.84 |
| 12. | National Medical Journal of India | 33 | 1005 | 0.84 |
| 13. | Social and Science Medicine | 32 | 1037 | 0.81 |
| 14. | Indian Journal Medical Research | 31 | 1068 | 0.79 |
| 15. | BMC Medical Ethics | 30 | 1098 | 0.76 |
| 16. | Bulletin World Health Origination | 29 | 1098 | 0.73 |
| 17. | PLoS Medicine | 29 | 1098 | 0.73 |
| 18. | Vaccine | 29 | 1185 | 0.73 |
| 19. | American Journal of Public Health | 27 | 1212 | 0.68 |
| 20. | Nursing Ethics | 22 | 1234 | 0.56 |
| 21. | Indian Pediatrics | 20 | 1254 | 0.51 |
| 22. | Science | 19 | 1273 | 0.48 |
| 23. | Academic Medicine | 17 | 1273 | 0.43 |
| 24. | The American Journal of Bioethics | 17 | 1273 | 0.43 |
| 25. | BMJ Glob Health | 17 | 1273 | 0.43 |
| 26. | The Journal of Infectious Diseases | 17 | 1341 | 0.43 |
| 27. | American Journal of Obstetrics &Gynecology | 16 | 1341 | 0.41 |
| 28. | Hastings Center Report | 16 | 1373 | 0.41 |
| 29. | The British Journal of Psychiatry | 15 | 1373 | 0.38 |
| 30. | Journal of Law Medicine & Ethics | 15 | 1373 | 0.38 |
| 31. | Perspective in Clinical Research | 15 | 1418 | 0.38 |
| 32. | Annals of Internal Medicine | 14 | 1432 | 0.35 |
| 33. | BMC Public Health | 13 | 1432 | 0.33 |
| 34. | Lancet Infectious Diseases | 13 | 1432 | 0.33 |
| 35. | Obstetrics &Gynecology | 13 | 1471 | 0.33 |
| 36. | Archives of Internal Medicine | 12 | 1471 | 0.29 |
| 37. | Indian Journal of Public Health | 12 | 1471 | 0.29 |

| | | | | |
|---|---|---|---|---|
| 38. | Lancet Global Health | 12 | 1507 | 0.29 |
| 39. | BMJ Evidence Based Medicine | 11 | 1518 | 0.28 |
| 40. | BMC Health Services Research | 10 | 1518 | 0.25 |
| 41. | Clinical Infectious Diseases | 10 | 1518 | 0.25 |
| 42. | Genetics in Medicine | 10 | 1518 | 0.25 |
| 43. | Health Policy Plan | 10 | 1518 | 0.25 |
| 44. | Pediatrics | 10 | 1568 | 0.25 |
| 45. | Cochrane Database Systematic Reviews | 9 | 1568 | 0.23 |
| 46. | Human Vaccines & Immunotherapeutics | 9 | 1568 | 0.23 |
| 47. | Indian Journal of Community Medicine | 9 | 1568 | 0.23 |
| 48. | Medical Education | 9 | 1568 | 0.23 |
| 49. | Nurse Education Today | 9 | 1568 | 0.23 |
| 50. | Public Health Ethics | 9 | 1568 | 0.23 |
| 51. | Tropical Medicine and Internal Health | 9 | 1631 | 0.23 |
| 52. | AMA Journal of Ethics | 8 | 1631 | 0.20 |
| 53. | Asian Bioethics Review | 8 | 1631 | 0.20 |
| 54. | Clinical Trials | 8 | 1631 | 0.20 |
| 55. | Journal of Advanced Nurses | 8 | 1631 | 0.20 |
| 56. | Journal of General Internal Medicine | 8 | 1671 | 0.20 |
| 57. | The American Journal of Surgical Pathology | 7 | 1671 | 0.18 |
| 58. | Current Science | 7 | 1671 | 0.18 |
| 59. | Developing World Bioethics | 7 | 1671 | 0.18 |
| 60. | Journal of Royal Society Medicine | 7 | 1671 | 0.18 |
| 61. | MMWR Morbidity Mortality Weekly Report | 7 | 1671 | 0.18 |
| 62. | World Psychiatry | 7 | 1713 | 0.18 |
| 63. | American Journal Medical Genetics | 6 | 1713 | 0.15 |
| 64. | Archives of Dermatology | 6 | 1713 | 0.15 |
| 65. | Chest | 6 | 1713 | 0.15 |
| 66. | CMAJ | 6 | 1713 | 0.15 |
| 67. | India Today | 6 | 1713 | 0.15 |
| 68. | Indian Journal Palliative Care | 6 | 1713 | 0.15 |
| 69. | Indian Journal of Medical Science | 6 | 1713 | 0.15 |
| 70. | Journal of Empirical Research on Human Research Ethics | 6 | 1713 | 0.15 |
| 71. | Journalof Family Medicine Primary Care | 6 | 1713 | 0.15 |
| 72. | Medrxiv | 6 | 1713 | 0.15 |
| 73. | PLOS Neglected Tropical Diseases | 6 | 1713 | 0.15 |
| 74. | Public Health Review | 6 | 1785 | 0.15 |
| 75. | American Journal Psychiatry | 5 | 1785 | 0.13 |

| | | | | |
|---|---|---|---|---|
| 76. | American Journal of Respiratory and Critical Care Medicine | 5 | 1785 | 0.13 |
| 77. | Australian and New Zealand Journal of Obstetrics & Gynecology | 5 | 1785 | 0.13 |
| 78. | Clinical Experimental Optometry | 5 | 1785 | 0.13 |
| 79. | European Journal of Human Genetics | 5 | 1785 | 0.13 |
| 80. | Iran Journal of Nurses Midwifery Research | 5 | 1785 | 0.13 |
| 81. | Journal Pain Symptom Manage | 5 | 1785 | 0.13 |
| 82. | Journal of Postgraduate Medicine | 5 | 1785 | 0.13 |
| 83. | Kennedy Inst Ethics J | 5 | 1785 | 0.13 |
| 84. | Principles of Biomedical Ethics | 5 | 1785 | 0.13 |
| 85. | Reproductive Health Matters. | 5 | 1785 | 0.13 |
| 86. | RHiME | 5 | 1785 | 0.13 |
| 87. | Transfusion | 5 | 1785 | 0.13 |
| 88. | Travel Medicine and Infectious Diseases | 5 | 1855 | 0.13 |
| 89. | 4 citations with 35 journals | 140 | 1995 | 3.54 |
| 90. | 3 citations with 62 journals | 186 | 2181 | 4.71 |
| 91. | 2 citations with 179 journals | 358 | 2539 | 9.07 |
| 92. | 1 citation with 1410 journals | 1410 | 3949 | 35.71 |
| | Total | 3949 | | 100.00 |

Table- 8Most ranked journals cited in the Pearl journal articles

The table above depicts most cited journals of Medical Ethics fields' total citation 3949. The journal Indian Journal of Medical Ethics stands 1st rank in citating. It has cited 222 (5.62%) times, followed by B.M.J.157 (3.98%) times; Lancet143 (3.62%) times; New England Journal of Medicine115 (2.91%) times; Journal of Medical Ethics74 (1.87%) times and the journal stands 5th rank.

## Conclusion:

The expose of study is related to Bibliometrics analysis of articles produce in Indian journal of medical ethics from 2017-2021. The study has research several feature such as authorship Pattern, degree of collaboration among the authors and geographical distribution of papers. The year-wise classification of articles in Indian Journal of Medical Ethics shows that the highest number 67 (22.95%) total output 292 have materialized in the year 2020. Maximum number of articles is 135 (46.23%) have been contributed by single author. This has been further testified with the degree of collaboration. The degree of collaboration in Indian Journal of medical ethics is 0.54 which clearly contribution. The Geographical distribution of papers highlights that the journal is dominated by the host

country (i.e. India) as most of the articles are contributed by the professionals from India. The result further reveal that the contribution by Maharashtra in the highest one in India.

Journals are sensitive indicators of metalize the new ideas in any discipline. They give out the existing problems requiring solution, research pattern to solve these problems, the practices fixed to various areas etc. The journal done for good to reach some of its assurance, in spite of the few findings made above, the journal has confirm itself to be one of the good IJME not only in India but also widen to outside of that.

The dissemination of research output in the field of Medical Ethics Research is increasing year by year. The medical practitioners are also attentive to publish their research work continuously research articles, case study, reports, etc. in reputed journals. The Medical Research centers are also trying to publish their research output through the reputed journals for the benefit of the users in their field.

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# Open Access and Similarity Index of Doctoral Theses: A Study

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## Abstract

*This paper examines the impact of open access in similarity index of five (5) doctoral theses retrieved from a university in Shodhganga.To ensure anonymity of both the university and authors, ethical considerations were strictly adhered to. Normalization of the downloaded theses was ensured through running Turnitin against chapters of the theses retrieved i.e. introduction, literature review, methodology, analysis, and findings. Document Similarity Index (DSI) and Source Similarity Index (SSI) have been derived by removing false positives manually via comparing these sources with the highlighted portions in the theses. The findings revealed that, average DSI is 25.2%, which is within the range of most recommended similarity index proposed by many universities in India. However, with respect to chapter-wise distribution of DSI, average similarity index, for introduction was (33%), literature review (52%), methodology (17%), analysis (3%), and findings (8%). Furthermore, in terms of source-wise, internet sources had the highest percentage among the sources consulted by doctoral students. To eke on these figure, open access (OA) were the most 666(93.71%) used sources by doctoral students for their theses. The implication of these findings is that PhD scholars prefer to use open access for conducting research. The study recommends that universities should consider SSI in addition to DSI in detecting plagiarism among students.*

**Keywords**: *Open Access, Plagiarism, Scientific Writing, Content Similarity, Doctoral Thesis*

## Introduction

Plagiarism is one of the most attractive concepts that draw the attention of scholars (Zarif, 2013). It involves a person using a whole or partially a considerable portion of another person's work without acknowledgment (Zarif, 2013; Razera, 2011). It is in line with these submissions that, Shahabuddin (2009), categorically detailed the pattern of plagiarism, citing this act in many abstracts of articles submitted for publication, Ph.D. theses, etc., to the extent of describing it as unethical conduct. This implies the depth and width of this act have consequences on teaching, learning, and research. The triggers for plagiarizing among students are many. According to Canay-Pazos, Ballesteros, Rodríguez-Rodríguez, and Failler (2021), students plagiarize whenever there is an easiness to access the internet (95%), easiness of using/copying a text instead of generating/doing it (87.7%). Alternatively, 36.9% of students indicated that earning huge marks and attaining more remarkable achievements by cheating was a relevant or very relevant factor in indulging them in plagiarizing (Canay-Pazos, Ballesteros, Rodríguez-Rodríguez, & Failler, 2021). These acts are justifiable due to students' motivation to submit a considerably large number of works in a limited timeframe.

Despite the presence of laws to sanction a particular individual plagiarist, these laws do not have strong applicability in many contexts. As cited by Morarji (2019), there are laws like Stop Online Piracy Act (SOPA), Property Intellectual Property Act (PIPA), etc., but they have not performed their duties excellently. This is to imply how plagiarism would continue if something urgent is not done to cut its progression. In addition, Morarji (2019) observed that, based on the survey of 400 respondents, college professors are aware of plagiarism, excluding college teachers and students. Moreover, plenty of students did not consider plagiarism a crime.

Advancement in technology and open access (OA) prevents concealment of plagiarized texts in electronic information resources against the previous traditional print formats. Despite detecting plagiaristic texts in e-format has time-constraint and is expensive, especially for write-ups that are not indexed in open access category, scholarly community is challenged to come up with another possible means of detecting this practice (Ocholla & Ocholla, 2016) for safe-guarding its integrity and progression. To begin with, OA provides resources that are available, accessible, and usable by all information users and that, all restrictions are removed except internet connectivity (Ocholla & Ocholla, 2016). That is why some scholars, according to Ocholla and Ocholla, (2016) suggested that, there is strong

relationship between OA and plagiarism, and there are three reasons for this. These are

1. OA is a gateway to plagiarism (Abrizah, 2009; Brandt, Gutbrod, Wellnitz, & Wolf, 2010)
2. OA serves as a forensic tool to identify and detect plagiarism (Brandt, Gutbrod, Wellnitz, & Wolf, 2010)
3. Still others opined that OA increases and decreases plagiarism to the extent that Purdy, (2005, p276) observed that, "*if plagiarism is easier to commit because of internet, it is also easier to catch because of the internet*".

It is against this background that this paper tries to

1. Examine the relationship between Open Access sources and Plagiarism level.
2. Identify the types of sources used by doctoral research students of LIS.

## Materials and Method

The study consulted 50 recently submitted theses to a university in Shodhganga from 2016-2020. Five theses (10%) were randomly selected to serve as a sample for this investigation. The anonymity of the university and authors have been strictly adhered to for privacy purpose. The downloaded theses were normalized by selecting the mandatory chapters of a thesis viz, introduction, literature review, methodology, analysis, and findings. There is no marked chapterization pattern among these theses. This resulted in restricting to use only five chapters for this study. This implies that some chapters have not been considered for this analysis. Thus, the similarity percentage retrieved of the chapters under study are not the exact similarity percentage of the theses. In contrast, the chapter-wise similarity percentage shows the percentage of textual resemblance that exits in the theses with other sources.

Further, the study used Turnitin plagiarism detection software for checking the document similarity and source similarity by removing the false positives manually through comparing these sources with the highlighted texts in the theses. Each source has been examined in the browser for its type and categorized as open access sources and paid sources as per the license shown by the source website.

## Data Analysis and Discussion

**Table 1: Document Similarity Index of theses**

| Thesis | DSI |
|---|---|
| T1 | 22% |
| T2 | 6% |
| T3 | 31% |
| T4 | 36% |
| T5 | 31% |
| Average | **25.2%** |

The document similarity index (DSI) is the summation of its supporting source similarity index (SSI). It is one of the essential dependent variables which shows the percentage of textual similarity of a particular thesis with other sources. Table 1 illustrates the Document similarity identified after removing the false positives from each resource. Sources less than 5 words have been excluded along the sources published after the publication year of a particular thesis. The highest percentage found in this study is T4 (36%) and the least percentage is T1 (6%). On an average the theses similarity percentage thus is 25.2% which is in line with the similarity tolerance levels permitted by various Indian universities.

**Table 2: Chapter wise distribution of DSI**

| Thesis Code | Introduction | Review of Literature | Methodology | Analysis | Findings |
|---|---|---|---|---|---|
| T1 | 34% | 35% | 19% | 3% | 6% |
| T2 | 20% | 4% | 4% | 2% | 2% |
| T3 | 58% | 57% | 24% | 2% | 9% |
| T4 | 20% | 79% | 19% | 5% | 12% |
| T5 | 34% | 84% | 21% | 5% | 9% |
| **Average** | **33%** | **52%** | **17%** | **3%** | **8%** |

Table 2 shows the chapter-wise document similarity index retrieved by the software for the five theses considered for this study. It detected the textual similarity not the originality of the research. The highest percentage of document similarity is accounted for review of literature chapter (52%) followed by introduction chapter. This high number is attributable to the fact that most doctoral students fail to paraphrase and acknowledge the sources appropriately. It is also clear that most students, for literature review chapter, instead to review literature extensively, they rather copy the abstract and fail to acknowledge the source

intentionally or unintentionally. Most institutions, of late, advocate for zero tolerance of content similarity in the analysis and findings chapter. But the trend shows otherwise as in Table 2 above. This study argues that there would be some typical sentences in analysis and finding chapters that are common to all the theses and hence, there will be some level of similarity between theses. The problem of text borrowing could be avoided if researchers try to come out with newer lexical structures to report their research findings.

**Table 3: Source wise distribution of similarity percentage**

| Thesis Code | Internet | Publication | Total |
|---|---|---|---|
| T1 | 127(76.048%) | 40(23.952%) | 167 |
| T2 | 65(75.581%) | 21(24.419%) | 86 |
| T3 | 107(79.259%) | 28(20.741%) | 135 |
| T4 | 105(78.358%) | 29(21.642%) | 134 |
| T5 | 129(68.984%) | 58(31.016) | 187 |

The internet sources which are easily available for 'cut and paste' find to be the most frequently and widely used materials for researchers for the presentation of their research work. The plagiarism detection software 'Turnitin' categorises the sources available in its databases as 'Internet, Publications and students 'paper. The access of student's paper requires special permission from the respective university of the paper has been submitted, that category has been excluded from similarity matching process from the software settings in the initial stage itself. The group 'publications' comprises mainly journal articles that can be access freely as well as those requires access fee. Table 3 clearly indicates that researchers have a practice of taking paragraphs or even sentences from those sources which are available freely in the internet. Previous research shows that authors do not consider copying text from internet sources as research misconduct (Morarji. 2019).On the contrary, Ocholla and Ocholla (2016) argues sources published in the Open Access environment helps in detecting the plagiarism easily.

**Table 4:Types of sources access-wise**

| Thesis Code | Proprietary (Paid Sources) | Open Access (Free Sources) | Total |
|---|---|---|---|
| T1 | 9 (5.389%) | 158 (94.611%) | 167 |
| T2 | 2 (2.326%) | 84 (97.674%) | 86 |
| T3 | 13 (9.63%) | 122 (90.37%) | 135 |

| | | | |
|---|---|---|---|
| T4 | 9 (6.716%) | 125 (93.284%) | 134 |
| T5 | 14 (7.487%) | 173 (92.513%) | 187 |
| **Total** | **47 (6.629%)** | **662 (93.371%)** | **709** |

The Budapest Open Access Initiative (BOAI, 2002) made scholarly communications available for the lawful use of information resources with a constraint that the authors should be given proper acknowledgement for their work to be cited. Open Access initiatives after that, projects an exponential growth in its timeline as more universities, libraries, and other institutions started contributing more. The escalating presence of sources on the internet at the same time give way to plagiarism. Table 4 gives the insights to this statement as the theses run textual similarity detection yield the list of sources which belong to the Open Access platform. On an average 93% of the total sources are available in open access, which are widely used by the research community for their research work without proper acknowledgment. The implication of this finding is that it is easy to retrieve, download, and use by students. Secondly, students feel that since it is freely available, giving proper acknowledgement is not necessary.

**Table 5: Level of Similarity Source-wise**

| Thesis Code | Internet | | | | | Publication | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | >1% | 1 to 5% | 6 to 10% | 11 to 15% | Total | >1% | 1 to 5% | 6 to 10% | 11 to 15% | Total |
| T1 | 91 | 34 | 2 | 0 | 127 | 36 | 4 | 0 | 0 | 40 |
| T2 | 57 | 8 | 0 | 0 | 65 | 20 | 1 | 0 | 0 | 21 |
| T3 | 74 | 29 | 1 | 3 | 107 | 26 | 2 | 0 | 0 | 28 |
| T4 | 45 | 58 | 1 | 1 | 105 | 16 | 13 | 0 | 0 | 29 |
| T5 | 68 | 57 | 4 | 0 | 129 | 42 | 16 | 0 | 0 | 58 |
| Total | **335** | **186** | **8** | **4** | **533** | **140** | **36** | **0** | **0** | **176** |

Turnitin software detects the textual similarity as percentage in terms of source similarity index which is the breakup of Document similarity Index. It lists out all the available sources that show a similarity to a particular word, phrase, sentence, and paragraph used in the document submitted for the content originality report. Table 5 reveals the number of sources which come under various percentage categories. Most of the sources, both in internet and publication type show a similarity of less than one percent. The highest percent category that is 11% to

15% has only 4 sources in internet type sources. This is a promising result that the researchers borrow text from other sources without proper attribution is very less compared to the size of the text length is concerned. The implication of this finding is that there is an inverse relationship between the number of sources and level of similarity percentage where those that are less than 1% have highest frequency. At the same time, the similarity level of copied content is more of Open Access resources than copied from the publications.

## Conclusion

It is clear from the purview that plagiarism is gaining prominence among scholars. Every year, thousands of doctoral students write theses across universities around the globe. Many of the programs taught in universities expose students to plagiarized activities and penalties ascribed for such acts. However, students indulge in such activities either intentionally or unintentionally. The theses under study have gone far to include plagiarism in their texts in each of the chapters that constitute thesis writing. The findings indicated that there is relationship between open access and plagiarism. This clearly implies that, the pattern of plagiarizing works extended from what other previous scholars indicated to restrict merely within abstracts escalate to individual chapters. In addition, the sources used by doctoral students to write their theses are mainly open access. This means that stakeholders have to take this act seriously and develop other mechanisms of handling it squarely.

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# Mapping of India's Performance on Open Access Publications in Library Science Research (LIS): A Scientometric Study

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## Abstract

*This article highlights library and information science professionals open access research productivity and scholarly communication in India during 1991–2021 by using Web of Science databases from library and information science core journals. The purpose of this paper is to examine the research trend in open access LIS research. This paper aims to analyze India's output on open access LIS research as index in Web of Science database during the period 1991 to 2021, in respect of year-wise publications and citations, major productive countries in addition to international collaborations, most productive authors and their citation impact, preferred journals, top institutions, author's keywords, mode of scholarly communications etc. A total 1446 papers contributed by 11446 authors from 115 different countries and received 44218 citations. USA registered the most productive country with 20.6 % publications share. The researcher from All Indian Institute of Medical Science published maximum number (56) of articles and the author Kumar A have made published (44) highest publications. This study indicates the growth of open access LIS research irrespective of citation count, collaboration rate etc.*

**Keywords:** *LIS; Bibliometrics; Highly Cited Works; Indian Contribution; Citation Analysis*

## Introduction

## Library and Information Science

The study of library science and the concepts and practices of library operation and administration. Since antiquity, libraries have existed, but library science emerged as a distinct area of study only in the second half of the nineteenth century. It was increasingly subsumed within the broader discipline of information science with the knowledge explosion of the twentieth century.

## Scientometrics

The emergence of metric sciences such as librametrics, bibliometrics, scientometrics, cybermetrics or webometrics, and finally informatics can be attributed to the twentieth century1. The goal is to examine the knowledge domain using quantitative methodologies and approaches. Because of the necessity to quantify and analyze the massive investments in science and technology (S&T) sectors, particularly in research and development activities2, scientometrics is becoming increasingly popular. Journals are the major means of disseminating research and intellectual material, and publishing papers in high-impact, high-quality national and international journals is closely linked to obtaining respect, reputation, and academic performance in the higher education setting.

## Open Access

Open Access (OA) refers to the open online availability of articles, but it can also refer to data. Open Access refers to the practice of making papers freely available online open access. Because Open Access is ideal for study, it is inevitable. Deny the reality that all of the Publication's less stringent infrastructure requirements have been completed; Open Access has been a long time coming. Currently, only approximately 15% of yearly research paper output is rendered OA on its own.

## Objectives

The primary objectives of this study are to identify open access India's research performance on Library Information Science (LIS) research with regards to publication pattern, citation pattern, growth rate, top authors, top journal, etc. In order to achieve the primary objectives, the specific objectives are listed below…

- To examine India's research performance on open access Library and Information Science Research,
- To determine year-wise output and citation on Open Access in Library and Information Science Research,
- To identify top global researchers in this research field,
- Major Collaborative Country's Share in Library and Information Science
- To explore the trends in the authorship of published research in open access LIS Research
- To identify core journals in Library and Information Science discipline in which
  Indian researchers published in open access.

## Methodology

To obtain the set of specific objectives, the data for this work has been collected from the Web of Science database for the publications on Library and Information Science research during the time span 1991 to 2021. The main search string that has been used to retrieve data on LIS research was as below:
TS= ("LIS" or "Library Information Science" or "Library" or "Library Science")
and then refined by Open Access in India

The study has been covered only open access publications of India for the study period (1991-2021). Impact factor of journals obtained from Journal Citation Report (2021) for measuring scholarly impact of publishing journals. Data analysis has been carried out using Hist Cite. For keyword, co-authorship map, and co-citation network mapping, VOS viewer visualization software was applied.

## Data analysis and Discussion

This research work has been carried out in a manneri) analysis of India's research output on Open Access in Library and Information Science.

## Top Authors (11461)

A total number of 11461unique authors contributed 1446 publications to India's LIS research, in which and only 1 author contributed 40 papers. The top 20most productive authors (Table 1) contributed 11-40 publications, cumulated 1446 papers and 44218 citations. The author Kumar A registered highest rank with 44 publications and 973 citations, followed by Singh S with 31 publications and 840 citations, Kumar S with 28 publications and 329 citations and so forth.

**Tabel 1 : Top Authors**

| S. No | Author | Recs | Percent | TGCS | S.No | Author | Recs | Percent | TGCS |
|---|---|---|---|---|---|---|---|---|---|
| 1 | Kumar A | 44 | 3.0 | 973 | 11 | Sharma P | 14 | 1.0 | 68 |
| 2 | Singh S | 31 | 2.1 | 840 | 12 | Singh M | 14 | 1.0 | 218 |
| 3 | Kumar S | 28 | 1.9 | 329 | 13 | Singh R | 14 | 1.0 | 357 |
| 4 | Sharma S | 25 | 1.7 | 378 | 14 | Kumar D | 13 | 0.9 | 109 |
| 5 | Kumar R | 24 | 1.7 | 339 | 15 | Zhang Y | 13 | 0.9 | 268 |
| 6 | Sharma A | 17 | 1.2 | 308 | 16 | Kumar M | 12 | 0.8 | 278 |
| 7 | Singh A | 17 | 1.2 | 164 | 17 | Das S | 11 | 0.8 | 271 |
| 8 | Ghosh S | 16 | 1.1 | 86 | 18 | Nair S | 11 | 0.8 | 712 |
| 9 | Gupta A | 16 | 1.1 | 146 | 19 | Singh SK | 11 | 0.8 | 130 |
| 10 | Gupta S | 15 | 1.0 | 148 | 20 | Varshney RK | 11 | 0.8 | 752 |

## Journal Wise Publications (650)

The Open Access research output on LIS was published in 650 international and national journals. The top 23 journals with the highest number of research output published on LIS are projected in Table 5. The top 23 most preferred journals published 9 to 68 papers, In this study period, many authors preferred journal was PLOS ONE (68 publications and IF=3.24) for publishing their research report. Other journals include Cochrane Database of Systematic Reviews with 52 publications (IF=9.289), Scientific Reports with 48 publications (IF= 4.379), Journal of Biomolecular Structure & Dynamics with 24 outputs (IF2=3.392) and others. (Table 2)

**Tabel 2: Journal Wise Publications**

| S. No | Journal | Recs | Percent | TGCS |
|---|---|---|---|---|
| 1 | PLOS ONE | 68 | 4.7 | 1663 |
| 2 | COCHRANE DATABASE OF SYSTEMATIC REVIEWS | 52 | 3.6 | 1961 |

| | | | | |
|---|---|---|---|---|
| 3 | SCIENTIFIC REPORTS | 48 | 3.3 | 642 |
| 4 | JOURNAL OF BIOMOLECULAR STRUCTURE & DYNAMICS | 24 | 1.7 | 328 |
| 5 | ACS OMEGA | 22 | 1.5 | 230 |
| 6 | 3 BIOTECH | 19 | 1.3 | 91 |
| 7 | COMPUTER PHYSICS COMMUNICATIONS | 16 | 1.1 | 399 |
| 8 | JOURNAL OF BIOLOGICAL CHEMISTRY | 16 | 1.1 | 611 |
| 9 | RSC ADVANCES | 16 | 1.1 | 100 |
| 10 | BMC GENOMICS | 13 | 0.9 | 373 |
| 11 | MOLECULAR DIVERSITY | 11 | 0.8 | 70 |
| 12 | INDIAN JOURNAL OF MICROBIOLOGY | 10 | 0.7 | 82 |
| 13 | JOURNAL OF CHEMICAL SCIENCES | 10 | 0.7 | 90 |
| 14 | ANTIMICROBIAL AGENTS AND CHEMOTHERAPY | 9 | 0.6 | 103 |
| 15 | BMC BIOINFORMATICS | 9 | 0.6 | 152 |
| 16 | BMC PLANT BIOLOGY | 9 | 0.6 | 479 |
| 17 | BMJ OPEN | 9 | 0.6 | 64 |
| 18 | FRONTIERS IN PLANT SCIENCE | 9 | 0.6 | 178 |
| 19 | IEEE ACCESS | 9 | 0.6 | 31 |
| 20 | INDIAN JOURNAL OF OPHTHALMOLOGY | 9 | 0.6 | 192 |
| 21 | MEDCHEMCOMM | 9 | 0.6 | 125 |
| 22 | MONTHLY NOTICES OF THE ROYAL ASTRONOMICAL SOCIETY | 9 | 0.6 | 86 |
| 23 | SYSTEMATIC REVIEWS | 9 | 0.6 | 5 |

## Year Wise Distribution of Publications

India's Open Access research output on LIS research was recorded and retrieved as a cumulative total of 1446 during study period 1991 to 2021. From table-3, total publication on LIS research varies from 20 in the year 2008 to 84 in the year 2014. Total 116571 citations received by the researchers during the period under study and citation expanded from 5 in the year 1996 to 15052 in the year 2003.(Table 3)

**Table 3: Year Wise Distribution Publications**

| S. No | Year | Recs | Percent | TGCS | S. No | Year | Recs | Percent | TGCS |
|---|---|---|---|---|---|---|---|---|---|
| 1 | 1991 | 4 | 0.3 | 131 | 17 | 2007 | 14 | 1.0 | 539 |
| 2 | 1992 | 1 | 0.1 | 63 | 18 | 2008 | 20 | 1.4 | 1013 |
| 3 | 1993 | 3 | 0.2 | 34 | 19 | 2009 | 31 | 2.1 | 835 |
| 4 | 1994 | 2 | 0.1 | 28 | 20 | 2010 | 32 | 2.2 | 863 |
| 5 | 1995 | 1 | 0.1 | 5 | 21 | 2011 | 37 | 2.6 | 1876 |
| 6 | 1996 | 5 | 0.3 | 165 | 22 | 2012 | 53 | 3.7 | 1627 |
| 7 | 1997 | 7 | 0.5 | 230 | 23 | 2013 | 63 | 4.4 | 2422 |
| 8 | 1998 | 5 | 0.3 | 54 | 24 | 2014 | 84 | 5.8 | 2773 |
| 9 | 1999 | 8 | 0.6 | 148 | 25 | 2015 | 70 | 4.8 | 1795 |
| 10 | 2000 | 6 | 0.4 | 348 | 26 | 2016 | 101 | 7.0 | 2143 |
| 11 | 2001 | 8 | 0.6 | 393 | 27 | 2017 | 107 | 7.4 | 3267 |
| 12 | 2002 | 9 | 0.6 | 260 | 28 | 2018 | 118 | 8.2 | 1813 |
| 13 | 2003 | 12 | 0.8 | 15052 | 29 | 2019 | 133 | 9.2 | 1464 |
| 14 | 2004 | 17 | 1.2 | 1059 | 30 | 2020 | 183 | 12.7 | 2150 |
| 15 | 2005 | 13 | 0.9 | 484 | 31 | 2021 | 222 | 15.4 | 720 |
| 16 | 2006 | 14 | 1.0 | 374 | | | | | |

## Document Wise Publications

Table depicts the document wise distribution of papers on LIS research during the time span (1991-2021) and it is found that most of the papers were article (1101; 76.1%), followed by review (273; 18.9%), Early Access (26;1.8%), Proceedings paper (19; 1.3%) and others. (Table 4)

**Table 4: Document Wise Publications**

| S.No | Document Type | Recs | Percent | TGCS |
|---|---|---|---|---|
| 1 | Article | 1101 | 76.1 | 20021 |
| 2 | Review | 273 | 18.9 | 23647 |
| 3 | Article; Early Access | 26 | 1.8 | 45 |
| 4 | Proceedings Paper | 19 | 1.3 | 417 |
| 5 | Review; Early Access | 10 | 0.7 | 7 |
| 6 | Letter | 6 | 0.4 | 65 |
| 7 | Correction | 5 | 0.3 | 4 |
| 8 | Editorial Material | 2 | 0.1 | 6 |
| 9 | Meeting Abstract | 2 | 0.1 | 0 |
| 10 | Note | 1 | 0.1 | 6 |
| 11 | Retraction | 1 | 0.1 | 0 |

## Institution Wise Publications (3238)

A total frequency of 3238institutions participated in LIS research during 1991 to 2021 study period and it was found that only two institutions published more than a fifty publications on LIS. Table highlighted top 30 most productive institutions and there research impact. Out of 3238 institutions, 70institutions were published 10 - 50 publications each. Top publishing institutions have made 20-56 publications and their cumulated contributions were 433 (30% of global share) and cumulated 26,411 citations received during the thirty year study period. All Indian Institute of Medical Science was the topmost publishing (56 publications; 3.9%), followed by Indian Institute of Technology with 50 (3.5%) publications, University of Delhi with 48 (3.3%) publications, Jawaharlal Nehru University with 46 (3.2%) publications, Indian Institute of Science with 45 (3.1%) publications and others. (Tabel 5)

## Table 5: Institution Wise Publications

| S. No | Institution | Recs | Percent | TGCS |
|---|---|---|---|---|
| 1 | All India Institute Medical Science | 56 | 3.9 | 1747 |
| 2 | Indian Institute Technology | 50 | 3.5 | 1129 |
| 3 | University of Delhi | 48 | 3.3 | 1885 |
| 4 | Jawaharlal Nehru University | 46 | 3.2 | 1067 |
| 5 | Indian Institute Science | 45 | 3.1 | 1040 |
| 6 | CSIR | 37 | 2.6 | 697 |
| 7 | Institute Crops Res Inst Semi-Arid Trop | 23 | 1.6 | 1073 |
| 8 | King Saud University | 23 | 1.6 | 613 |
| 9 | Institute Centre Genetic Engn& Biotechnology | 22 | 1.5 | 684 |
| 10 | Punjab University | 21 | 1.5 | 387 |
| 11 | Tata Institute Fundamental Res | 21 | 1.5 | 455 |
| 12 | University of Manchester | 21 | 1.5 | 14871 |
| 13 | Christian Med College & Hospital | 20 | 1.4 | 763 |
| 14 | Manipal Academy Higher Education | 19 | 1.3 | 285 |
| 15 | University of Tokyo | 17 | 1.2 | 506 |
| 16 | University of Toronto | 17 | 1.2 | 857 |
| 17 | Charles University Prague | 16 | 1.1 | 494 |
| 18 | Chinese Academy Science | 16 | 1.1 | 509 |
| 19 | Postgrad Institute Medical Education & Res | 16 | 1.1 | 588 |
| 20 | University Michigan | 16 | 1.1 | 431 |
| 21 | Bhabha Atomic Research Centre | 15 | 1.0 | 591 |
| 22 | SRM University | 15 | 1.0 | 275 |
| 23 | University of Melbourne | 15 | 1.0 | 1437 |
| 24 | Indian Institute of Technology Madras | 14 | 1.0 | 168 |
| 25 | London School Hygiene & Tropical Medicine | 14 | 1.0 | 560 |
| 26 | University Edinburgh | 14 | 1.0 | 177 |
| 27 | University of Illinois | 14 | 1.0 | 644 |
| 28 | Banaras Hindu University | 13 | 0.9 | 232 |
| 29 | Bose Institute | 13 | 0.9 | 289 |
| 30 | Jamia Hamdard | 13 | 0.9 | 141 |

## Most Productive Countries (115)

This study identified 1446 publications during study period 1991-2021, which contributed by 115 countries. Table reveals the top twenty most productive countries in India's open access LIS research. During the period under study, USA ranked first among top 20 most productive countries with 298 publications and 20.6%international collaboration share, this is followed by United Kingdom with 181 publications (12.5% global publications share), Germany with 85 publications (5.9% global publications share), Australia with 79 publications (5.5% global publications share) and then China with 75 publications (5.2% global share).(Table 6)

**Table 6: Most Productive Countries**

| S. No | Country | Recs | Percent | TGCS | | S. No | Country | Recs | Percent | TGCS |
|---|---|---|---|---|---|---|---|---|---|---|
| 1 | USA | 298 | 20.6 | 24310 | | 11 | Japan | 53 | 3.7 | 16363 |
| 2 | UK | 181 | 12.5 | 21109 | | 12 | Spain | 52 | 3.6 | 1002 |
| 3 | Germany | 85 | 5.9 | 18123 | | 13 | Netherlands | 49 | 3.4 | 17426 |
| 4 | Australia | 79 | 5.5 | 3701 | | 14 | Brazil | 39 | 2.7 | 1630 |
| 5 | Peoples R China | 75 | 5.2 | 2000 | | 15 | South Korea | 39 | 2.7 | 2121 |
| 6 | France | 70 | 4.8 | 17001 | | 16 | Russia | 30 | 2.1 | 1141 |
| 7 | Italy | 65 | 4.5 | 3048 | | 17 | Mexico | 27 | 1.9 | 1284 |
| 8 | Switzerland | 64 | 4.4 | 17891 | | 18 | Poland | 27 | 1.9 | 242 |
| 9 | Saudi Arabia | 60 | 4.1 | 924 | | 19 | Belgium | 25 | 1.7 | 758 |
| 10 | Canada | 58 | 4.0 | 16762 | | 20 | Sweden | 24 | 1.7 | 569 |

## Keywords

Figure-1 reveal most preferred keyword that used by researchers in their research papers. Among the keywords, Library, Identification occurred in records. Here the authors have shown visualization of research hotspots with frequently occurring

keywords during the period under study using VOS viewer software its shows that 7 clusters with 97 links and its total link strength is 155.

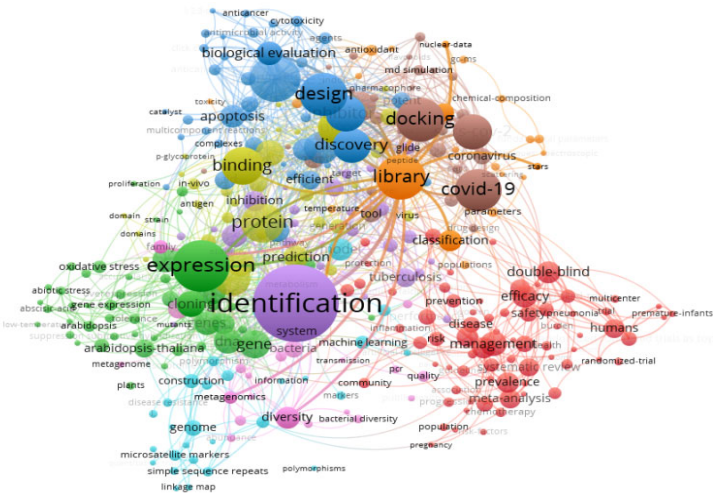



**Figure 1: Keywords**

## Co-Authorship Network

LIS research is highly interdisciplinary research in nature. Where cooperation between researchers makes advantage for conducting research and archiving research goals. Co-authorship analysis provide a window for measuring collaboration pattern between researchers within the research community. Collaboration may occur at department level, national level, institutional or organizational level. Therefore, analyzing co-authorship network of researchers can provide valuable information for organization to develop cooperation groups.

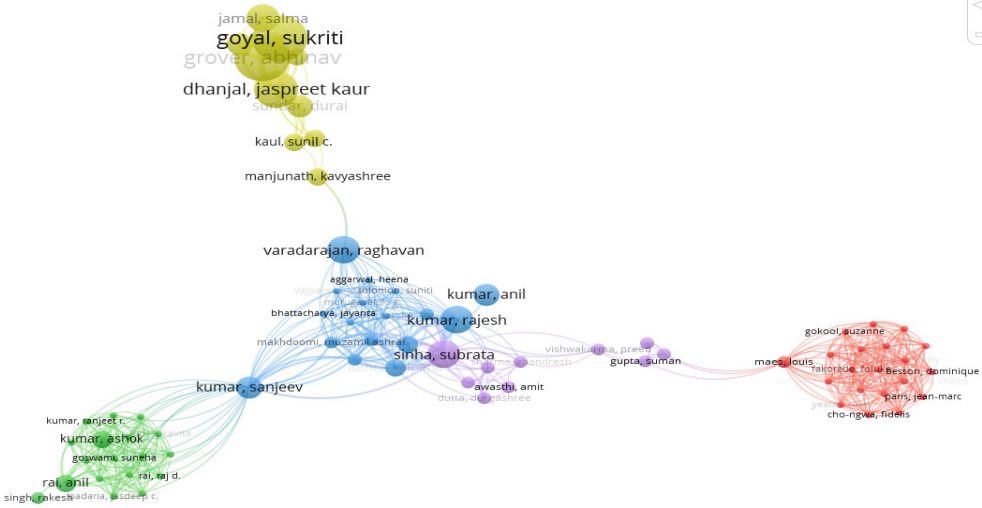



**Figure 2: Co-Authorship Network among Authors**

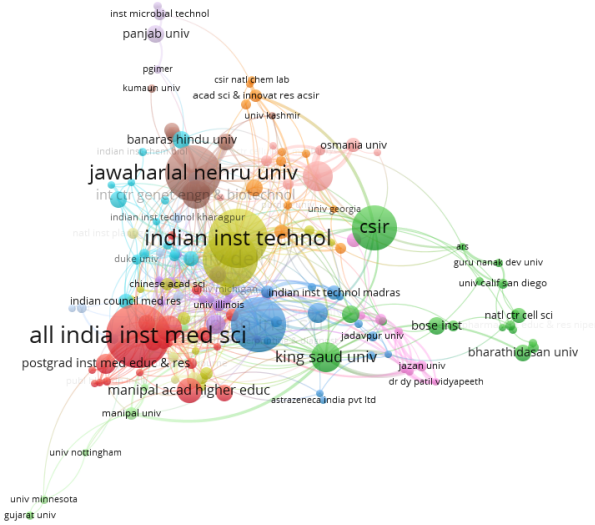



**Figure 3: Co – Authorship among Major Institutions**

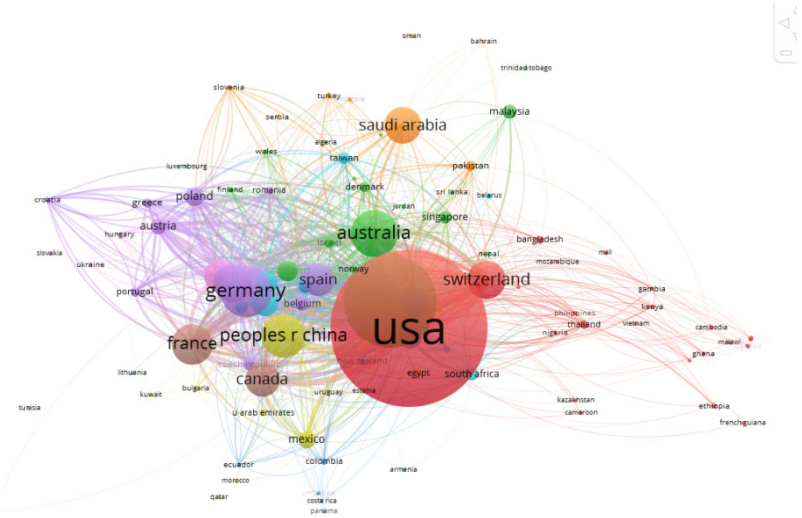



**Figure 4: Co – Authorship for Major Countries**

## Co-Citation Network

Co-citation study is an attempt to navigate primary focus area of academic research in a citation network by clustering co-cited documents. The structure of co-citation cluster has been constructed from the list of references given by the authors in their research publications (Zou et al., 2018). Figure revels top co-citation network during the period under study.

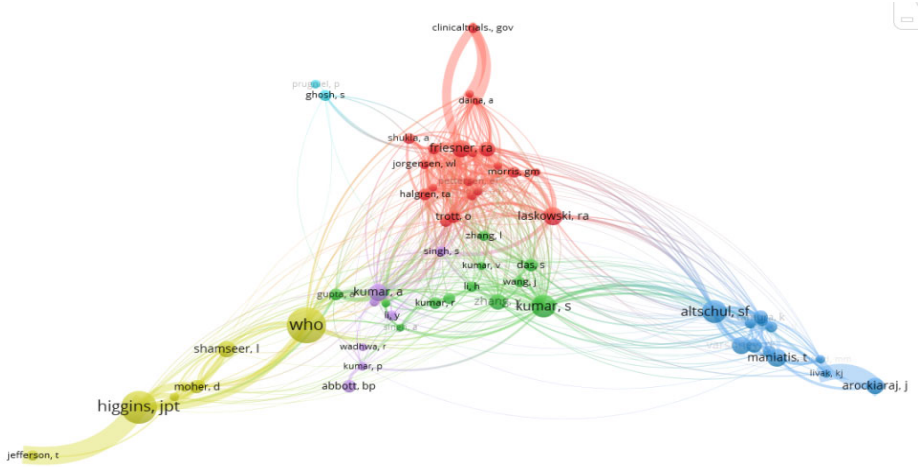



**Figure 5: Co-Citation Network**

## Conclusion

LIS have emerged as an essential subject for mapping and it can be used by researchers having different disciplines for various aspects. LIS represents the integration approach of different subject domains. The function of LIS includes data storing, displaying, data analysis, management and retrieval. The present study demonstrate increasing trend towards open access LIS research among researchers. The average publication was 7.0% and highest publication has been registered in the year 2021 with 222 publications. The highest paper published from USA, then UK, Germany, Australia and others during the marked study period. The maximum citations varies from 5 in the year 1995 to15,052 in the year 2003 and highest citations received by 'Book Chapter Review' Most productive author was Kumar A with 44 publications and Singh S has contributed with 31 publications.

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# SCIENTOMETRIC ANALYSIS OF RESEARCH OUTPUT IN PUNJAB AGRICULTURAL UNIVERSITY

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## Abstract

*The study aims to do the Scientometric analysis of global research output of Punjab Agricultural University during the last of twenty years. These twenty years produced 5990 documents of research output on Punjab Agricultural University which have been cited 10.61 percent citation per item. Most of the articles were published during the years 2015 to 2020. The data for present study was retrieved form Scopus by making search on 'Punjab Agricultural University' which yielded 5990 documents. These records represented the period between years 2001 to 2020.*

**Keywords:** *Research Output on Punjab Agricultural University, Scientometrics, Scopus*.

## Introduction

Scientometrics is the field of study which concerns itself with measuring and analysing scholarly literature. Scientometrics is a sub-field of bibliometrics. Major research issues include the measurement of the impact of research papers and academic journals, the understanding of scientific citations, and the use of such measurements in policy and management contexts.[1] In practice there is a significant overlap between scientometrics and other scientific fields such as information systems, information science, science of science policy, sociology of science, and metascience. Critics have argued that over-reliance on scientometrics has created a system of perverse incentives, producing a publish or perish environment that leads to low quality research.

## About Punjab Agricultural University

The College of Agriculture is the oldest and the largest of the four constituent colleges of Punjab Agricultural University. The college was originally

established in 1906 as Punjab Agricultural College and Research Institute, Lyallpur (now Faisalabad, Pakistan). The College was established at its present site in July, 1957. The college imparts quality education, generates unmatched research output and reaches out to the peasantry through a large network of 10 departments/schools (Departments of Agronomy, Climate Change & Agricultural Meteorology, Entomology, Extension Education, Food Science & Technology, Plant Breeding & Genetics, Plant Pathology, Soil Science, School of Agricultural Biotechnology). The college strives to achieve its mission through its team of 326 highly competent and well-qualified faculty members and state-of-the-art infrastructure and well-equipped experiential learning units of the college help produce job providing, rather than job seeking graduates. The college has thus far contributed around 5500 well-trained graduates to the human resource pool of agriculture and allied sectors. Many alumni of the college have risen to exalted positions and gained recognition both at national and international levels. The college received the Federation of Indian Chambers of Commerce and Industry Award in 1977 in recognition of its outstanding contribution to the field of agriculture.

## Objectives

In this study the investigator presents the Scientometric analysis of the research output of Punjab Agricultural University in a global context. Hence, the study aims to collect the global research data output of Punjab Agricultural University. The following are the important objectives of the study:

- ✓ To find out the Year Wise Distribution of Research Output in Punjab Agricultural University.
- ✓ To identify the Distribution of Literature Output in Punjab Agricultural University.
- ✓ To find out the Top Twenty Source wise Research Output in Punjab Agricultural University.
- ✓ To identify the Distribution of Language wise Publication in Punjab Agricultural University.
- ✓ To find out the Top Twenty Punjab Agricultural University Funding Agencies.
- ✓ To find out the Year Wise Distribution of Literature Output in Punjab Agricultural University.
- ✓ To determine the Activity Index and Priority Index of Punjab Agricultural University Articles Output.

**Table – 1: Year Wise Distribution of Research Output in Punjab Agricultural University**

| S.No | Years | Record | Percentage | Citations | Citation Per Article |
|---|---|---|---|---|---|
| 1. | 2001 | 147 | 2.45 | 2265 | 15 |
| 2. | 2002 | 155 | 2.59 | 2167 | 14 |
| 3. | 2003 | 204 | 3.41 | 3009 | 15 |
| 4. | 2004 | 206 | 3.44 | 2091 | 10 |
| 5. | 2005 | 242 | 4.04 | 3139 | 13 |
| 6. | 2006 | 244 | 4.07 | 2415 | 10 |
| 7. | 2007 | 237 | 3.96 | 3797 | 16 |
| 8. | 2008 | 226 | 3.77 | 2938 | 13 |
| 9. | 2009 | 223 | 3.72 | 3189 | 14 |
| 10. | 2010 | 228 | 3.81 | 3544 | 16 |
| 11. | 2011 | 237 | 3.95 | 3553 | 15 |
| 12. | 2012 | 261 | 4.35 | 4206 | 16 |
| 13. | 2013 | 290 | 4.84 | 3728 | 13 |
| 14. | 2014 | 355 | 5.93 | 5257 | 15 |
| 15. | 2015 | 424 | 7.08 | 4700 | 11 |
| 16. | 2016 | 443 | 7.40 | 3448 | 8 |
| 17. | 2017 | 427 | 7.13 | 3228 | 8 |
| 18. | 2018 | 426 | 7.11 | 3745 | 9 |
| 19. | 2019 | 439 | 7.33 | 1741 | 4 |
| 20. | 2020 | 576 | 9.62 | 1401 | 2 |
| **Total** | | **5990** | **100.00** | **63561** | **10.61** |

It is found from the table1 that the total number of total global citation score (TGCS) for the year 2001 to 2020 was 63561. It is again found that highest number of average TGCS was found for the years 2007, 2010 and 2012 with 16, followed by the years 2001, 2003, 2011 and 2014 with 15 each in an average. Low average score witnessed in the year 2020 with 2 citations.

**Table – 2: Top Twenty Source wise Research Output in Punjab Agricultural University**

| S.No | Source wise | Records | Citation |
|---|---|---|---|
| 1. | Indian Journal of Animal Research | 233 | 566 |
| 2. | Indian Journal of Agricultural Sciences | 227 | 810 |
| 3. | Journal of Food Science and Technology | 206 | 2282 |
| 4. | Indian Journal of Ecology | 159 | 221 |
| 5. | Indian Journal of Horticulture | 121 | 2511 |
| 6. | Indian Journal of Agronomy | 100 | 1126 |
| 7. | Journal of Agrometeorology | 99 | 562 |
| 8. | Communications in Soil Science and Plant Analysis | 89 | 677 |
| 9. | Acta Horticulture | 84 | 164 |
| 10. | Ecology, Environment and Conservation | 77 | 60 |
| 11. | Indian Journal of Agricultural Biochemistry | 63 | 96 |
| 12. | Journal of Environmental Biology | 60 | 813 |
| 13. | Field Crops Research | 57 | 2512 |
| 14. | Sugar Tech | 54 | 956 |
| 15. | Indian Journal of Genetics and Plant Breeding | 53 | 212 |
| 16. | Current Science | 52 | 455 |
| 17. | Annals of Biology | 51 | 125 |
| 18. | AMA, Agricultural Mechanization in Asia, Africa and Latin America | 46 | 89 |
| 19. | Journal of Plant Nutrition | 46 | 614 |
| 20. | Bulletin of Environmental Contamination and Toxicology | 45 | 474 |

The table 2 provides details about top twenty source titles in which Research Output in Punjab Agricultural University articles were published for the period of twenty years. These journals will be more useful to the academic and research community to choose the journal to publish their papers and also will be more useful to the library to select the titles for the libraries which have the faculty. It is found from the above table that Indian Journal of Animal Research was the top most journals in which 233 articles were published has Total Global Citation Score of 566. Indian Journal of Agricultural Sciences, Journal of Food Science and Technology, Indian Journal of Ecology, Indian Journal of Horticulture and Indian

Journal of Agronomy comes under top six journals have also received good citation scores.

**Table – 3: Top Twenty Punjab Agricultural University Funding Agencies**

| S.No | Funding Agencies | Count | Citation |
|---|---|---|---|
| 1. | Indian Council of Agricultural Research | 83 | 2140 |
| 2. | University Grants Commission | 37 | 1210 |
| 3. | Council of Scientific and Industrial Research, India | 25 | 321 |
| 4. | Punjab Agricultural University | 23 | 510 |
| 5. | Department of Biotechnology, Ministry of Science and Technology | 23 | 1021 |
| 6. | Australian Centre for International Agricultural Research | 22 | 365 |
| 7. | Bangladesh Council of Scientific and Industrial Research | 17 | 210 |
| 8. | University of the Punjab | 11 | 141 |
| 9. | Department of Science and Technology, Ministry of Science and Technology, India | 10 | 10 |
| 10. | U.S. Department of Agriculture | 8 | 951 |
| 11. | Japan Society for the Promotion of Science | 8 | 78 |
| 12. | Funding Details | 6 | 65 |
| 13. | U.S. Department of Energy | 5 | 121 |
| 14. | SchweizerischerNationalfondszur | 5 | 29 |
| 15. | International Atomic Energy Agency | 5 | 14 |
| 16. | Grains Research and Development Corporation | 5 | 201 |
| 17. | Australian Research Council | 5 | 102 |
| 18. | Royal Society of Edinburgh | 4 | 78 |
| 19. | Natural Sciences and Engineering Research Council of Canada | 4 | 56 |
| 20. | National Natural Science Foundation of China | 4 | 24 |

The table3 reveals that the allocation of funds in the field of Research Output in Punjab Agricultural University, the Indian Council of Agricultural Research has been first place. Indian Council of Agricultural Research has allotted

funds for 83 research publications with the TGCS was 2140, followed by University Grants Commission has allotted funds for 37 research publications with the TGCS was 1210, Council of Scientific and Industrial Research, India has allotted funds for 25 research publications with the TGCS was 321. Punjab Agricultural University and Department of Biotechnology, Ministry of Science and Technology have allotted funds for each 23 research publications with the TGCS was 510 and 1021.

**Table – 4: Distribution of Literature Output in Punjab Agricultural University**

| S. No | Document Type | Records | Percentage |
|---|---|---|---|
| 1. | Articles | 4959 | 82.79 |
| 2. | Conference Paper | 412 | 6.88 |
| 3. | Book Chapters | 333 | 5.56 |
| 4. | Review | 215 | 3.59 |
| 5. | Editorial Material | 38 | 0.63 |
| 6. | Letter | 12 | 0.20 |
| 7. | Short Survey | 11 | 0.18 |
| 8. | Note | 10 | 0.17 |
| | **Total** | **5990** | **100.00** |

The table4 revels that number of items published has been the items, Articles 4959 (82.79 percent) are well ahead of all other types of articles followed by Conference Paper412 (6.88percent), Book Chapters 333 (5.56 percent) and Review 215 (3.59 percent). These categories constitute more than 82 percent of the articles.

**Table – 5: Distribution of Language wise Publication in Punjab Agricultural University**

| S. No | Language | Records | Percentage |
|---|---|---|---|
| 1. | English | 5990 | 100.00 |

The table5 indicated distribution of language wise publications research output in Punjab Agricultural University for the period of 20 years i.e. from 2001 to 2020. In the language wise distribution of records, it is found that English was the predominant language published hundred percent of the records.

**Table – 6: Year Wise Distribution of Literature Output in Punjab Agricultural University**

| S. No | Document Type | 2001 | 2002 | 2003 | 2004 | 2005 | 2006 | 2007 | 2008 | 2009 | 2010 | 2011 | 2012 | 2013 | 2014 | 2015 | 2016 | 2017 | 2018 | 2019 | 2020 | Records |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1. | Articles | 127 | 134 | 179 | 174 | 210 | 211 | 196 | 187 | 176 | 179 | 182 | 204 | 230 | 292 | 357 | 372 | 353 | 348 | 357 | 491 | 4959 |
| 2. | Conference Paper | 9 | 11 | 14 | 15 | 14 | 14 | 17 | 15 | 21 | 22 | 22 | 23 | 23 | 24 | 26 | 26 | 27 | 28 | 30 | 31 | 412 |
| 3. | Book Chapters | 5 | 5 | 6 | 8 | 10 | 12 | 14 | 13 | 14 | 15 | 18 | 19 | 20 | 21 | 22 | 25 | 25 | 26 | 27 | 28 | 333 |
| 4. | Review | 2 | 3 | 3 | 4 | 5 | 6 | 8 | 9 | 9 | 10 | 11 | 11 | 13 | 15 | 15 | 16 | 18 | 19 | 19 | 19 | 215 |
| 5. | Editorial Material | 1 | 1 | 1 | 2 | 1 | 1 | 1 | 1 | 1 | 1 | 2 | 3 | 1 | 2 | 2 | 3 | 3 | 3 | 4 | 4 | 38 |
| 6. | Letter | 0 | 1 | 0 | 1 | 1 | 0 | 0 | 0 | 0 | 0 | 1 | 1 | 1 | 1 | 1 | 1 | 0 | 1 | 1 | 1 | 12 |
| 7. | Short Survey | 2 | 0 | 1 | 1 | 1 | 0 | 1 | 0 | 1 | 0 | 1 | 0 | 1 | 0 | 1 | 0 | 0 | 0 | 0 | 1 | 11 |
| 8. | Note | 1 | 0 | 0 | 1 | 0 | 0 | 0 | 1 | 1 | 1 | 0 | 0 | 1 | 0 | 0 | 0 | 1 | 1 | 1 | 1 | 10 |
| **Total** | | **147** | **155** | **204** | **206** | **242** | **244** | **237** | **226** | **223** | **228** | **237** | **261** | **290** | **355** | **424** | **443** | **427** | **426** | **439** | **576** | **5990** |

The table 6 revels that year wise distribution of literature output in Punjab agricultural university, among the total articles, in the year 2020 has been published 491 articles, followed by the year 2016 has been published 372 articles. 31 Conference papers mostly published in the year 2020 and 28 book chapters published in the year 2020.

## Priority Index and Activity Index

Priority Index (PI) has been calculated to properly normalize the size of Literature Output and the size of the subject field so that cross international comparisons can be done for these "Frontier" areas of research on research Output in Punjab Agricultural University.

Priority Index is computed by the following formula:

$$\text{Priority Index} = \frac{N_{ij}/N_{io}}{N_{oj}/N_{oo}} \times 100$$

where,

$N_{ij}$ = the number of publications of country i in subfield j

$N_{io}$ = the number of publications of country i is in all subfields of the major fields

$N_{oj}$ = the number of publications of all countries viz., the total world output in subfield j

$N_{oo}$ = the number of publications in all sub fields of those major fields

This index is identical to AI proposed (by Frame 1977) and subsequently used among others by Schubert and Braun (Schubert 1986 and Carpenter *et al.* 1988, Carpenter 1988). The value of PI = 100 indicates that research priority of a country for a given subfield corresponds precisely to the average of all countries.

PI = 100 indicates average priority,
PI > 100 indicates higher than average priority and
PI < 100 lower than average priority

It should, however, be kept in mind that (by virtue of definition of PI), no Literature can have high or low priority in all sub fields. From the values of PI, we can compare

(1) The priorities of a given country to different subfields in a given time span
(2) The priorities of different countries to a given subfield in a given time span
(3) The priority to a given subfield in different time spans.

**Table – 7: Activity Index and Priority Index of Punjab Agricultural University Articles Output**

| S.No | Year | R.O./P of Articles | COP=A | W.O/P | WOP=B | A/B=AI Value | PI Value |
|---|---|---|---|---|---|---|---|
| 1. | 2001 | 127 | 2.56 | 147 | 2.45 | 1.04 | 104 |
| 2. | 2002 | 134 | 2.70 | 155 | 2.59 | 1.04 | 104 |
| 3. | 2003 | 179 | 3.61 | 204 | 3.41 | 1.06 | 106 |
| 4. | 2004 | 174 | 3.51 | 206 | 3.44 | 1.02 | 102 |
| 5. | 2005 | 210 | 4.23 | 242 | 4.04 | 1.05 | 105 |
| 6. | 2006 | 211 | 4.25 | 244 | 4.07 | 1.04 | 104 |
| 7. | 2007 | 196 | 3.95 | 237 | 3.96 | 1.00 | 100 |
| 8. | 2008 | 187 | 3.77 | 226 | 3.77 | 1.00 | 100 |
| 9. | 2009 | 176 | 3.55 | 223 | 3.72 | 0.95 | 95 |
| 10. | 2010 | 179 | 3.61 | 228 | 3.81 | 0.95 | 95 |
| 11. | 2011 | 182 | 3.67 | 237 | 3.95 | 0.93 | 93 |
| 12. | 2012 | 204 | 4.11 | 261 | 4.35 | 0.94 | 94 |
| 13. | 2013 | 230 | 4.64 | 290 | 4.84 | 0.96 | 96 |
| 14. | 2014 | 292 | 5.89 | 355 | 5.93 | 0.99 | 99 |
| 15. | 2015 | 357 | 7.20 | 424 | 7.08 | 1.02 | 102 |
| 16. | 2016 | 372 | 7.50 | 443 | 7.40 | 1.01 | 101 |
| 17. | 2017 | 353 | 7.13 | 427 | 7.13 | 1.00 | 100 |
| 18. | 2018 | 348 | 7.02 | 426 | 7.11 | 0.99 | 99 |
| 19. | 2019 | 357 | 7.20 | 439 | 7.33 | 0.98 | 98 |
| 20. | 2020 | 491 | 9.90 | 576 | 9.62 | 1.03 | 103 |
| | Total | 4959 | 100.00 | 5990 | 100.00 | 20.00 | |

The table 7 indicates the Activity Index and Priority Index values the output on Punjab Agricultural University Article research outputs during the years 2001 to 2020. The PI value is measured higher than 100 (PI >100) enjoys a higher priority at global level, less than 100 (PI <100) is low priority and round value of 100 (PI=100) is of average priority considering the world output.

The years 2001 (104), 2002 (104), 2003 (106), 2004 (102), 2005 (105), 2006 (104), 2015 (102), 2016 (101) and 2020 (103) have high priority among the selected periods. The years 2009 (95), 2010 (95), 2011 (93), 2012 (94), 2013 (96), 2014 (99), 2018 (99) and 2019 (98) are having the lowest priority with PI value being less than 100 and the remaining years 2007, 2008 and 2017 are having average priority with PI value being round value of 100. So that period's

publication is higher level to calculate the world output of Punjab Agricultural University Article research.

## Conclusions

The scientometirc assessment of global research output on Punjab Agricultural University research literacy has been the central theme of the paper. The analysis was carried out on basis of 5990 records retrieved from Scopus. The study is limited in that the documents available only from Scopus were considered for the scientometric analysis. There is scope for the researcher to conduct more in-depth study by taking the data from web of science or also the databases representing the content in regional language.

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# Global analysis of retractions in COVID-19 publications

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## Abstract

*In recent years published articles are retracted for various reasons, the two main reasons are publishing the documents without the citations and duplicate publication. Some articles are published even there are having process like review before publishing, some articles flawed and get published. The present study was to identify the retracted articles of the COVID-19 publications in terms of bibliometric analysis using Scopus database. Total of 92 COVID-19 related retracted papers were downloaded from year 2020 to 24th febraury'2022. 31 articles were excluded from the analysis which are related to retract. Total 61 articles were taken in the account for the bibliometric analysis. In the year 2021 the number of retraction publication is 46 with 75.41% and in the publication stage retraction, only 5 documents in press. English is the only language in retracted documents, no other languages. Only 6 documents were paid access rest of the article were open access. Most of the retractions were indexed as "Erratum" (55 articles more than 90% of the total articles) in the Scopus database. All the retractions are from Journals in source type there were no conference proceedings, book chapter, and book. The international publishers like Elsevier B.V. Springer, John Wiley, Taylor and Francis Ltd. and so on listed in this retraction list.*

**Keywords:** *Retraction, Bibliometrics, COVID-19, Publication ethics*

## Introduction

The COVID-19 pandemic has created an unexpected global response for the scientific related publications on the pandemic, till 2019 there were only 53 articles on coronavirus within a year (i.e. 2020) more than 70,000 publications regarding the COVID-19 or the related pandemic have been published, in the year more than one lakh articles were published as on 24.02.2022 the published articles related to COVID is crossed two lakhs publication i.e. 215815. In recent years published articles are retracted for various reasons, the two main reasons are publishing the documents without the citations and duplicate publication.

Some articles are published even there are having process like review before publishing some articles flawed and get published. To avoid such publications the publishers are using the eminent tool named retraction to deal with the condition. According to Oxford English Dictionary (https ://oxfordlearnersdictionaries.com/definition/american_english/retraction), a retraction is "the action of withdrawing a statement, accusation, etc., which is now admitted to be erroneous or unjustified recantation; an instance of this; a statement of making such a withdrawal". Scientific misconduct means "fabrication, falsification or plagiarism in proposing, performing or reviewing research or in reporting research results" according to the Research Integrity of the US Office (https ://ori.hhs.gov/definition -misconduct ).

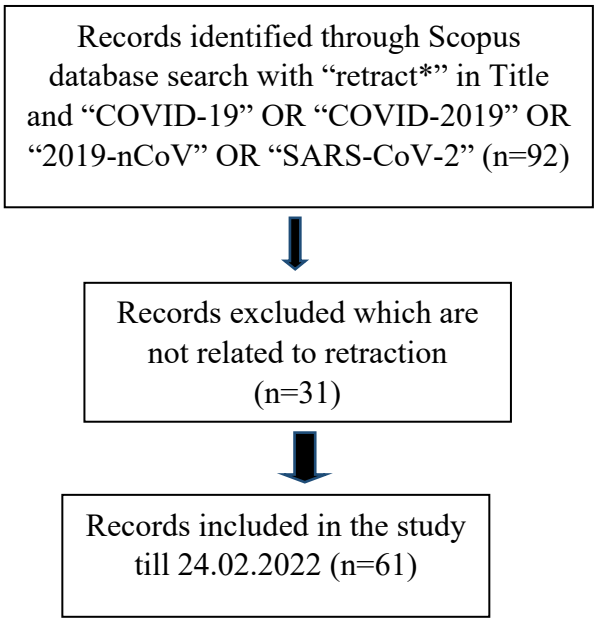
The main reasons behind the scientific misbehaviour are "publish or perish" and "a gap in knowledge" Mousavi and Abdollahi (2020). Plagiarism is the main reason including self-plagiarism among the retraction notices Chambers et al. (2019). According to Fanelli (2013), scientists, researchers and journal editors are improved by increasing number of retractions this shows a worthy sign that at identifying and rejecting the fake or wrong papers. Rapani et al. (2020) very recently found that in the dental literature India was ranked in the top position in the retracted publications with about 28% and in an overall India stands one of the top five positions in the retractions (Bhatt 2020). These are the motivation behind this study.

## Material and methods

Various search strategies were used for similar studies on retraction to produce bibliographic records pertaining to retracted publications. Lei & Zhang (2018) looked for the keyword "retract*" in titles of articles indexed in PubMed but limited the article type to "retracted publications," while Aspura et al. (2018) looked for the same keyword in Web of Science and SCOPUS.

Scopus database was used to download the information about the retracted piblications among the COVID-19 articles in global level. The following search criteria has been applied in article titles "Retract*" AND article titles "COVID-19" OR "COVID-2019" OR "2019-nCoV" OR "SARS-CoV-2." On 24.02.2022, we retrieved the data according to the strategy shown in Figure1. The search results shows 92 records, of which 31 were non-retractions, thus, we analysed this single 61 retraction articles.

**Figure-1: Search Strategy**




## Results and discussion

### Characteristics of retracted articles

Table -1 categorises the retractions, based on the following criteria:

- Year
- Publication stage
- Language
- Document type
- Access type
- Source of retractions
- Funding source of retractions
- Authorship
- Institutional affiliation
- Nationality

Characteristics of retracted publications globally from 2020 to 2022 (up to 24.02.2022)are listed in the table-1, there were no retracted publications on COVID-19 till 2019 and there were only 53 articles published before 2020, but in 2020 the number of articles published is 72,876 and the retracted article is 12 in

2021 the number of articles published is 1,23,232 and the retracted articles is 46 with 75.41% and in 2022 up to 24th February the published documents is 19,650 and the retracted documents is 3. In the publication stage retraction only 5 documents in press, 56 documents are published and retracted. English is the only language in retracted documents, no other languages. Only 6 documents were paid access rest of the article were open access. Most of the retractions were indexed as "Erratum"(55 articles more than 90% of the total articles) in the Scopus database, only two retractions are indexed as "Retracted". "Bronze Green" is the largest share of open access article is under the category access type with twenty two articles. The 6 articles were published in paid access rest of the articles are open access that is more than 90%.

**Table – 1 Characteristics of retracted articles**

| **Description** | | **No. of Articles** | **Share %** |
|---|---|---|---|
| Year | 2020 | 12 | 19.67 |
| | 2021 | 46 | 75.41 |
| | 2022 | 3 | 4.92 |
| | | | |
| Publication Stage | Final | 56 | 91.80 |
| | Article in Press | 5 | 8.20 |
| | | | |
| Language | English | 61 | 100.00 |
| | | | |
| Document Type | Erratum | 55 | 90.16 |
| | Article | 3 | 4.92 |
| | Retracted | 2 | 3.28 |
| | Letter | 1 | 1.64 |
| | | | |
| Access Type | | | |
| Open Access | Bronze, Green | 22 | 36.07 |
| | Gold, Green | 16 | 26.23 |
| | Bronze | 11 | 18.03 |
| | Green | 3 | 4.92 |
| | Hybrid Gold, Green | 2 | 3.28 |
| | Gold | 1 | 1.64 |
| Paid Access | | 6 | 9.84 |
| | | | |

| | | | |
|---|---|---|---|
| Source | Journals | 61 | 100 |
| | | | |
| Funding Sources | Non-funded | 58 | 95.08 |
| | Funded | 2 | 3.28 |
| | Not available | 1 | 1.64 |
| | | | |
| Authorship | Single Author | 38 | 62.30 |
| | Two authors | 4 | 6.56 |
| | Three authors | 8 | 13.11 |
| | More than three authors | 11 | 18.03 |
| | | | |
| Institutional Affiliation | Author from same Institution | 41 | 67.21 |
| | Author from more than one Institution | 20 | 32.79 |
| | | | |
| Nationality | Single country publications | 51 | 83.61 |
| | International collaborated publications | 10 | 16.39 |
| | | | |

The retracted articles are Journals no Conference proceedings or Book chapter is published. Out of 61 articles only two articles are funded and one article the details are not available. Single author dominated in the retracted publications with Sixty two percent, more than 18% articles were written by more than three authors. 67% of the authors published from the same institution affiliation and only 16% were International collaborated publications.

## Words and phrases

Various notations were used in the article titles for the retraction, table-2 shows the words and phrases of the retracted publications. More than one-third of the retractions used "Retraction" and nearly 15% of the retractions usedthe phrases "Retraction notice to", only five retractions used "Retracted Article" and four used four other word and phrases ("Retracted", "Retraction Note", "Retraction Note to" and "Retraction notice"). "Retraction Statement" phrases was used for three

retractions. Two used two other phrases ("Retraction to" and "Statement of Retraction").

**Table-2 Words and phrases used in retractions**

| Word or phrase | No. of Retraction | Share % |
|---|---|---|
| Retraction | 24 | 39.34 |
| Retraction notice to | 9 | 14.75 |
| Retracted Article | 5 | 8.20 |
| Retracted | 4 | 6.56 |
| Retraction Note | 4 | 6.56 |
| Retraction Note to | 4 | 6.56 |
| Retraction notice | 4 | 6.56 |
| Retraction Statement | 3 | 4.92 |
| Retraction to | 2 | 3.28 |
| Statement of Retraction | 2 | 3.28 |
| **Total** | **61** | **100** |

## Journals with retraction publications

In source type there were no conference proceedings, book chapter, and book. All the retractions are from Journals, table-3 shows the journals with retractions, 61 retractions are from 47 journals. Among this 47 journals *Early Human Development* published four retraction articles. *International Journal of Clinical Practice, Scientific Reports and Viruses* published three retraction articles. Thirty eight journals had at least one retracted publications.

**Table-3 Journals with retractions**

| Journals with retractions | No. of Retraction | Share % |
|---|---|---|
| Early Human Development | 4 | 8.51 |
| International Journal of Clinical Practice | 3 | 6.38 |
| Scientific Reports | 3 | 6.38 |
| Viruses | 3 | 6.38 |
| Journal of Primary Care and Community Health | 2 | 4.26 |
| The Gerontologist | **2** | 4.26 |

| | | |
|---|---|---|
| The Lancet | 2 | 4.26 |
| The Lancet Global Health | 2 | 4.26 |
| Transplantation | 2 | 4.26 |
| Others (Journals with one retractions) | 38 | 51.06 |
| **Total** | **61** | 100.00 |

## Publishers with retraction publications

Table-4 list the publishers that had retracted publications. The international publishers like Elsevier B.V. Springer, John Wiley, Taylor and Francis Ltd. and so on listed in this retraction list. The top two publishers Elsevier B.V. and NLM (Medline) had 18 retraction publications, followed by Springer with seven retraction publications. Ten publisher's had single retraction publications.

**Table-4Publishers with retraction publications**

| **Publisher** | **No. of Retraction** | **Share %** |
|---|---|---|
| Elsevier B.V. | 9 | 14.75 |
| NLM (Medline) | 9 | 14.75 |
| Springer | 7 | 11.48 |
| SAGE Publications | 6 | 9.84 |
| John Wiley and Sons Inc | 4 | 6.56 |
| MDPI | 3 | 4.92 |
| Nature Research | 3 | 4.92 |
| Future Medicine Ltd. | 2 | 3.28 |
| Lancet Publishing Group | 2 | 3.28 |
| Mary Ann Liebert Inc. | 2 | 3.28 |
| Taylor and Francis Ltd. | 2 | 3.28 |
| Wolters Kluwer Medknow Publications | 2 | 3.28 |
| Others (publisher with one retractions) | 10 | 16.40 |
| **Total** | **61** | **100** |

## Conclusion

The study has analysed retraction of 61COVID-19 publications in terms of bibliometric analysis indexed in Scopus, in the year 2020 to 24th February2022. In the year 2021 the number of retraction publication is 46 with 75.41% and in the

publication stage retraction only 5 documents in press, 56 documents are published and retracted. English is the only language in retracted documents, no other languages. Only 6 documents were paid access rest of the article were open access. Most of the retractions were indexed as "Erratum" (55 articles more than 90% of the total articles) in the Scopus database. All the retractions are from Journals in source type there were no conference proceedings, book chapter, and book. The international publishers like Elsevier B.V. Springer, John Wiley, Taylor and Francis Ltd. and so on listed in this retraction list. There are some limitations in this study. First, we have not analysed retraction publication on COVI-19 before 2020. Second we had used only SCOPUS database for this retraction publication on COVI-19, citations are not analysed due to very short gap in publication and retraction years. Reason for the retraction was not analysed in this study since most of the retraction publication has no proper reason.

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# Analysis of Open Access Scholarly Journals in Computer Science

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**Abstract**

*The present study is based on the data taken from the Directory of Open Access Journals (DOAJ), a database of fully open access peer-reviewed scholarly journals. The prime objective of the study is to explore quantitatively the inclusion of Computer Science Journals from several perspectives. It is found that there are 291 computer science journals indexed in DOAJ published from 54 countries in 22 different languages. The Study found that, countries like United Kingdom, Indonesia and USA publications are more in this portal and English is the most common communication language. Most of the journals do not charge article processing charges (APCs). Majority journals are Peer Reviewed journals. Only 15.46 percent of the journals got DOAJ Seal (tag). DOAJ special tag/designation. Contribution of Elsevier, Springer and Wiley publishers is more compared to other publications during the study period.*

**Key words**: *Open Access journals, Computer Science, DOAJ*

## 1. Introduction

The impact of information communication and technology has revolutionized the way people communicate, and education is no exception. The traditional classroom has been replaced with a classroom without walls, resulting in a paradigm shift in the mechanism of knowledge transfer. In the scholarly community, the internet has transformed the way information is exchanged. It has gained traction as a critical and indispensable tool in the scholarly realm, and a vast body of material is freely available. The word "open access" refers to the free and unrestricted availability of literature.

According to Budapest Open Initiative (BOAI) 'open access' to the literature, means its free availability on the public internet, permitting any users to read, download, copy, distribute, print, search, or link to the full texts of these articles, crawl them for indexing, pass them as data to software, or use them for any other lawful purpose, without financial, legal, or technical barriers other than those inseparable from gaining access to the internet itself.

The only restriction on reproduction and distribution, and the only purpose for copyright in this area, should be to allow writers control over their work's integrity and the right to be properly acknowledged and cited. This is the most often used definition to this day. The Directory of Open Access Journals (DOAJ) was founded in 2003, marking the first major step forward in the open access movement. DOAJ is a community-curated online directory that indexes and makes high-quality, open-access, peer-reviewed journals available to the public. All DOAJ services, including being indexed in DAOJ, are free. All of the information is available for free. DOAJ currently has 17,499 journals and 7,252,843 articles from 130 countries around the world.

## 2. Objectives

The main objectives of the study is to anlyse various aspects of open access journals in the field of computer science registered in the Directory of Open Access Journals (DOAJ).

- To examine the geographical distribution of journals;
- To find out the language-wise distribution of journals;
- To discover the type of licensing;
- To study Peer revived type of Journals.

## 3. Methodology

In the present study, the Directory of Open Access Journals (DOAJ) was selected as the source of identification of the open access journals in the field of computer science. About 290 journals in the field of computer science were available on DOAJ website till 25th February 2022.

## 4. Data analysis and interpretation

### 4.1 Geographical wise distribution of journals

The geographical wise distribution of computer science journals is shown in Table 1.

**Table 1: Geographical-wise distribution of journals**

| S.No | Name of the Country | Number | Percentage |
|---|---|---|---|
| 1 | UK | 58 | 19.93127 |
| 2 | Indonesia | 45 | 15.46392 |
| 3 | USA | 18 | 6.185567 |
| 4 | Poland | 15 | 5.154639 |
| 5 | Romania | 13 | 4.467354 |
| 6 | Russia | 11 | 3.780069 |
| 7 | China | 9 | 3.092784 |
| 8 | Netherlands | 7 | 2.405498 |
| 9 | France | 6 | 2.061856 |
| 10 | Germany | 6 | 2.061856 |
| 11 | Iran | 6 | 2.061856 |
| 12 | Ukkrain | 6 | 2.061856 |
| 13 | Brazil | 5 | 1.718213 |
| 14 | Singapore | 5 | 1.718213 |
| 15 | Belguim | 4 | 1.37457 |
| 16 | Spain | 4 | 1.37457 |
| 17 | Other Countries | 73 | 25.08591 |
| **TOTAL** | | **291** | **100** |

Table 1 shows that out 291 computer science journals, 58 journals (19.93%) have United Kingdom have contributed, followed by Indonesia (15.46%), USA (6.18%), Poland (5.15%) and Romania (4.47%) respectively. These five countries have contributed more than fifty percent o the open access journals in the field of computer science. The remaining percent of the journals are contributed by other countries including India.

### 4.2 Publisher wise distribution of journals

The publisher wise distribution of computer science journals is shown in Table 2.

**Table 2: Publishes wise distribution of journals**

| S.No | Name of the Publisher | Journals | Percentage |
|---|---|---|---|
| 1 | Elsevier | 19 | 6.52921 |
| 2 | Springer | 12 | 4.123711 |
| 3 | Wiley | 12 | 4.123711 |
| 4 | Hindawi Limited | 10 | 3.436426 |

| | | | |
|---|---|---|---|
| 5 | MDPI AG | 9 | 3.092784 |
| 6 | Frontiers Media S.A. | 7 | 2.405498 |
| 7 | Sciendo | 7 | 2.405498 |
| 8 | European Alliance for Innovation (EAI) | 4 | 1.37457 |
| 9 | Oxford University Press | 4 | 1.37457 |
| 14 | 5 publishers 3 journals each | 15 | 5.154639 |
| 23 | 9 publishers 2 journals each | 18 | 6.185567 |
| 391 | 174 publishers 1 journal each | 174 | 59.79381 |
| **TOTAL** | | **291** | **100.00** |

Table 2 presents the distribution of the 291 journals across different types of publishers. Open access journals in the field of computer science have been found to be published by a number of publishers across globe. Elsevier publishers is the maximum number of journals (19, 6.53%) followed by Springer and Wiley (12, 4.12% each), Hindawi Limited (10, 3.43%), MDPI AG (9, 3.09%), Frontiers Media S.A. and Sciendo (7, 2.41% each), European Alliance for Innovation (EAI) and Oxford University Press (4, 1.38% each) respectively. Five publishers had 3 journals, nine publishers had 2 journals and 174 publishers (59.79%) had a single publication of journals.

### 4.3 Language wise distribution of journals

The language wise distribution of computer science journals is shown in Table 3.

**Table 3: Language wise distribution of journals**

| S.No | Language | Journals | Percentage |
|---|---|---|---|
| 1 | English | 152 | 52.23368 |
| 2 | Indonesian | 33 | 11.34021 |
| 3 | Russian | 16 | 5.498282 |
| 4 | Spanish | 12 | 4.123711 |
| 5 | Portuguese | 6 | 2.061856 |
| 6 | Ukrainian | 6 | 2.061856 |
| 7 | French | 5 | 1.718213 |
| 8 | Chinese | 3 | 1.030928 |
| 9 | Bi-Lingual language (English and other one) | 29 | 9.965636 |
| 10 | Tri-Lingual language (English and other two) | 21 | 7.216495 |

| | | | |
|---|---|---|---|
| 11 | Quadra-Lingual Journals (English and other three) | 6 | 2.061856 |
| 12 | Penta-Lingual Journals (English and more than three) | 2 | 0.687285 |
| **TOTAL** | | **291** | **100** |

Table 3 reveals that all the 291 open access journals in the field of computer science have been published in different languages with English being the most widely used mode of knowledge communication followed by Indonesian and Russian languages.

### 4.4 Article Processing Charges

The distribution of open accessing journals in the field of computer science according to the article processing charges is shown in Table 4.

**Table 4: Article processing charges in the field of OA computer science journals**

| S.No | Processing charge | Number | Percentage |
|---|---|---|---|
| 1 | Yes | 138 | 47.42 |
| 2 | No | 153 | 52.58 |
| **TOTAL** | | **291** | **100.00** |

Table 4 shows that out of 291 journals in the field of computer science, 153 (52.58%) journals have no article processing charges and 138 (47.42%) journals ask for an article processing charges.

### 4.5 DOAJ Seal

The distribution of open accessing journals in the field of computer science according to the DOAJ seal is shown in Table 5.

**Table 5: DOAJ seal status in the OA journals of Computer Science**

| S.No | DOAJ Seal | Number | Percentage |
|---|---|---|---|
| 1 | Yes | 45 | 15.46 |
| 2 | No | 246 | 84.54 |
| **TOTAL** | | **291** | **100.00** |

Table 4 shows that out 291 journals, 246 (84.54%) journals do not have the DOAJ seal and 45 (15.46%) journals have the DOAJ seal.

### 4.6 Peer reviewed process of OA journals

The distribution open access journals in the field of computer science according to the peer review process are shown in Table 6.

**Table 6- Peer review types of journals in the field of computer science**

| S.No | Type of Review | Number | Percentage |
|---|---|---|---|
| 1 | Blind Peer Review | 158 | 54.30 |
| 2 | Double Blind Peer Review | 89 | 30.58 |
| 3 | Peer Review | 33 | 11.34 |
| 4 | Open Peer Review | 10 | 3.44 |
| 5 | Post publication review | 01 | 0.34 |
| **TOTAL** | | **291** | **100.00** |

Table 6 shows that 54.30 percent of the open access journals in the field of computer science are blind peer review, 89 (30.58%) journals are double blind peer review, 33 (11.34%) journals are peer review, 10 (3.44%) journals are open peer review and only 1 (0.34%) journal is post publication review.

### 4.7 Findings

1. Majority contribution of the open access journals in the field of computer science came from United Kingdom, Indonesia, USA, Poland and Romania by contributing 51.17 percent of the journals in DOAJ portal.
2. Elsevier publisher is the major contributor to DOAJ portal in the field of computer science open access journals.
3. Majority of the OA journals in the field of computer science are contributed in English language journals are more compared to any other language journals.
4. More than fifty percent of the OA journals in the field of computer science open access journals are not collecting any article processing charges or publishing charges from the authors.
5. Only 15.46 percent of the journals got DOAJ Seal (tag) in the field of computer science open access journals publications.
6. The study analyzed the quality wise distribution of the journals in the field of computer science open access journals, 84.88% of the journals are blind peer review and double-blind peer review journals respectively.

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# A Bibliometric study of ph.d. Awarded theses in department of telugu studies of central university of hyderabad during the period 1984-2004.

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**ABSTRACT**

*Bibliometric study considers as the scientific study of statistical analysis of written communications. These written communications include such as books, theses and dissertations journal articles, etc. These methods use for the quantitative analysis of any research work or literature work. This bibliometric study is used in the field of library and Information science to find academic literature. In this study identified that that a total of 71 dissertations have been submitted to the Telugu Department, University of Hyderabad for award of Ph.D. theses degrees during the study period i.e. 1984 to 2004. Comparatively, more number of theses submitted in the year of 1997 i.e. 12 (16.90%) have been submitted and ranked I, and also found after gender analysis, there are 70.42 % i.e. 50 Ph.D. theses have been submitted by the male research scholars. The supervisedfaculty members also been studied and presented here.*

## 1.0. Introduction:

The user satisfaction is the main aim of any institutional library. The information explosion is always giving challenges to the library professionals to identify a correct and accurate reading documents for the library. The selection of a document is depending on different acceptable techniques and various tools. The bibliometric study is one of the universal accepted technic to identify correct reading documents like Manuals, Handbooks, Textbooks, Periodicals, Magazine, etc. The bibliometric study is a dynamic study to identify the pattern of authorship and journal coverages in multi dimensional subject areas of various subject domains in nationally and internationally. The bibliometric study helps to find accurate information resources for effective and efficient use. The most of bibliometric

study has been carried out in nationally and internationally on various subject domains or areas.

## Bibliometrics:

The word bibliometric is derived from the combination of two Latin words. That is "Biblio" and "Metrics". The" Bybl"means Book, paper a"Metricus" means measurement. The study first used and applied to analyze the paper publication in the comparative anatomy subject in 1917 by F.J.Cole and N.B.Eales. Later this study carried out by the Hulme in 1923. The both designed this study as "Statistical Binliography" and application of quantitative and statistical technique to the library and bibliographic work also. After this, there are lots of studies entered in library and information science field as metric study namely, Informetrics, Scientrometrics. Nowadays, the library and the Information Center are adopting new techniques and technologies to give effective an efficient service to their users. The bibliometric study is a technique and application of statistical study which is used in the library information center to find the patterns of publication. Hulme states that the importance of the study "The purpose of statistical bibliography is to shed light on the process of written communication and of the nature and course of development of a discipline by means of counting and analysis its various facets of written communication".

There are two types of bibliographical studies:

1) Descriptive studies:
   The Descriptive studies are the study deals with various features of literature and covers the subject matter, medium of communication and volume of information.
2) Behavioral studies:
   The Behavioral studies are the study deals the bibliometric relationship between different documents.

**The Department of Telugu, School of Humanities, University of Hyderabad**

The University of Hyderabad is one of the top most central University in India. This University is offering different types of subject areas to pursue integrated, PG and Research program in various subject fields. Central University of Hyderabad has 12 Schools of study, in which 46 different Departments and centers have been organized. The Schools of study are: the school of Physics, Mathematics, Life Sciences, Computer and Information Science, School of Chemistry, School of Engineering and Science and Technology, Humanities, Social Sciences,

Economics and Fine Arts and performing Arts, Management Studies, Medical Sciences etc.

The Department of Telugu has started in UOH with registration for Ph.D. Program in Telugu at the Centre for Regional Studies, School of Social Sciences. After a few years, this became an independent department for the year 1985. On the Telugu literature, the department of Telugu conducted national and international level conference and seminars. The main aim of this department is to emphasize and conduct Ph.D. theses degrees in the areas: Such as grammar, comparative study, folk literature, lexicography, machine translation and various aspects of classical modern research literature etc.

## METHODOLOGY

This chapter deals with the investigation and the methodology employed for data analysis. The bibliometrics has evolved, applied statistical and mathematical techniques to find the bibliometric units. This study has given the importance, especially during the period of the last two decades of Ph.D theses in the research field of Telugu Literature. This study completely focused to studythe number of PH.D these distributed in the subject literature and the growth of the subject.The present investigation was carried out to study thecharacteristics of literature and Ph.D theses submitted and supervised by the researchesand faculty in the field of Telugu Language andLiterature. The study is concerned with the analysis of 71 doctoraltheses awarded by the University of Hyderabadduring the period from 1984 to 2004in the field of Telugu Language and Literature and its sub-disciplines. The present study, observed the Distribution of theses in Telugu Language andLiterature and its sub-disciplines by the supervisors in two decades.

## OBJECTIVES

# The objectives of the study

- To identify the quantity of Ph.D. thesis research has conducted in the Telugu department of the School of Humanities, University of Hyderabad during the twenty years of study during the period from 1984 to 2004.
- To understand the year-wise submission of Ph.D. theses, research thesis in the Department of Telugu from 1984-2004
- To know the gender-wise submissions of Ph.D theses
- To know the number of faculty who supervised the PhD. work

## Data Analysis Method

The data collected from "Information Booklet:TeluguM.Phill. Dissertations and Ph.D theses1978-2011". The data systematically organized and tabulated through using MS Exell, and data were compared for analyses using a percentage method.

.Gender-wise analysis of Ph.D. thesis presented by supervisors in Telugu Department, University of Hyderabad and percentages are calculated as mentioned in the table1**.**

**Table:1**

| Sl..No | Gender | No of Dissertations awarded by the supervisor | Parentage |
|---|---|---|---|
| 1 | Male | 50 | 70.42 |
| 2 | Female | 21 | 29.58 |
| | **Total** | **71** | **100.00** |

It can be noticed from the above table that out of the total 71 theses submitted, 50 (i.e. 70.42%) have been distributed by the male supervisors. Whereas 21i.e. (29.58%) have been submitted by the female supervisors.

The Year-wise submission of Ph.D. theses is presented in table 2 and analyzed, percentages have been calculated and ranked to know the year-wise submissions.

**Table:.2 The distribution of Ph.D. theses by the supervisors of Department of Telugu, University of Hyderabad.**

| SL. No | Years | No of dissertation | Cumulative total | no thesis percentage | Cumulative percentage |
|---|---|---|---|---|---|
| 1 | 1984 | 2 | 2 | 2.82 | 2.82 |
| 2 | 1986 | 3 | 5 | 4.23 | 7.05 |
| 3 | 1988 | 5 | 10 | 7.04 | 14.1 |
| 4 | 1990 | 3 | 13 | 4.23 | 18.33 |
| 5 | 1992 | 2 | 15 | 2.82 | 21.15 |
| 6 | 1993 | 5 | 20 | 7.04 | 28.19 |
| 7 | 1994 | 4 | 24 | 5.63 | 33.82 |

| | | | | | |
|---|---|---|---|---|---|
| 8 | 1996 | 2 | 26 | 2.82 | 36.64 |
| 9 | 1997 | 12 | 38 | 16.90 | 53.54 |
| 10 | 1998 | 10 | 48 | 14.08 | 67.62 |
| 11 | 1999 | 7 | 55 | 9.86 | 77.48 |
| 12 | 2001 | 3 | 58 | 4.23 | 81.71 |
| 13 | 2002 | 2 | 60 | 2.82 | 84.53 |
| 14 | 2003 | 5 | 65 | 7.04 | 91.57 |
| 15 | 2004 | 6 | 71 | 8.45 | 100.00 |

It can be analyzed and noticed from the table 2 that the total Ph.D. theses submitted in the Telugu department are 71 during the study period of twenty years i.e. from 1984 to 2004. More number of theses i.e. 12 (16.90%) have been submitted in the years 1997 as ranked I, whereas the 2(2.82%) theses in the year 1984, 3 (4.23%)theses in the year of 1986, 5 (7.04%)theses in the year of 1988, 3 (4.23%)theses in the year of 1990,2(2.82%)dissertations in the year of 1992, 5 (7.04%) dissertations in the year 1993, 4(5.63%) dissertations in the year of 1994,2 (2.82%)theses in the year of 1996, 10(14.08%) theses in the year 1998, 7(9.86%)theses in the year of 1999, 3 (4.23%)theses in the year of 2001, 2 (2.82%) theses in the year of 2002, 5 (7.04%) theses in the year of 2003, 6 (8.45%)theses in the year of 2004.

**The distribution of Ph.D. theses according to the Supervisors in the Telugu Department Table-3**

**Table.3. The distribution of Ph.D. theses according to the Supervisors in the Telugu Department.**

| Sl.No | SUPERWISER | The Number of Ph.D. awarded | Percentage |
|---|---|---|---|
| 1. | VirabadraRao.K | 4 | 5.63 |
| 2. | Subramanyam. G.V | 12 | 16.90 |
| 3. | Aananda laxmi.C | 12 | 16.90 |
| 4. | Rangacharya K.K. | 8 | 11.27 |
| 5. | Shri Hari. R | 7 | 9.86 |
| 6. | Veerabadrayya.M | 7 | 9.86 |

| | | | |
|---|---|---|---|
| 7. | Ramanarasimham.P | 4 | 5.63 |
| 8. | Raju. N | 8 | 11.27 |
| 9. | Sharathjyosthna.S | 7 | 9.86 |
| 10. | Ramulu.P | 1 | 1.41 |
| 11. | Aruna Kumari.G | 1 | 1.41 |
| | **TOTAL** | **71** | **100.00** |

The table 3 shows that the name of the faculty and the number of the research scholars supervised during the period of twenty years i.e. 1984 to 2004.Identified and analyzed that, the 11 faculty members, who supervised the Ph.D. research scholars during their research work. It is noticed from the above table that prof.Subramanyam. G. V and prof. Aananda Laxmi.Cboth have supervised to more number of research scholars, i.e. 12 (16.90%). followed by Dr. P. Ramuluand Dr. Aruna kumari G. have supervised a very less number of theses. i.e. 01 (01.41%). Similarly,VirabadraRao.Khas supervised 4 theses (5.63%), Rangacharya K.K has supervised 8theses (11.27%), Shri Hari. R, Sharathjyosthna.S and Veerabadrayya.Mhas supervised 7 theses (9.86%), Ramanarasimham.Phas supervised 4 theses (5.63%), Raju. N has supervised 8 theses (11.27%) respectively.

**Researchers gender-wise distribution of Ph.D. awarded theses**

Gender-wise researcher's distribution of Ph.D. awarded theses in the Telugu presented in table.4.

**Table -4**

| Sr. No | Research scholars | Total Number of Theses from 1984-2004 | Percentage |
|---|---|---|---|
| **1** | Female | 32 | 45.07 |
| **2** | Male | 39 | 54.93 |
| | **Total** | **71** | **100** |

It is clearly seen from Table - 4 that the majority of the researchers' 54.93% who carried out research work in the Department of Telugu Studies for their Ph.D. program were men. Less number of researchers 45.07% were who carried out research work were women during the period 1984-2004.

# Findings

- A total of 71 Ph.D. theses has been submitted to the Telugu department, University of Hyderabad, during the period 1984 to 2004.
- It is found that more number of theses i.e.12 (16.90%) have been submitted during the years 1997 and 10 (14.08%) in the year of 1998 has ranked I and ranked II.
- It is found that out of the total 71 Ph.D. theses has submitted to the Telugu department, 50 theses i.e. (70.42%) have been submitted by the male supervisors whereas 21Ph.D. Theses (i.e.29.58%) have been submitted by the female supervisors.
- And also found that prof. Subramanyam. G. V and prof. Aananda Laxmi.Cboth have a supervise number of research scholars and awarded 12 (16.90%) number of Ph.D. thesis, during the study period of twenty years i.e. from 1984 to 2004.

## CONCLUSION

The bibliometric analysis reveals that 71 theses have been submitted to the Telugu department, University of Hyderabad for award of Ph.D. degrees, during the study period of twenty years from 1984 to 2004. A good number of theses have been submitted every year, but during the years 1997 and 1998, in the year of 1997 the highest number i.e.12 (16.90%) and (14.08%) theses have been submitted. The gender analysis reveals that 70.42% of theses have been supervised by the male supervisors. Thus the Telugu department of University of Hyderabad is contributing new and innovative knowledge in the field of The Telugu subject area by conducting research.

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# Journal of Library and Information Studies: A Citation Analysis

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## Abstract

*This paper deals with the analysis of the 123 contributions of the open access journal entitled 'Journal of Library and Information Studies' published during 2011-2020. The study revealed that most of the contributions are contributed by multiple authors. The total average publication per author is 0.54 from 123 articles with 226 authors. The overall degree of collaboration is 0.62 i.e., 47 articles are single authored and 76 articles are multiple authored publications. Journals, Conference/seminar proceedings and Books are the most preferred source of information. The majority of the journal citations (69.11%) and book citations (51.01|%) in open access journal of library and information studies are contributed by multiple authors.*

**Keywords**: *Citation analysis, Journals, Bibliometrics, Degree of Collaboration*

## 1. Introduction

At present librarians are facing many problems due to the rising costs of journals every year, ever increasing demands of the reading community for getting new journals and diminishing budgetary provision to meet the user requirements. It is becoming necessary for them to identify core journals in different disciplines in order to procure useful journals within the given financial resources for providing effective service to the users in the library.

Citation analysis, which is one of the areas of bibliometrics, can be used for indentifying the core journals and for knowing the characteristic features of the discipline such as authorship pattern, scatter of literature in different bibliographic forms and in different subjects etc. Gross and Gross user for the first time this citation analysis as a tool for identifying the core journals in a subject based on counting the citations given at the end of each article from a group of primary journals. Afterwards, a number of such studies were carried out on citations in dissertations/theses, books, primary journals and reviewing journals.

Journal of Library and Information Studies (JLIS) was formerly known as the National Taiwan University Journal of Library Science. It was first published in 1967 and was the first scholarly journal for library science researchers in Taiwan. The journal was renamed in 1999 in order to represent the expanding scope and diverse interests in the current library and information communities. Today, JLIS adopts double-blind peer-review in its evaluation of all received manuscripts. It is considered as one of the best LIS scholarly journals in the Chinese speaking world. In the 2008 journal ranking by the Department of the Humanities and Social Sciences of the National Science Council, JLIS was ranked as a first-class LIS journal. JLIS is also a forerunner of open access journals. In 1997 it began to make its content freely available via the Internet. JLIS also follows The Budapest Open Access Initiative (BOAI): "it's free availability on the public internet, permitting any users to read, download, copy, distribute, print, search, or link to the full texts of these articles, crawl them for indexing, pass them as data to software, or use them for any other lawful purpose, without financial, legal, or technical barriers other than those inseparable from gaining access to the internet itself."

## 2. Objectives of the study

The objectives of the study are:

i. Year-wise distribution of contributions of the journal;
ii. To understand distribution of citations by volume wise;
iii. To examine the authorship pattern of contributions
iv. To examine the average number of citations per article in the journal;
v. To examine the authorship pattern of books and journals; and

## 3. Scope

The scope of the present study is limited to analyse the publications trends of an online open access Journal of Library and Information Studies. The scope is further limited to ten years from (2011 –2020).

## 4. Methodology

For the purpose of this study, the Journal of Library and Information Studies (JLIS) has been selected as the source journal. 20 issues of 10 volumes from 2011 to 2020 have been selected for the study. The data collected from the online version of journal of library and information studies (https://jlis.lis.ntu.edu.tw/html/journal-52.htm) accessible in DOAJ. 123 research papers were retrieved from 10 volumes and collected data was coded in Ms-Excel sheet for analysis and statistical inferences. The data interpretation was done based on the volume and year wise distribution of articles, number of citations, authorship pattern books and journals, degree of collaboration etc.

## 5. Data Analysis

### 5.1 Volume wise distribution of contributions

The distribution of contributions according to the year and volume wise is shown in Table 1.

Table 1 describes the distribution of contributions year wise in Journal of Library and Information Studies and found that 123 contributions were published during the period of 10 years (2011-2020). Out of 123 articles, the highest number of articles (15) published in the year 2015 and the lowest articles (11) published in the year 2019.

Table 1: year wise and volume wise number of contributions published

| Year | Volume Number | No. of Issues | No. of Contributions |
|---|---|---|---|
| 2011 | 9 | 2 | 12 |
| 2012 | 10 | 2 | 12 |
| 2013 | 11 | 2 | 12 |
| 2014 | 12 | 2 | 12 |
| 2015 | 13 | 2 | 15 |
| 2016 | 14 | 2 | 12 |
| 2017 | 15 | 2 | 12 |
| 2018 | 16 | 2 | 12 |
| 2019 | 17 | 2 | 11 |
| 2020 | 18 | 2 | 13 |
| **Total** | | **20** | **123** |

### 5.2 Volume wise authorship pattern of contributions

The authorship pattern of contributions according to the year and volume wise is shown in Table 2.

Table 2: Volume wise authorship pattern of contributions

| Year | Volume | Number of Authors | | | | Total |
|---|---|---|---|---|---|---|
| | | Single | Double | Three | More than Three | |
| 2011 | 9 | 5 | 5 | 1 | 1 | 12 |
| 2012 | 10 | 3 | 7 | 2 | 0 | 12 |
| 2013 | 11 | 3 | 9 | 0 | 0 | 12 |
| 2014 | 12 | 7 | 5 | 0 | 0 | 12 |
| 2015 | 13 | 7 | 7 | 1 | 0 | 15 |
| 2016 | 14 | 3 | 8 | 1 | 0 | 12 |
| 2017 | 15 | 4 | 5 | 1 | 1 | 11 |
| 2018 | 16 | 5 | 6 | 1 | 0 | 12 |
| 2019 | 17 | 6 | 4 | 1 | 1 | 12 |
| 2020 | 18 | 4 | 5 | 0 | 4 | 13 |
| **Total** | | **47** | **61** | **8** | **7** | **123** |

Table 2 describes the volume wise authorship pattern of articles and found that the total number of authors is 123, in which there are 47 single authors publications, 61 two authors publications, 8 three authors publications, 7 more than three publications.

### 5.3 Author Productivity

The author productivity of contributions published in Journal of Library and Information Studies is shown in Table 3.

Table 3 depicts the author productivity of articles published in open access Journal of Library and Information Studies during period of study (2011-2020) and resolved that the total average publication per author is 0.54 from 123 articles with 226 authors. In 2011, 2012, 2013 and 2014, the average publication per author was found was increasing trend i.e. 0.52, 0.55, 0.57 and 0.71 respectively whereas, in 2015 -2020 except 2018 was decreasing trend.

**Table 3: Author productivity**

| Year | Number of Articles | Number of Authors | Average publication per author |
|---|---|---|---|
| 2011 | 12 | 23 | 0.52 |
| 2012 | 12 | 22 | 0.55 |
| 2013 | 12 | 21 | 0.57 |
| 2014 | 12 | 17 | 0.71 |
| 2015 | 15 | 24 | 0.63 |
| 2016 | 12 | 22 | 0.55 |
| 2017 | 11 | 22 | 0.50 |
| 2018 | 12 | 20 | 0.60 |
| 2019 | 12 | 23 | 0.52 |
| 2020 | 13 | 32 | 0.41 |
| **Total** | **123** | **226** | **0.54** |

### 5.4 Degree of Collaboration

The degree of collaboration of articles published in the open access Journal of Library and Information Studies is shown in Table 4.

To calculate degree of collaboration, a formula suggested by Subramanianm (1983) is used. It is expressed as:

$$DC = \frac{Nm}{Nm + Ns}$$

Where, DC is the Degree of Collaboration, Nm is the multiple authored publications and Ns is the number of single authored publications.

**Table 4: Degree of Collaboration**

| Year | Single Authored Publications (Ns) | Multiple Authored Publications (Nm) | Nm+Ns | Degree of Collaboration DC=Nm/(Nm+Ns) |
|---|---|---|---|---|
| 2011 | 5 | 7 | 12 | 0.58 |
| 2012 | 3 | 9 | 12 | 0.75 |
| 2013 | 3 | 9 | 12 | 0.75 |
| 2014 | 7 | 5 | 12 | 0.42 |
| 2015 | 7 | 8 | 15 | 0.53 |
| 2016 | 3 | 9 | 12 | 0.75 |
| 2017 | 4 | 7 | 11 | 0.64 |
| 2018 | 5 | 7 | 12 | 0.58 |

| | | | | |
|---|---|---|---|---|
| 2019 | 6 | 6 | 12 | 0.50 |
| 2020 | 4 | 9 | 13 | 0.69 |
| **Total** | **47** | **76** | **123** | **0.62** |

Table 4 gives the degree of collaboration of articles published in the open access Journal of Library and Information Studies during the period of study. It shows the trend in patterns of single and joint authorship in the publication. The analysis resolved that the overall degree of collaboration is 0.62 i.e., 47 articles are singled authored and 76 articles are multiple authored publications. It indicated that in 2012, 2013, and 2016, the Degree of Collaboration was found high degree i.e. 0.75 and the lowest degree of collaboration was found in 2014 i.e.0.42.
Distribution of citations

### 5.5 Volume and year wise citations

The distribution of citations according to the year wise and volume wise is shown in Table 6.

Table 6: Year wise and volume wise distribution of citations

| Year | Volume | Number of citations | Percentage |
|---|---|---|---|
| 2011 | 9 | 509 | 9.50 |
| 2012 | 10 | 409 | 7.63 |
| 2013 | 11 | 439 | 8.19 |
| 2014 | 12 | 411 | 7.67 |
| 2015 | 13 | 662 | 12.35 |
| 2016 | 14 | 555 | 10.36 |
| 2017 | 15 | 481 | 8.98 |
| 2018 | 16 | 625 | 11.66 |
| 2019 | 17 | 546 | 10.19 |
| 2020 | 18 | 722 | 13.47 |
| **Total** | | **5359** | **100.00** |

Table6 indicates that the 10 volumes have 5359 citations appended to the 123 articles. Out of 5359 citations, vol. 18 has the highest number i.e., 722 (13.47%) and vol. 10 has the lowest number i.e. 409 (7.63%). Total 5359 citations have been recorded in 123 contributions therefore the average number of citations per contribution is 43.57.

### 5.6 Bibliographic forms

The distribution of citations in different bibliographic forms in source journal is shown in Table 7.

**Table 7: Bibliographic form wise distribution of citations**

| Bibliographic forms | Number | Percentage |
|---|---|---|
| Books | 992 | 18.51 |
| Journals | 2393 | 44.65 |
| Conference/seminar proceeding | 1077 | 20.10 |
| Reports | 156 | 2.91 |
| Theses/dissertations | 263 | 4.91 |
| Web Resources | 409 | 7.63 |
| Others | 69 | 12.87 |
| TOTAL | 5359 | |

Table 7 shows that journals contributed to the highest number of citations accounting to 44.65 percent of total citations in source journal. Conference/seminar proceedings secured second highest number of citations accounting to 20.10 percent of total citations. Books secured third highest number of citations accounting to 18.51 percent of total citations. Hence, these three forms are most preferred source of information for the research scholars in library and information science professionals.

### 5.7 Authorship pattern of journals

The distribution of articles according to the authorship pattern in source journal is shown in Table 8.

**Table 8: Authorship pattern of journals articles in source journal**

| Authorship pattern | Number | Percentage |
|---|---|---|
| One author | 1075 | 44.92 |
| Two authors | 737 | 30.80 |
| Three authors | 324 | 13.54 |
| Four authors | 147 | 6.14 |
| Five authors | 57 | 2.38 |
| Six authors | 25 | 1.05 |

| | | |
|---|---|---|
| Seven authors | 24 | 1.00 |
| Eight authors | 1 | 0.04 |
| Ten authors | 2 | 0.09 |
| Twelve authors | 1 | 0.04 |
| **TOTAL** | 2393 | 100.00 |

Table 8 shows that out of 2393 journal citations in source journal, 1075 (44.92%) citations were contributed by sole authors, 737 (30.89%) by two authors, 324 (13.54%) by three authors, 147 (6.14%) by four authors, 57 (2.38%) by five authors, 25 (1.05%) by six authors, 24 (1%) by seven authors, 1 (0.04%) each by eight authors and twelve authors respectively and 2 (0.09%) by ten authors. It can be concluded that majority of the journal citations in open access journal of library and information studies are contributed by multiple authors.

5.8 **Authorship pattern of books**

The distribution of books according to the authorship pattern in source journal is shown in Table 9.

**Table 9: Authorship pattern of books**

| Authorship pattern | Number | Percentage |
|---|---|---|
| One author | 486 | 48.99 |
| Two authors | 293 | 29.54 |
| Three authors | 121 | 12.20 |
| More than three authors | 92 | 9.27 |
| **TOTAL** | **992** | **100.00** |

Table 9 shows that out of 992 book citations in source journal, 486 (48.99%) citations were contributed by single authors, 293 (29.54%) by two authors, 121 (12.20%) by three authors, and 92 (9.27%) by more than three authors. It can be concluded that majority of the book citations in open access journal of library and information studies are contributed by multiple authors.

**Findings**

i. Out of 123 articles, the highest number of articles (15) published in the year 2015 and the lowest articles (11) published in the year 2019.

ii. Out of 123 contributions, 47 single authors publications, 61 two authors publications, 8 three authors publications, 7 more than three publications.

iii. The author productivity of articles published in open access Journal of Library and Information Studies during period of study (2011-2020) and resolved that the total average publication per author is 0.54 from 123 articles with 226 authors.

iv. In 2011, 2012, 2013 and 2014, the average publication per author was found was increasing trend i.e. 0.52, 0.55, 0.57 and 0.71 respectively whereas, in 2015 -2020 except 2018 was decreasing trend.

v. The overall degree of collaboration is 0.62 i.e., 47 articles are singled authored and 76 articles are multiple authored publications.

vi. In the year 2012, 2013, and 2016, the Degree of Collaboration was found high degree i.e. 0.75 and the lowest degree of collaboration was found in 2014 i.e.0.42.

vii. Out of 5359 citations, vol. 18 has the highest number i.e., 722 (13.47%) and vol. 10 has the lowest number i.e. 409 (7.63%). Total 5359 citations have been recorded in 123 contributions therefore the average number of citations per contribution is 43.57.

viii. The Journals (44.65%), Conference/seminar proceedings (20.10%) and Books (18.51%) are most preferred source of information for the research scholars in library and information science professionals compared to other sources.

ix. The majority of the journal citations (69.11%) in open access journal of library and information studies are contributed by multiple authors compared to single authors.

x. More than half of the book citations (51.01%) in open access journal of library and information studies are contributed by multiple authors when compared to single authors.

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# Journal Citation Pattern of Doctoral Theses in the field of Image Processing: A Scientometric Study

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**Abstract**

*The present study is based on 3657 citations, cited in the 29 theses submitted to Acharya Nagarjuna University, Guntur, Andhra Pradesh for the award of the doctoral degree in Computer Science and Engineering in the specialization of Image Processing. It has been carried out bibliographic form-wise distribution of citations, ranked list of journals and application of Bradford's Law of Scattering. Journals and Proceedings of conference/seminars/conventions/workshops etc. are considered to be the most frequently information source rather than other sources. Distribution of cited journals in the field of image processing clearly indicates that 592 journals are contributing to 1626 citations. There are 13 journals in the nucleus and they are the most productive journals in the field of image processing, sharing 2.20% of the total journals. The journal distribution as per Bradford's zone in the field of image processing is in the ratio of 13: 106: 473. Ranked list of journals in specialization of image processing shows that the journal entitled 'IEEE Transactions on Pattern Analysis, Machine Intelligence' gets the first rank for being cited more number of times with 6.70 percent of total citations*

**Keywords**: *Scientometric study, image processing, computer science, journal citations*

## 1. Introduction

Image processing is a method to perform some operations on an image, in order to get an enhanced image or to extract some useful information from it. It is a type of signal processing in which input is an image and output may be image or characteristics/features associated with that image. Nowadays, image processing is among rapidly growing technologies. It forms core research area within engineering and computer science disciplines too. Image processing basically includes the following three steps, namely (i) Importing the image via image acquisition tools; (ii) Analysing and manipulating the image; and (iii)Output in which result can be altered image or report that is based on image analysis. The Scientometric Study is undertaken to focus on the assessment of strength and weakness in the field of image processing research performance in an national and international context and discussed the identification of patterns of scientific development particularly the mapping of research activities of varied institutions, organisaions, scholars/researchers.

## 2. Objectives of the study

The objectives of the study:

1. To know the various sources of information consulted by the researchers in the field of image processing;
2. To examine the core journals of image processing; and
3. To examine the applicability of Bradford's Law of Scattering to the pattern of journals used by the researchers in image processing.

## 3. Materials and Methods

In the present study, the data was primarily obtained from doctoral theses in Computer Science and Engineering particularly in the field of Image Processing. The study examination of 29 doctoral theses submitted by research scholars in specialization of image processing field to Acharya Nagarjuna University, Guntur, Andhra Pradesh, India. The researchers have identified 3657 citations for analysis as a part of this study with every thesis contributing 121 citations on average. The authors studied all the appended citations as appearing in the submitted theses in the specialization of networking. The authors examined the citations and recorded findings on significant aspects like author types, bibliographic forms, name of the journal, year of publication etc. Ulrich's International Periodical Directory was referred to obtain information on cited journals, such as the publishing country, the relevant subject, which was then transcribed in the reference cards and later entered into Ms-Excel work sheet. Finally, the data processing was done through a tool i.e. the Statistical Package for Social Sciences (SPSS).

## 4. Data Analysis

### 4.1 Bibliographic forms in the field of image processing

Table 1 shows the bibliographic form wise distribution of citations in the field of image processing.

**Table 1: Bibliographic form-wise distribution of citations in the field of image processing**

| Bibliographic forms | Number of Citations | Percentage |
|---|---|---|
| Journals | 1626 | 44.46 |
| Conference/ Seminar/Convention/ Workshop/ symposiums etc. | 855 | 23.38 |
| Books | 855 | 23.38 |
| Websites | 105 | 2.87 |
| Reports | 79 | 2.16 |
| Theses/ Dissertations | 53 | 1.45 |
| Lecture notes | 48 | 1.31 |
| Others | 36 | 0.99 |
| **TOTAL** | **3657** | **100.00** |

Table 1 shows that journals contribute the highest number of citations, accounting for 44.46 percent of the total citations. Conferences/Seminars/ Conventions/Workshops/Symposiums etc. and books secured the second highest number of citations, accounting for 23.38 percent of the total citations respectively, followed by websites (2.87%), reports (2.16%), thesis and dissertations (1.45%), and lecture notes (1.31%). The remaining 0.99 percent of citations is found in other bibliographic forms. Hence, it can be concluded from the table that the research scholars in the field of image processing use journals mostly for their research work when compared to other bibliographic forms.

### 4.2 Ranking of journals

The rank list of cited journals in the field of image processing is presented in Table 2.

**Table 2: Ranks list of journals in the field of image processing**

| S. No | Name of the journal | Citations | | | Cumulative | |
|---|---|---|---|---|---|---|
| | | Rank | No | % | No | % |
| 1 | IEEE Transactions on Pattern Analysis, Machine Intelligence | 1 | 109 | 6.703567 | 109 | 6.703567 |
| 2 | IEEE Transactions on Image Processing | 2 | 90 | 5.535055 | 199 | 12.23862 |
| 3 | Pattern Recognition | 3 | 88 | 5.412054 | 287 | 17.658 |
| 4 | IEEE Transactions on Systems, Man and Cybernetics | 4 | 55 | 3.382534 | 342 | 21.03321 |
| 5 | Pattern Recognition Letters | 5 | 42 | 2.583026 | 384 | 23.61624 |
| 6 | Journal of Nuclear Medicine | 6 | 28 | 1.722017 | 412 | 25.33825 |
| 7 | Circulation Research | 7 | 27 | 1.660517 | 439 | 26.99877 |
| 8 | International Journal of computer vision | 8 | 23 | 1.414514 | 462 | 28.41328 |
| 9 | IEEE Transactions on Circuits Systems for Video Technology | 9 | 20 | 1.230012 | 482 | 29.6433 |
| 10 | IEEE Transactions on Neural Networks | 10 | 19 | 1.168512 | 501 | 30.81181 |
| 11 | IEEE Transactions on Medical Imaging | 11 | 17 | 1.04551 | 518 | 31.85732 |
| 12 | Image and Vision Computing | 12 | 16 | 0.98401 | 534 | 32.84133 |
| 13 | Computer Vision, Graphics and Image Processing | 13 | 15 | 0.922509 | 549 | 33.76384 |
| 14 | International Journal of Computer Applications | 13 | 15 | 0.922509 | 564 | 34.68635 |
| 15 | Journal of Clinical Investigation | 14 | 14 | 0.861 009 | 578 | 35.54736 |
| 16 | IEEE Transactions on | 15 | 13 | 0.98401 | 591 | 36.53137 |

| | | | | | | |
|---|---|---|---|---|---|---|
| | Knowledge and Data Engineering | | | | | |
| 17 | Journal of Biological Chemistry | 15 | 13 | 0.799508 | 604 | 37.33087 |
| 18 | Signal Process, Image Communications | 15 | 13 | 0.799508 | 617 | 38.13038 |
| 19 | IEEE Transactions on Signal Processing | 16 | 12 | 0.738007 | 629 | 38.86839 |
| 20 | Australasian Journal of Combinatorics | 17 | 11 | 0.676507 | 640 | 39.5449 |
| 21 | Nature | 17 | 11 | 0.676507 | 651 | 40.2214 |
| 22 | IEEE Transactions on Fuzzy Systems | 18 | 10 | 0.615006 | 661 | 40.83641 |
| 23 | IEEE Transactions on Information Theory | 18 | 10 | 0.615006 | 671 | 41.45141 |
| 24 | Diabetes | 19 | 9 | 0.553506 | 680 | 42.00492 |
| 25 | Discrete Mathematics | 19 | 9 | 0.553506 | 689 | 42.55843 |
| 26 | IEEE Transactions on Acoustics, Speech, and Signal Processing | 19 | 9 | 0.553506 | 698 | 43.11193 |
| 27 | IEEE Transactions on Communications | 19 | 9 | 0.553506 | 707 | 43.66544 |
| 28 | Journal of Electronic Imaging | 19 | 9 | 0.553506 | 716 | 44.21894 |
| 29 | IEEE Pattern analysis and machine intelligence | 20 | 8 | 0.492005 | 724 | 44.71095 |
| 30 | IEEE Transactions on Pattern Recognition | 20 | 8 | 0.492005 | 732 | 45.20295 |
| 31 | IEEE Transactions on Pattern Recognition and Machine Intelligence | 20 | 8 | 0.492005 | 740 | 45.69496 |
| 32 | Computer Vision and Image Understanding | 21 | 7 | 0.430504 | 747 | 46.12546 |
| 33 | IEEE Transactions on Computers | 21 | 7 | 0.430504 | 754 | 46.55597 |
| 34 | IEEE Transactions on Multimedia | 21 | 7 | 0.430504 | 761 | 46.98647 |
| 35 | International Journal of | 21 | 7 | 0.430504 | 768 | 47.41698 |

| | | | | | | |
|---|---|---|---|---|---|---|
| | Engineering Science and Technology | | | | | |
| 36 | Journal of Computer Science | 21 | 7 | 0.430504 | 775 | 47.84748 |
| 37 | The American Journal of Cardiology | 21 | 7 | 0.430504 | 782 | 48.27798 |
| 38 | Arteriosclerosis, Thrombosis, and Vascular Biology | 22 | 6 | 0.369004 | 788 | 48.64699 |
| 39 | Expert Systems with Applications | 22 | 6 | 0.369004 | 794 | 49.01599 |
| 40 | IEEE Transactions on Pattern Analysis | 22 | 6 | 0.369004 | 800 | 49.38499 |
| 41 | Information Fusion | 22 | 6 | 0.369004 | 806 | 49.754 |
| 42 | International Journal of Remote Sensing | 22 | 6 | 0.369004 | 812 | 50.123 |
| 43 | Journal of Visual Communication and Image Representation | 22 | 6 | 0.369004 | 818 | 50.49201 |
| 44 | Remote Sensing of Environment | 22 | 6 | 0.369004 | 824 | 50.86101 |
| 45 | Speech communication | 22 | 6 | 0.369004 | 830 | 51.23001 |
| 46 | Utilitas Mathematica | 22 | 6 | 0.369004 | 836 | 51.59902 |
| 47 | Association for Computing Machinery (ACM) Transactions on Graphics | 23 | 5 | 0.307503 | 841 | 51.90652 |
| 48 | Computer Graphics Forum | 23 | 5 | 0.307503 | 846 | 52.21403 |
| 49 | Diabetes Care | 23 | 5 | 0.307503 | 851 | 52.52153 |
| 50 | Fuzzy Sets and Systems | 23 | 5 | 0.307503 | 856 | 52.82903 |
| 51 | International Journal of Computer Science and Network Security | 23 | 5 | 0.307503 | 861 | 53.13653 |
| 52 | International Journal of Computer Science Issues | 23 | 5 | 0.307503 | 866 | 53.44404 |
| 53 | Journal of Cognitive Neuroscience | 23 | 5 | 0.307503 | 871 | 53.75154 |

| | | | | | | |
|---|---|---|---|---|---|---|
| 54 | Journal of Machine Learning Research | 23 | 5 | 0.307503 | 876 | 54.05904 |
| 55 | Journal of the Acoustical Society of America | 23 | 5 | 0.307503 | 881 | 54.36655 |
| 56 | Journal of the Optical Society of America | 23 | 5 | 0.307503 | 886 | 54.67405 |
| 57 | Nature Medicine | 23 | 5 | 0.307503 | 891 | 54.98155 |
| 58 | The Journal of Combinatorial Mathematics and Combinatorial Computing | 23 | 5 | 0.307503 | 896 | 55.28906 |
| 76 | 18 journals with 4 citations | 24 | 72 | 4.428044 | 968 | 59.7171 |
| 103 | 27 journals with 3 citations | 25 | 81 | 4.981549 | 1049 | 64.69865 |
| 191 | 88 journals with 2 citations | 26 | 176 | 10.824108 | 1225 | 75.52276 |
| 592 | 401 journals with 1 citation | 27 | 401 | 24.661746 | 1626 | 100.1845 |

Table 5.20 shows that the journal citations cited by researchers in the field of image processing are scattered in 592 journals. Among them, 'IEEE Transactions on Pattern Analysis, Machine Intelligence' gets the first rank for being cited more number of times with 6.70 percent of total citations, followed by 'IEEE Transactions on Image Processing' (5.53%), 'Pattern Recognition' (5.41%), 'IEEE Transactions on Systems, Man and Cybernetics' (3.38%) and 'Pattern Recognition Letters' (2.58%).

### 4.3 Application of Bradford Law

Bradford's Law states that "if scientific journals are arranged in order of decreasing productivity of articles on a given field that may be divided into a nucleus of journals are more particularly devoted to the subject field and several groups of zones containing the same number of articles as the nucleus when the number of journals in the nucleus and succeeding zones will be as $1:n:n^2$ where 'n' is multiplier.

The distribution of journals and corresponding number of citations in three zones in the field of image processing is presented in Table 3.

**Table 3: Bradford's Zones for Image Processing journal citations**

| Zones | Number of Journals | Number of Citations | Percentage of Journals |
|---|---|---|---|
| I (Core) | 13 | 549 | 2.20 |
| II | 106 | 532 | 17.91 |
| III | 473 | 545 | 79.89 |
| **TOTAL** | **592** | **1626** | **100.00** |

It is obvious from Table 5.32 that there are 13 journals in the nucleus and they are the most productive journals in the field of image processing, sharing 2.20% of the total journals; the second zone is represented by 106 journals, which share 17.91% of the total cited journals and last zone is represented by 473 journals that share 79.89% of the total cited journals. As per the Bradford's law of scattering the ratio is 13: 106: 473. Hence the application of Bradford's law scattering of the image processing shows that the three zones are identified on the basis of approximately geometric series in the form of $1:n:n^2$ . The relationship of the each zone in the present table is 13: 106: 473. Expected calculated ratio was 1: 8.15: 66.42 and appeared result is 1: 8.15: 36.38. Therefore it does fitwell into the law.

'F' stands for Finding, 'R' stands for Result and 'E' stands for expected result.
$F = 1:n:n^2$
R = 1: 8.15: 36.38
E = 1: 8.15: 66.42

## 5. Findings

i. Journals contribute the highest number of citations, accounting for 44.46 percent of the total citations. Conferences/Seminars/ Conventions/ Workshops/Symposiums etc. and books secured the second highest number of citations, accounting for 23.38 percent of the total citations respectively, followed by websites (2.87%), reports (2.16%), thesis and dissertations (1.45%), and lecture notes (1.31%). The remaining 0.99 percent of citations is found in other bibliographic forms.

ii. The journal citations cited by researchers in the field of image processing are scattered in 592 journals. Among them, 'IEEE Transactions on Pattern Analysis, Machine Intelligence' gets the first rank for being cited more

number of times with 6.70 percent of total citations, followed by 'IEEE Transactions on Image Processing' (5.53%), 'Pattern Recognition' (5.41%), 'IEEE Transactions on Systems, Man and Cybernetics' (3.38%) and 'Pattern Recognition Letters' (2.58%).

iii. There are 13 journals in the nucleus and they are the most productive journals in the field of image processing, sharing 2.20% of the total journals; the second zone is represented by 106 journals, which share 17.91% of the total cited journals and last zone is represented by 473 journals that share 79.89% of the total cited journals. Hence, the journal distribution as per Bradford's zone in the field of image processing is in the ratio of 13: 106: 473.

## 6. Conclusion

Researchers in the field of image processing have referred journals compared to other bibliographic forms. Bradford law of Scattering does fit well. Scientormetric analysis and ranking of journals is considered is very useful tools in selecting the library information sources with the limited budget. Scientrometric analysis also helps in finding the information sources that are important for research work in a given subject field. The ranking list of journals pertaining to the field of image processing helps the researchers and scientists to select the journals which are more important their specialization.

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# Citation Analysis of Phd Theses in Education Accepted By Bangalore Unversityduring 2012-2021

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## Abstract
*The present study investigates the use pattern of literature as revealed through the citation analysis of PHD theses submitted to the department of education Bangalore University, Bangalore, during the period from 2012 to 2021. This study was comprised to use of different information sources by the research scholars of the university. There were 4403 citations appended in 34 doctoral theses. The study shows that year wise distribution, form wise distribution, ranking list of cited journals and authorship pattern and etc. The data were collected from the bibliographic section carried out citation analysis to find out the answers for the objectives of the present study.*

**Keywords:** *Citation analysis; PhD Theses; Education; Bangalore University; Authorship Patterns.*

## 1. Introduction
Citation study is generally used as a tool in collection development. Libraries must have strong and active collections to keep abreast with changing needs of its users. Changing trends in research areas and information seeking behavior of users are factors that libraries need to study in order to provide collections and services that fulfill the information needs of their clients. Citation analysis provides information on the use of citations or literature in journals, books, thesis and other materials. In analyzing the citations, the frequency of the journal title, type and age of the resources used, place of publication, language and frequency of the author are analyzed to study. It helps to pointed out the way to revise the collection and the services to allow the librarians to better serve the needs of the library users from the present to the future. Education theses are the open access resources available at Shodhaganga website.

## 2. Scope and limitation of the study

The present study is based on citation analysis of Ph.D. theses in education submitted to the Department of education. The study is based on 4403 citations appended at the end of 34 Ph.D. theses in education awarded by Bangalore University Bangalore, Bangalore. The span of 10 years was taken into consideration that is from 2012 to 2021.

## 3. Objectives of the Study

1. To find out the year wise submission of Theses.
2. To know the gender wise distribution of Theses
3. To know the average number of citations per Theses.
4. To examine the different form of literature used by the researcher in education theses.
5. To prepare a list of ranking of journals
6. To examine the authorship patterns and degree of collaboration in citations
7. To find out Subject wise distribution of citations.

## 4. Methodology

The present study is Bibliometrics method used for collecting and analysing the data. The study was conducted on citation analysis of PhD theses in education subject selected as the source of data during 2012-to 2021. All the bibliographical details of 34 thesis were enter in to MS Excel sheet and each reference were categorized according to the format like author, title, year, publishers etc. and analysed according to objective of the study like year wise submission of theses, gender wise, form wise submission etc.

## 5. Data Analysis

**Table-.1 : Year wise submission of doctoral theses in education**

| Sl No | Year | No of thesis submission | % | No of Citations | % |
|---|---|---|---|---|---|
| 1 | 2021 | 3 | 8.82 | 132 | |
| 2 | 2020 | 3 | 8.82 | 443 | |
| 3 | 2019 | 8 | 23.53 | 768 | |
| 4 | 2018 | 4 | 11.77 | 512 | |
| 5 | 2017 | 1 | 2.94 | 92 | |
| 6 | 2016 | 2 | 5.88 | 329 | |
| 7 | 2015 | 1 | 2.94 | 268 | |
| 8 | 2014 | 4 | 11.76 | 477 | |
| 9 | 2013 | 5 | 14.71 | 609 | |
| 10 | 2012 | 3 | 8.83 | 773 | |
| | | 34 | 100 | 4403 | |

Table.1 shows that submission of Doctoral Theses in Education during the period 1974 to 2014. The highest number of theses was submitted in 2019 account of 8 (23.53%) theses. Followed by 5 (14.71%) Theses submitted in 2013, 4(11.76% ) in 2014 and 2018 respectively.

**Table-.2 Gender wise Distribution of PhD theses**

| Sl No | Gender | No of theses | Percentage |
|---|---|---|---|
| 1 | Male Researchers | 20 | 58.82 |
| 2 | Female Researcher | 14 | 41.18 |
| | | 34 | 100 |

It can be observed from table no.2. Shows that out of 34 researchers, there are 20(58.82%) males and 14(41.18%) are female researchers. This shows that there is lack of awareness to research in females than males in the subject Education. This indicates that male researcher is dominant then female researcher in their subject.

**Table-.3: Average Citation per Thesis**

| sl no | Year | No of theses | No of Citations | Average citation per thesis |
|---|---|---|---|---|
| 1 | 2021 | 3 | 132 | 44 |
| 2 | 2020 | 3 | 443 | 147.66 |
| 3 | 2019 | 8 | 768 | 96 |
| 4 | 2018 | 4 | 512 | 128 |
| 5 | 2017 | 1 | 92 | 92 |
| 6 | 2016 | 2 | 329 | 164 |
| 7 | 2015 | 1 | 268 | 268 |
| 8 | 2014 | 4 | 477 | 119 |
| 9 | 2013 | 5 | 609 | 121.8 |
| 10 | 2012 | 3 | 773 | 257.66 |
| | | 34 | 4403 | 129.5 |

Table.3shows that average number of citations per thesis during 2014-2021. It is found that a total of 4403 citations distributed over 34 theses. The result shows that the average number of citations received per thesis is 169.08 was found in the study.

**Table.4: Bibliographic Form-wise distribution of Citations**

| Sl No. | Rank No. | Bibliographic Form | No. of Citations | % | Cumulative citation | Cumulative percentage |
|---|---|---|---|---|---|---|
| 1 | 1 | Journals | 2233 | 50.72 | 2233 | 50.72 |
| 2 | 2 | Books | 912 | 20.71 | 3145 | 71.43 |
| 3 | 3 | Web resources | 662 | 3.32 | 3291 | 74.75 |
| 4 | 4 | Thesis/Dissertations | 283 | 6.43 | 3574 | 81.18 |
| 5 | 5 | Reports | 146 | 15.03 | 4236 | 96.21 |
| 6 | 6 | Incomplete references | 85 | 0.86 | 4274 | 97.07 |
| 7 | 7 | Reference sources | 38 | 0.82 | 4310 | 97.89 |
| 8 | 8 | Conferences Proceedings | 36 | 0.18 | 4318 | 98.07 |
| 9 | 9 | News papers | 8 | 1.93 | 4403 | 100 |
| | | Total | **4403** | **100** | | |

It is observed from the table.4represents Bibliographic form wise distribution of citations. The study revealed that journals are the most cited sources with 2233(50.72%). Books are the second place accounting for 912(20.71%). Followed by web resources with 662(3.32%), thesis and dissertation with 283 and respectively. This indicates that Journals are the major sources used by the researcher in field of education and books are the second preferred source of information.

## Table.5:Ranking of cited Journals

| S.No. | Rank | Journals | No. of Citations | % | Cumulative Citation | Cumulative % | Country of Origin |
|---|---|---|---|---|---|---|---|
| 1 | 1 | Indian Educational Review | 80 | 3.6 | 80 | 3.6 | India |
| 2 | 2 | Journal of Applied Psychology | 73 | 3.3 | 153 | 6.9 | USA |
| 3 | 3 | Journal of Educational Research | 62 | 2.8 | 215 | 9.6 | USA |
| 4 | 4 | Journal of Educational Psychology | 59 | 2.6 | 274 | 12 | USA |
| 5 | 5 | Edutracks | 51 | 2.3 | 325 | 15 | India |
| 6 | 6 | Dissertation Abstracts International | 45 | 2 | 370 | 17 | USA |
| 7 | 7 | Developmental Psychology | 43 | 1.9 | 413 | 18 | USA |
| 8 | 8 | Child Development | 42 | 1.9 | 455 | 20 | USA |
| 9 | 9 | Asian Journal of Psychology And Education | 31 | 1.4 | 486 | 22 | India |
| 10 | 10 | Journal of Educational Research And Extension. | 30 | 1.3 | 516 | 23 | India |
| 11 | 11 | Journal of Indian Education | 27 | 1.2 | 543 | 24 | India |
| 12 | 11 | Teaching And Teacher Education | 27 | 1.2 | 570 | 26 | Netherlands |
| 13 | 12 | Indian Journal of Applied Research | 20 | 0.9 | 590 | 26 | India |
| 14 | 13 | American Educational Research Journal | 18 | 0.8 | 608 | 27 | USA |
| 15 | 13 | Journal of Youth And Adolescence | 18 | 0.8 | 626 | 28 | USA |
| 16 | 13 | Educational Psychology | 18 | 0.8 | 644 | 29 | USA |

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| 17 | 14 | School Community Journal | 17 | 0.8 | 661 | 30 | USA |
| 18 | 14 | American Psychologist | 17 | 0.8 | 678 | 30 | USA |
| 19 | 15 | Sociology of Education | 16 | 0.7 | 694 | 31 | USA |
| 20 | 16 | Journal of Early Adolescence | 15 | 0.7 | 709 | 32 | USA |
| 21 | 17 | Indian Stream Research Journal | 14 | 0.6 | 723 | 32 | India |
| 22 | 18 | American Sociological Review | 13 | 0.6 | 736 | 33 | USA |
| 23 | 18 | International Indexed And Refereed Research Journal | 13 | 0.6 | 749 | 34 | India |
| 24 | 18 | Educational Review | 13 | 0.6 | 762 | 34 | USA |
| 25 | 19 | Review of Educational Research | 12 | 0.5 | 774 | 35 | USA |
| 26 | 19 | Journal of Education And Practice | 12 | 0.5 | 786 | 35 | UK |
| 27 | 20 | IOSR Journal of Research And Method In Education | 11 | 0.5 | 797 | 36 | India |
| 28 | 21 | Journal of Marriage And The Family | 10 | 0.5 | 807 | 36 | USA |
| 29 | 21 | Journal of Organizational Behaviour | 10 | 0.5 | 817 | 37 | India |
| 30 | 21 | Journal of Personality And Social Psychology | 10 | 0.5 | 827 | 37 | USA |
| 31 | 21 | Journal of School Psychology | 10 | 0.5 | 837 | 37 | UK |
| 32 | 22 | Remaining 1196 titles were cited less than 10 times | 1396 | 63 | 2233 | 100 | |
| | | | 2233 | 100 | | | |

The above table shows that ranked list of core journals as reflected in the table.5. It is observed that researchers in education have cited a total of 2233 journal articles. The study finds that Indian Educational Review ranked 1st with 80 (3.6%) and Journal of Applied Psychology ranked 2ndwith 73(3.3%) are the top two journals. Journal of Educational Research with 62(2.8%) occupied 3rd place. Fourth place goes to Journal of Educational Psychology with 59(2.6%) and lastly 1196(63%) journals were cited in less than 10 time were grouped into single group and given into last rank.

**Table.6: Authorship productivity of journal citation**

| Sl. No | No of Author | No of Journal citations | % |
|---|---|---|---|
| 1 | Single Author | 987 | 44.2 |
| 2 | Two Authors | 800 | 35.83 |
| 3 | Three Authors | 362 | 16.21 |
| 4 | More than three Authors | 84 | 3.76 |
| | **Total** | **2233** | |

Table-.6examines the authorship productivity of journal and the study finds that there are 987 (44.2%) citations have single authorship. Followed by 800(35.83%) citation are on Two authors, three author sources are 362(16.21%) and more than three authors contributions are 84(3.76%).

**Table-.7 Subject wise distribution of education theses**

| Sl No | Subject of the Doctoral thesis | No of contribution | Percentage of No. of contribution |
|---|---|---|---|
| 1 | Foundation of Education | 11 | 32.35 |
| 2 | Educational Psychology | 10 | 29.41 |
| 3 | Teacher Education | 7 | 20.59 |
| 4 | Information and Communication Technology | 5 | 14.71 |
| 5 | Educational Administration | 1 | 2.94 |
| | Total | 34 | 100 |

It can be seen from the table 6.7 shows subject wise distribution of education theses. The majority of contribution were on the area of foundation of Education with 11 contributions (32.35%) followed by educational psychology with 10(29.41%), Teacher Education 7(20.59%), Information and Communication Technology with 5(14.71%).

## 6. Findings and conclusion

In the present study 2233 citations were analyzed from 34 Ph.D. theses in education. On the basis of the above study the following findings and conclusions drawn from the present study.

It is observed in the table 1 shows the highest number of theses was submitted in 2019 account of 8 (23.53%) theses. Followed by 5 (14.71%) Theses submitted in 2013, 4(11.76%) in 2014 and 2018 respectively and average number of citations received per thesis is 169.08

In the bibliographic forms indicated that the journals are the most cited sources with 2233(50.72%). Books are the second place accounting for 912(20.71%). Etc

In the ranked list of journals, that Indian Educational Review occupies the first place accounting for 80 (3.6%) of total journal citations followed by Journal of Applied Psychology with 73 (3.3%) citations.

The analysis of authorship pattern in education theses reveals that 987 (44.2%) citations were written by single authorship. Followed by multi author contribution is more with 1246(55.8%). It shows that collaborative research contribution is more compared to single author contribution.

In the bibliographic forms indicated that the journals are the most cited sources with 2233(50.72%). Books are the second place accounting for 912(20.71%). etc.

The majority of contribution were on the area of foundation of Education with 11 contributions (32.35%) followed by educational psychology with 10(29.41%), Teacher Education 7(20.59%), Information and Communication Technology with 5(14.71%).

## 7. Conclusion:

Citation analysis is one of the most popular Bibliometrics technique used in recent days for the identification of core documents in the subject field. This technique is useful for library users to identify the right information to the right reader at the right time. The ranking of journals can be used by librarians and researchers to select the journals of greater importance in a particular subject area.

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# Websites of Universities in Madhya Pradesh: A Webometric Study

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**Abstract**

*This study analyses WISER Ranking of websites of 24 State Government Universities in Madhya Pradesh on the basis of 4 wiser parameters viz Visibility(V), Size(S), Rich Files(R), and Google Scholar(Sc).The findings of the study show that* ***Devi Ahilya University, Indore*** *obtained 1st rank with 1.69 WISER value.*

**Key Word**: *Webometric, State Government University, Madhya Pradesh, WISER Ranking, Visibility, Size, Rich Files, Google Scholar.*

## 1. INTRODUCTION

Webometric analyses show nature, structure. Content features of websites as well as links structure to understand virtual highways and their interrelations. (BjorhebarnandIngwersen, 2001)[1]. Quantitative Studies of the web have been named as webometrics by Almind and Ingwersen ( 1997)[2], although the basic issue had been identified simultaneously by (Larson, 1996)[3].Thus webometric is a science to study user's behavior in exploiting web resources and to judge popularity of a web browser, URL address, Link structures, file formats. Webometric analysis leads ranking of websites of Universities by studying weakness and strength of their websites as well as provide direction for improvements of websites.

## 2. WISER

Web Indicators for Science, Technology and Innovation Research (WISER) is a ranking method used to know the visibility and connectivity of the Universities on the web. WISER ranking method has been used to evaluate websites of Universities in this study.

## 4. OBJECTIVES

- To examine critically the effectiveness and efficiency of the use of websites of State Government Universities of Madhya Pradesh.
- To calculate the WISER ranking of websites of State Government Universities of Madhya Pradesh.

## 5. SCOPE AND LIMITATIONS

This study covers the websites of 24 universities in Madhya Pradesh (List of Universitiesunder 12-B of the UGC Act, 1956 section 3 of UGC Act and section 2 (f) and 12 (B) of UGCAct)as on 31.12.2020.

## 6. METHODOLOGY

For WISER Ranking analysis, the four indicators namely Size (S), Visibility (V), Rich Files (R) and Google Scholar (Sc) were collected and have been given different weight to each indicator to calculate the rank.

The WISERR ank is calculated by using the following formula:

**WISER Rank= 4*Visibility +2*Size +1*Rich Files+1*Scholar**

## 7.DATA ANALYSIS

**Table 1** shows the calculation of visibility of Universities in Madhya Pradesh. It reveals that Devi Ahilya University, Indoresecured 1st rank with maximum 243222 in links. Rajiv Gandhi Proudyogiki Vishwavidyalaya, Bhopal and Rani Durgavati University, Jabalpur secured 2nd and 3rd rank with 92556 in links and 92259 in links respectively. Whereas there are 07 state Government Universities shared the last 13th rank because of their less number of visibility impact factor.

**Table-1**

**Calculation of Visibility of Universities in Madhya Pradesh**

| S. No. | Name of Universities | In links | Standardized value(V) | Standardized value(V)4* | Rank |
|---|---|---|---|---|---|
| **1.** | Devi Ahilya University, Indore | 243222 | 0.15 | 0.63 | 1 |
| **2.** | Rajiv Gandhi Proudyogiki Vishwavidyalaya, Bhopal | 92556 | 0.06 | 0.24 | 2 |
| **3.** | Rani Durgavati University, Jabalpur | 92259 | 0.05 | 0.23 | 3 |
| **4.** | Barkatullah University, Bhopal | 68969 | 0.04 | 0.17 | 4 |
| **5.** | Jiwaji University, Gwalior | 63561 | 0.04 | 0.16 | 5 |
| **6.** | MP Bhoj Open University, Bhopal | 33294 | 0.02 | 0.08 | 6 |
| **7.** | Makhanlal Chaturvedi National University of Journalism & Communication, Bhopal | 26859 | 0.01 | 0.06 | 7 |
| **8.** | Awdesh Pratap Singh University, Rewa | 22114 | 0.01 | 0.05 | 8 |
| **9.** | Jawaharlal Nehru Krishi Vishwavidyalaya, Jabalpur | 11052 | 0.00 | 0.02 | 9 |
| **10.** | Raja Mansingh Tomar Music & Arts University, Gwalior | 10528 | 0.00 | 0.02 | 10 |
| **11.** | MaharajaChhatrasalBundelkhandUniversity,Chhatarpur | 10364 | 0.00 | 0.02 | 11 |
| **12.** | Vikram University, Ujjain | 6218 | 0.00 | 0.01 | |
| **13.** | Mahatma Gandhi Chitrakoot Gramoday University, Chitrakoot | 5262 | 0.00 | 0.01 | |

| | | | | | |
|---|---|---|---|---|---|
| **14.** | Madhya Prades hMedical Science University, Jabalpur | 5152 | 0.00 | 0.01 | |
| **15.** | Atal Bihari Vajpayee Hindi Vishwavidyalaya, Bhopal | 5007 | 0.00 | 0.01 | 12 |
| **16.** | Rajmata Vijayaraje Scindia Krishi Vishwavidyalaya, Gwalior | 4969 | 0.00 | 0.01 | |
| **17.** | National Law University, Bhopal | 4741 | 0.00 | 0.01 | |
| **18.** | Maharshi Panini Sanskrit Evam Vedic Vishwavidyalaya, Ujjain | 2061 | 0.00 | 0.00 | |
| **19.** | Dr Bhimrao Ambedkar University of Social Science, Mhow | 1850 | 0.00 | 0.00 | |
| **20.** | Nanaji Deshmukh Pashu Chikitsa Vigyan University, Jabalpur | 1843 | 0.00 | 0.00 | |
| **21.** | Sanchi University of Buddhist –Indic Studies, Sanchi | 1588 | 0.00 | 0.00 | 13 |
| **22.** | Dharamshala National Law University, Jabalpur | 459 | 0.00 | 0.00 | |
| **23.** | Pt.S. N. Shukla University, Shahdol | 129 | 0.00 | 0.00 | 13 |
| **24.** | Chhindwara University, Chhindwara | 06 | 0.00 | 0.00 | |

**Table 2** reveals the calculation of size of Universities websites in Madhya Pradesh.

It has been observed that Chhindwara University, Chhindwara obtained 1st position and Rani Durgavati University, Jabalpur; Jiwaji University, Gwalior; Devi Ahilya University, Indore; MP Bhoj Open University, Bhopalranked 2nd, 3rd , 4th and 5th respectively according to their size value.
Whereas total 10 Universities shared10th position and ranked last according to their Size value.

**Table-2**

**Calculation of Size (s) of Universities Web sites in Madhya Pradesh**

| S.No | NameofUniversity | Google | Bing | Yahoo | Size | Standardized value(s) | Standardized value(s)2* | Rank |
|---|---|---|---|---|---|---|---|---|
| **1.** | Chhindwara University, Chhindwara | 128 | 0000 | 622000 | 622128 | 0.40 | 0.80 | 1 |
| **2.** | Rani Durgavati University, Jabalpur | 5170 | 18400 | 36500 | 60070 | 0.03 | 0.07 | |
| **3.** | Jiwaji University, Gwalior | 20100 | 10800 | 25700 | 56600 | 0.03 | 0.07 | 2 |
| **4.** | Devi Ahilya University, Indore | 10500 | 14200 | 14500 | 39200 | 0.02 | 0.05 | 3 |
| **5.** | MP Bhoj Open University, Bhopal | 4890 | 16900 | 12700 | 34490 | 0.02 | 0.04 | 4 |
| **6.** | Vikram University, Ujjain | 513 | 116000 | 10500 | 22613 | 0.01 | 0.02 | |
| **7.** | Raja Mansingh Tomar Music & Arts University, Gwalior | 804 | 7910 | 12200 | 20914 | 0.01 | 0.02 | |
| **8.** | National Law University, Bhopal | 368 | 7370 | 11300 | 19038 | 0.01 | 0.02 | 5 |

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| **9.** | Rajiv Gandhi Proudyogiki Vishwavidyalaya, Bhopal | 3290 | 756 | 8020 | 18870 | 0.01 | 0.02 | |
| **10.** | Makhanlal National University Journalism Communication, Bhopal | 3200 | 7060 | 7550 | 17810 | 0.01 | 0.02 | 5 |
| **11.** | Jawaharlal Nehru Krishi Vishwavidyalaya, Jabalpur | 4150 | 5730 | 5310 | 15190 | 0.00 | 0.01 | 6 |
| **12.** | Awdesh Pratap Singh University, Rewa | 557 | 9650 | 3750 | 13957 | 0.00 | 0.01 | |
| **13.** | Barkatullah University, Bhopal | 2470 | 3440 | 2680 | 8590 | 0.00 | 0.01 | |
| **14.** | Nanaji Deshmukh Pashu Chikitsa Vigyan University, Jabalpur | 1020 | 2970 | 2270 | 6260 | 0.00 | 0.00 | |
| **15.** | DrBhimrao Ambedkar University of SocialScience, Mhow | 650 | 3120 | 1490 | 5260 | 0.00 | 0.00 | 7 |
| **16.** | Madhya Pradesh Medical Science University, Jabalpur | 1020 | 4180 | 45 | 5245 | 0.00 | 0.00 | |
| **17.** | Pt.S.N.Shukla University, Shahdol | 430 | 3020 | 1560 | 5010 | 0.00 | 0.00 | |
| **18.** | Rajmata Vijayaraje | | | | | | | |

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | Scindia Krishi Vishwavidyalaya, Gwalior | 1360 | 1780 | 1760 | 4900 | 0.00 | 0.00 | |
| **19.** | Mahatma Gandhi Chitrakoot Gramoday University, Chitrakoot | 452 | 1880 | 2360 | 4612 | 0.00 | 0.00 | |
| **20.** | Maharshi Panini Sanskrit Evam Vedic Vishwavidyalaya ,Ujjain | 555 | 1600 | 1750 | 3905 | 0.00 | 0.00 | 7 |
| **21.** | Dharamshala National Law University, Jabalpur | 269 | 2450 | 1120 | 3839 | 0.00 | 0.00 | |
| **22.** | Sanchi University of Buddhist – Indic Studies, Sanchi | 476 | 1600 | 1530 | 3606 | 0.00 | 0.00 | |
| **23.** | Atal Bihari Vajpayee Hindi Vishwavidyalaya, Bhopal | 529 | 144 | 611 | 1284 | 0.00 | 0.00 | |
| **24.** | Maharaja Chhatrasal Bundelkhand University , Chhatarpur | 702 | 156 | 28 | 886 | 0.00 | 0.00 | |

**Table 3** presents the calculation of Rich files in Madhya Pradesh. It is revealed from the table that MP Bhoj Open University, Bhopal obtained 1st position with 178 rich files. Rajmata Scindia University, Gwaliorobtained 2nd position with 162 Rich files. Raja Mansingh Tomar Music and Arts
University, Gwalior and Awdhesh Pratap Singh University, Rewa shared 3rd position with 144 Rich files. Dr. Bhimrao Ambedkar University of Social Science, Mhow obtained 4th position with 138 rich files. Whereas Makhanlal Chaturvedi National University of Journalism & Communication, Bhopal rank in the last position with 19 rich files.

**Table-3**
**Calculations of Rich Files(s) of Universities in Madhya Pradesh**

| S. No | Nameof University | PDF | PPT | DOC | PS | Total | Standardized Value(R) | Rank |
|---|---|---|---|---|---|---|---|---|
| **1.** | MP Bhoj Openuniversity, Bhopal | 67 | 35 | 76 | 00 | 178 | 1 | 1 |
| **2.** | Rajmata Vijayaraje Scindia KrishiVishwa Vidyalaya, Gwalior | 88 | 01 | 73 | 00 | 162 | 0.91 | 2 |
| **3.** | Raja Mansingh Tomar Music &Arts University, Gwalior | 112 | 04 | 28 | 00 | 144 | 0.80 | 3 |
| **4.** | Awdesh PratapSingh University, Rewa | 100 | 19 | 25 | 00 | 144 | 0.80 | |
| **5.** | Dr.Bhimrao Ambedkar University of Social Science, Mhow | 79 | 22 | 37 | 00 | 138 | 0.77 | 4 |
| **6.** | Barkatullah University, Bhopal | 114 | 10 | 08 | 00 | 132 | 0.74 | 5 |
| **7.** | Maharaja Chhatrasal Bundelkhand University, Chhatarpur | 107 | 09 | 13 | 00 | 129 | 0.72 | 6 |
| **8.** | Jawaharlal Nehru | 87 | 12 | 25 | 00 | 124 | 0.69 | 7 |

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | Krishi Vishwavidyalaya, Jabalpur | | | | | | | |
| **9.** | Rajiv Gandhi Proudyogiki Vishwavidyalaya, Bhopal | 76 | 11 | 30 | 00 | 117 | 0.65 | 8 |
| **10.** | Vikram University, Ujjain | 85 | 06 | 02 | 00 | 93 | 0.52 | 9 |
| **11.** | National Law University,Bhopal | 50 | 05 | 33 | 00 | 88 | 0.49 | 10 |
| **12.** | Dharamshala National Law University, Jabalpur | 46 | 20 | 16 | 00 | 82 | 0.46 | 11 |
| **13.** | Rani Durgavati University, Jabalpur | 43 | 05 | 130 | 00 | 178 | 0.43 | 12 |
| **14.** | Sanchi University of Buddhist – Indic Studies, Sanchi | 62 | 08 | 04 | 00 | 74 | 0.41 | 13 |
| **15.** | Nanaji Deshmukh Pashu Chikitsa Vigyan Univ., Jabalpur | 47 | 14 | 11 | 00 | 72 | 0.40 | 14 |
| **16.** | Atal Bihari Vajpayee Hindi Vishwavidyalaya, Bhopal | 40 | 11 | 04 | 00 | 55 | 0.30 | 15 |
| **17.** | MahatmaGandhiChitrakootGramodayUniversity, Chitrakoot | 10 | 00 | 45 | 00 | 55 | 0.30 | |
| **18.** | Jiwaji University, Gwalior | 33 | 03 | 06 | 00 | 42 | 0.23 | 16 |
| **19.** | Devi Ahilya University, Indore | 21 | 17 | 03 | 00 | 41 | | |
| **20.** | Pt..Dwarka Prasad MishraIndian Institute of IT, Design & Manufacturing Jabalpur | 32 | 05 | 03 | 00 | 40 | 0.22 | 17 |

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| **21.** | Madhya Pradesh Medical Science University, Jabalpur | 30 | 02 | 05 | 00 | 37 | 0.20 | 18 |
| **22.** | Chhindwara University Chhindwara | 19 | 03 | 06 | 00 | 28 | 0.15 | 19 |
| **23.** | Maharshi Panini Sanskrit Evam Vedic Vishwavidyalaya, Ujjain | 13 | 08 | 00 | 00 | 21 | 0.11 | 20 |
| **24.** | Makhanlal Chaturvedi National University of Journalism & Communication, Bhopal | 05 | 05 | 09 | 00 | 19 | 0.10 | 21 |

**Table4** presents the calculation of Google scholar of Universities in Madhya Pradesh. It is observed that Devi Ahilya University, Indore secured 1st rank with 780 Google scholar output; MP Bhoj Open University, Bhopal secured 2nd rank with 38 Google scholar output. Jiwaji University, Gwalior and Rajiv Gandhi Proudyogiki Vishwavidyalaya, Bhopal obtained 3rd, and 4thpositionwith 23 and 15 Google scholar output.

**Table-4**
**Calculation of Google Scholar of Universities in Madhya Pradesh**

| S.No. | Name of University | Google Scholar | Standardized Value | Rank |
|---|---|---|---|---|
| **1.** | Devi Ahilya University, Indore | 780 | 0.78 | 1 |
| **2.** | MP Bhoj Open University, Bhopal | 38 | 0.03 | 2 |
| **3.** | Jiwaji University, Gwalior | 23 | 0.02 | 3 |

| | | | | |
|---|---|---|---|---|
| **4.** | Rajiv Gandhi Proudyogiki Vishwavidyalaya, Bhopal | 15 | 0.01 | 4 |
| **5.** | Makhanlal Chaturvedi National University of Journalism & Communication, Bhopal | 14 | 0.01 | 4 |
| **6.** | National Law University, Bhopal | 14 | 0.01 | |
| **7.** | Jawaharlal Nehru Krishi Vishwavidyalaya, Jabalpur | 07 | 0.00 | 5 |
| **8.** | Dr. Bhimrao Ambedkar University of Social Science, Mhow | 07 | 0.00 | |
| **9.** | Barkatullah University, Bhopal | 06 | 0.00 | |
| **10.** | Rajmata Vijayaraje Scindia Krishi Vishwa Vidyalaya , Gwalior | 06 | 0.00 | |
| **11.** | Rani Durgavat University, Jabalpur | 05 | 0.00 | |
| **12.** | Awdesh Pratap Singh University, Rewa | 03 | 0.00 | |
| **13.** | Vikram University, Ujjain | 01 | 0.00 | |
| **14.** | Nanaji DeshmukhPashu Chikitsa Vigyan University, Jabalpur | 01 | 0.00 | |
| **15.** | Madhya Pradesh Medical Science University, Jabalpur | 01 | 0.00 | |
| **16.** | Dharamshala National Law University, Jabalpur | 01 | 0.00 | |
| **17.** | Chhindwara University, Chhindwara | 00 | 0.00 | |
| **18.** | Pt. S.N. Shukla University, Shadol | 00 | 0.00 | |

| | | | | |
|---|---|---|---|---|
| **19.** | Maharaja Chhatrasal Bundelkhand University, Chhatarpur | 00 | 0.00 | 5 |
| **20.** | Maharshi Panini Sanskrit Evam Vedic Vishwavidyalaya, Ujjain | 00 | 0.00 | |
| **21.** | AtalBihari Vajpayee Hindi Vishwavidyalaya, Bhopal | 00 | 0.00 | |
| **22.** | Mahatma Gandhi Chitrakoot Gramoday University, Chitrakoot | 00 | 0.00 | |
| **23.** | Raja Mansingh Tomar Music & Arts University, Gwalior | 00 | 0.00 | |
| **24.** | Sanchi University of Buddhist – IndicStudies, Sanchi | 00 | 0.00 | |

**Table 5** depicts the wiser ranking of websites of Universities in Madhya Pradesh. It has been observed that Devi Ahilya University, Indore obtained 1st rank with 1.69WISER value followed by MP Bhoj Open University; Bhopal got 2nd rank with 1.15 WISER value. Chhindwara University, Chhindwara ranked 3rd with 0.95 WISER value. Rajmata Vijayaraje Scindia Krishi Vishwavidyalaya, Gwalior and Barkatullah University, Bhopal shared 4thpositionwith 0.92WISERvalue.

**Table 5**

**WISER Ranking of Universities in Madhya Pradesh**

| S.No | Name of University | 4* Rank V | 2* Rank S | 1* Rank Rich File | 1* Rank Google Scholar | WISER | Rank |
|---|---|---|---|---|---|---|---|
| **1.** | Devi Ahilya University, Indore | 0.63 | 0.05 | 0.23 | 0.78 | 1.69 | 1 |
| **2.** | MPBhoj Open University, Bhopal | 0.08 | 0.04 | 1 | 0.03 | 1.15 | 2 |

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| **3.** | Chhindwara University, Chhindwara | 0.00 | 0.80 | 0.15 | 0.00 | 0.95 | 3 |
| **4.** | Rajmata Vijayaraje Scindia Krishi Vishwavidyalaya, Gwalior | 0.01 | .00 | 0.91 | 0.00 | .092 | 4 |
| **5.** | Barkatullah University, Bhopal | 0.17 | 0.01 | 0.74 | 0.00 | 0.92 | 4 |
| **6.** | Rajiv Gandhi Proudyogiki Vishwavidyalaya, Bhopal | 0.24 | 0.02 | 0.65 | 0.01 | 0.92 | 4 |
| **7.** | Awdesh, PratapSingh University, Rewa | 0.05 | 0.01 | 0.80 | 0.0 | 0.86 | 5 |
| **8.** | Raja Mansingh TomarMusic & Arts University, Gwalior | 0.02 | 0.02 | 0.80 | 0.00 | 0.84 | 6 |
| **9.** | Dr. Bhimrao Ambedkar University of Social Science, Mhow | 0.00 | 0.00 | 0.77 | 0.00 | 0.77 | 7 |
| **10.** | Maharaja Chhatrasal Bundelkhand University, Chhatarpur | 0.02 | 0.00 | 0.72 | 0.00 | 0.74 | 8 |

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| **11.** | Rani Durgavati University, Jabalpur | 0.23 | 0.07 | 0.43 | 0.00 | 0.73 | |
| **12.** | Jawaharlal Nehru Krishi Vishwavidyalaya, Jabalpur | 0.02 | 0.01 | 0.69 | 0.00 | 0.72 | |
| **13.** | Vikram University, Ujjain | 0.01 | 0.02 | 0.52 | 0.00 | 0.55 | |
| **14.** | National Law University, Bhopal | 0.01 | 0.02 | 0.49 | 0.01 | 0.53 | |
| **15.** | Jiwaji University, Gwalior | 0.16 | 0.07 | 0.23 | 0.02 | 0.48 | |
| **16.** | Dharamshala National Law University, Jabalpur | 0.00 | 0.00 | 0.46 | 0.00 | 0.46 | |
| **17.** | Sanchi University of Buddhist-IndicStudies, Sanchi | 0.00 | 0.00 | 0.41 | 0.00 | 0.41 | |
| **18.** | NanajiDeshmukh PashuChikitsaVigyanUniversity, Jabalpur | 0.00 | 0.00 | 0.40 | 0.00 | 0.40 | |
| **19.** | Pt..S.N. Shukla University, Shahdol | 0.00 | 0.00 | 0.37 | 0.00 | 0.37 | |
| **20.** | Atal Bihari Vajpayee Hindi Vishwavidyalaya, Bhopal | 0.01 | 0.00 | 0.30 | 0.00 | 0.31 | |

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| **21.** | Mahatma Gandhi Chitrakoot Gramoday University, Chitrakoot | 0.01 | 0.00 | 0.30 | 0.00 | 0.31 | |
| **22.** | Madhya Pradesh Medical Science University, Jabalpur | 0.01 | 0.00 | 0.20 | 0.00 | 0.21 | |
| **23.** | Makhanlal Chaturvedi National University of Journalism & Communication, Bhopal | 0.06 | 0.02 | 0.10 | 0.01 | 0.19 | |
| **24.** | Maharshi Panini Sanskrit Evam Vedic Vishwavidyalaya, Ujjain | 0.00 | 0.00 | 0.11 | 0.00 | 0.11 | |

## 8. RECOMMENDATIONS

- The Universities which have the small numbers of web pages may increase their web pages so that the surfer an get access to their desired information.
- Websites may host maximum numbers of publically accessible rich files to help the users to utilize their information.
- The Universities may also try to provide information in different formats for the ease of users.
- Universities can yield better results in ranking by keeping their websites updated.

## 9. CONCLUSION

The growing use of World Wide Web in the libraries and advent of websites revolutionized the process of Universities in term of publicity and dissemination of information regarding their setup and services, facilities, staff, research activities, courses, fees, upcoming events, latest updates and so on. A updated University web

sites can disseminate a wide range of information to their surfers and satisfy Laws of Library Science.

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# Authorship Pattern and Collaborative Research in Indian Journal of Mathematics

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**Abstract**

*The present study was carried out on the total number of 1,739 citations appended to ninety eight articles published in Indian Journal of Mathematics during 2015 to 2018. The paper highlights the year-wise distribution of articles; average number of citations per article; bibliographic form-wise distribution of citations; authorship pattern for journal articles and books; average number of authors per citation in journal articles and degree of collaboration.*

**Key Words:** *Bibliometrics, Indian Journal of Mathematics and Authorship Pattern*

## Introduction:

The terms Librametrics, Bibliometrics, Informetrics and Scientometrics are analogous, or rather synonymous, in nature and their major scope and application involves different facets of library and information science. All these terms are directly related to measure knowledge, which in turn depends exclusively on the generation of new ideas developed through well built information communication channels, whose primary aim is to ensure rapid collection and distribution of the most important information for the generators of knowledge [1].

## Definition of Bibliometrics:

Alan Pritchard defined Bibliometrics as the "application of mathematics and statistical methods to books and other media of communication." This means, bibliometrics is a kind of measuring technique by which inter connected aspects of written communication can be quantified [2].

## Indian Journal of Mathematics:

The Allahabad Mathematical Society (AMS) was founded in the year 1958; it is a non-profit scientific organization for promoting the cause of advanced study and research in various branches of mathematics. *Indian Journal of Mathematics* (IJM) was published by AMS. It publishes original research papers in different branches of mathematics such as pure mathematics, applied mathematics and mathematical statistics.

**Objectives:** The objectives of the present study are:

1. To find out the various sources of literature used by researchers in mathematics;
2. To study the nature of authorship pattern in Journal literature;
3. To study the nature of the authorship pattern in books; and
4. To study collaborative research in 'Indian Journal of Mathematics'.

## Methodology:

The analysis has been carried out on the total number of 1,739 citations appended to ninety eight articles published during 2015 to 2018 in the Indian Journal of Mathematics. This period comprises volumes 57 to 60 (12 number of issues). The different sources of information used by mathematicians in the field of mathematics are studied by analysing the citations according to their bibliographic form. Some citations were given merely to the abstracts in a secondary periodical. These have been grouped under the term *'Unidentified'* category and were not taken into account in the further study.

Journal and book citations have been analysed to study the nature of single and multiple authorship patterns. The data was grouped into five year intervals and the number of authors was converted to percentages for each interval and for the total period. Chi-square Test was applied to study the trends in authorship pattern. Further, the citations were grouped into eight groups with ten years as the interval with the exception of the first group, which represents all the citations up to 1950. Citations with single author, multi authors for each of the intervals were computed. The significant relationship between single author and multi authors has been established by applying, Chi-square Test using the Excel software [8].

The average number of authors per paper (author/article ratio) was computed by adding up the number of authors and dividing this by the number of

papers for each interval and for the overall period. The degree of collaboration was calculated using the formula given by Subramanyam (1983) [9].

$$C = \frac{N_m}{N_m + N_s}$$

Where C = Degree of collaboration in a discipline

Nm = Number of multi-authored research papers

Ns = Number of single authored research papers

**Data Analysis:**

The distribution of articles among different volumes of 'Indian Journal of Mathematics' is presented in Table - 1.

**Table - 1: Year-Wise Distribution of Articles**

| Year | Volume No. | No. of Articles | No. of Citations | Average No. of Citations per Article |
|---|---|---|---|---|
| 2015 | 57 | 25 | 391 | 15.64 |
| 2016 | 58 | 21 | 313 | 14.90 |
| 2017 | 59 | 26 | 460 | 17.69 |
| 2018 | 60 | 26 | 575 | 22.12 |
| Total | | 98 | 1,739 | 17.74 |

It is evident from the Table - 1 that a total number of ninety eight articles were published in all the four volumes of IJM for the period 2015 to 2018. Volumes 59 and 60, published during 2017 and 2018 account for maximum number (26) of articles followed by volume 57 with 25 articles and volume 58 with 21 articles. Volume 60 accounts for highest number of citations with an average number of 22.12 citations per article followed by volume 59 (17.69%), volume 57 (15.64%) and volume 58 (14.90%).

**Bibliographic Form-Wise Distribution of Citations:**

The distribution of citations among different bibliographic forms in 'Indian Journal of Mathematics' is presented in Table- 2 and represented graphically in Figure- 1.

**Table - 2: Bibliographic Form-Wise Distribution of Citations**

| Sl. No. | Bibliographic Form | No. of Citations | Percentage | Cumulative Number | Cumulative Percentage |
|---|---|---|---|---|---|
| 1 | Journals | 1,454 | 83.61 | 1,454 | 83.61 |
| 2 | Books | 230 | 13.23 | 1,684 | 96.84 |
| 3 | Conference Papers | 15 | 0.86 | 1,699 | 97.70 |
| 4 | Reference Books | 13 | 0.75 | 1,712 | 98.45 |
| 5 | Dissertations | 4 | 0.23 | 1,716 | 98.68 |
| 6 | Reports | 3 | 0.17 | 1,719 | 98.85 |
| 7 | Newspapers | 1 | 0.06 | 1,720 | 98.91 |
| 8 | Unidentified | 19 | 1.09 | 1,739 | 100.00 |

It is observed from the table -2 that the journals contributed the highest number of citations, accounting for 83.61 per cent of the total citations. This indicates that journals are the most preferred source of information used by researchers in mathematics. Books are the second most cited source accounting for 13.23 per cent of the total citations. Similar results were obtained by Vimala (1997) for biological sciences (journals 85.34% and books 9.89%) [10], Krishna Reddy and Aruna Prasad Reddy (2014) for mathematics (journals 83.19% and books 9.49) [11]. Conference papers account for 0.86 per cent of the total citations followed by reference books (0.75%), dissertations (0.23%), reports (0.17%), newspapers (0.06%) and the last category, *unidentified*, accounts for 1.09 per cent of the total citations.

## Authorship Pattern and Collaborative Research:

Research collaboration is deep form of interaction fostering effective communication as well as sharing of competence and other resources in search of new knowledge. Multiple authorship is a well-recognized feature of the modern science and there has been a consistent trend towards increased collaboration in all disciplines of science and technology. Multiple authorship has become more common in the present century. Authorship pattern, average number of authors per citation i.e. (author/article ratio) and the degree of collaboration in 'Indian Journal of Mathematics' are presented in the Tables 3 to 6.

## Table - 3: Authorship Pattern in Journal Citations

| Reference Period | Single Author | Multiple Authors | | | | Total Citations |
|---|---|---|---|---|---|---|
| | | Two | Three | Four & Above | Total | |
| Till-1950 | 46 (86.79) | 7 (13.21) | - | - | 7 (13.21) | 53 (100) |
| 1951-1955 | 20 (100) | - | - | - | - | 20 (100) |
| 1956-1960 | 12 (100) | - | - | - | - | 12 (100) |
| 1961-1965 | 10 (76.92) | 2 (15.38) | 1 (7.69) | - | 3 (23.08) | 13 (100) |
| 1966-1970 | 27 (64.29) | 13 (30.95) | 2 (4.76) | - | 15 (35.71) | 42 (100) |
| 1971-1975 | 47 (77.05) | 13 (21.31) | 1 (1.64) | - | 14 (22.95) | 61 (100) |
| 1976-1980 | 31 (63.27) | 18 (36.73) | - | - | 18 (36.73) | 49 (100) |
| 1981-1985 | 20 (30.77) | 31 (47.69) | 13 (20.00) | 1 (1.54) | 45 (69.23) | 65 (100) |
| 1986-1990 | 15 (33.33) | 22 (48.89) | 8 (17.78) | - | 30 (66.67) | 45 (100) |
| 1991-1995 | 31 (42.47) | 23 (31.51) | 17 (23.29) | 2 (2.74) | 42 (57.53) | 73 (100) |
| 1996-2000 | 34 (32.08) | 63 (59.43) | 5 (4.72) | 4 (3.77) | 72 (67.92) | 106 (100) |
| 2001-2005 | 55 (35.71) | 68 (44.16) | 22 (14.29) | 9 (5.84) | 99 (64.29) | 154 (100) |
| 2006-2010 | 82 (26.03) | 140 (44.44) | 79 (25.08) | 14 (4.44) | 233 (73.97) | 315 (100) |
| 2011-2015 | 94 (26.04) | 158 (43.77) | 75 (20.78) | 34 (9.42) | 267 (73.96) | 361 (100) |
| 2016-2018 | 22 (25.88) | 34 (40.00) | 26 (30.59) | 3 (3.53) | 63 (74.12) | 85 (100) |
| Total | 546 (37.55) | 592 (40.72) | 249 (17.13) | 67 (4.61) | 908 (62.45) | 1,454 (100) |

Table - 3 presents the authorship pattern of journal citations in '*Indian Journal of Mathematics*'. Papers with two authors are high in number with 40.72 per cent of the total journal citations followed by single authored papers (37.55%), papers with three authors (17.13%) and papers with four and more than four authors (4.61%). There is an irregular declining trend in single authored papers from 100 per cent (1951-1955) to25.88 per cent(2016-2018). Similar results were obtained by Rahman and Bhattacharya (2011) in mathematics (two authors 42%; single author 31.41%; three authors 18.38%) [12].

**Table - 4: Authorship Pattern in Book Citations**

| Reference Period | Single Author | Multiple Authors | | | | Total Citations |
|---|---|---|---|---|---|---|
| | | Two | Three | Four & Above | Total | |
| Till-1950 | 9 (100) | - | - | - | - | 9 (100) |
| 1951-1955 | 2 (66.67) | 1 (33.33) | - | - | 1 (33.33) | 3 (100) |
| 1956-1960 | 3 (100) | - | - | - | - | 3 (100) |
| 1961-1965 | 12 (70.59) | 5 (29.41) | - | - | 5 (29.41) | 17 (100) |
| 1966-1970 | 7 (63.64) | 3 (27.27) | - | 1 (9.09) | 4 (36.36) | 11 (100) |
| 1971-1975 | 9 (50.00) | 8 (44.44) | - | 1 (5.56) | 9 (50.00) | 18 (100) |
| 1976-1980 | 15 (55.56) | 9 (33.33) | 3 (11.11) | - | 12 (44.44) | 27 (100) |
| 1981-1985 | 12 (70.59) | 3 (17.65) | 2 (11.76) | - | 5 (29.41) | 17 (100) |
| 1986-1990 | 16 (88.89) | 2 (11.11) | - | - | 2 (11.11) | 18 (100) |
| 1991-1995 | 6 (42.86) | 6 (42.86) | 2 (14.29) | - | 8 (57.14) | 14 (100) |
| 1996-2000 | 6 (28.57) | 11 (52.38) | 4 (19.05) | - | 15 (71.43) | 21 (100) |
| 2001-2005 | 11 (47.83) | 9 (39.13) | 2 (8.70) | 1 (4.35) | 12 (52.17) | 23 (100) |

| | | | | | | |
|---|---|---|---|---|---|---|
| 2006-2010 | 7 (28.00) | 8 (32.00) | 9 (36.00) | 1 (4.00) | 18 (72.00) | 25 (100) |
| 2011-2015 | 8 (38.10) | 8 (38.10) | 5 (23.81) | - | 13 (61.90) | 21 (100) |
| 2016-2018 | - | 3 (100) | - | - | 3 (100) | 3 (100) |
| Total | 123 (53.48) | 76 (33.04) | 27 (11.74) | 4 (1.74) | 107 (46.52) | 230 (100) |

The authorship pattern of book citations in *Indian Journal of Mathematics* is presented in Table - 4. It is observed from the above table that books with single author are the highest in number in '*Indian Journal of Mathematics'*, accounting for 53.48 per cent of the total citations to books. Books with two authors occupy second place with 33.04 per cent followed by books with three authors (11.74%), books with four and more than four authors (1.74%). Thus, multi-authored books account for 46.52 per cent of the total cited books. The citations given to the single authored and multi-authored books during the period 1951-1955 to 2016-2018 has not shown any regular pattern.

For the purpose of statistical analysis, the distribution of citations in 'Indian Journal of Mathematics' is grouped into ten year intervals (reference period) according to the number of authors and is presented in Tables 3 and 4. It is observed from the tables that there is a temporal change in the authorship over the recent seven decades covered in this study. In order to verify whether this trend has occurred by chance or whether there is a significant relationship between single author and multi authors, the Chi-square test has been applied. The findings are that there is a statistically significant relationship between single author and multi authors, as evidenced by Chi-square values with 7 degree of freedom at 0.05 level.

**Table - 5: Authorship Pattern in Journal Citations-10 year Intervals**

| Reference Period | Single Author | Multi Authors | Total |
|---|---|---|---|
| Till-1950 | 46 (86.79) | 7 (13.21) | 53 (100) |
| 1951-1960 | 32 (100) | - | 32 (100) |
| 1961-1970 | 37 (67.27) | 18 (32.73) | 55 (100) |
| 1971-1980 | 78 (70.91) | 32 (29.09) | 110 (100) |
| 1981-1990 | 35 (31.82) | 75 (68.18) | 110 (100) |

| | | | |
|---|---|---|---|
| 1991-2000 | 65 (36.31) | 114 (63.69) | 179 (100) |
| 2001-2010 | 137 (29.21) | 332 (70.79) | 469 (100) |
| 2011-2018 | 116 (26.01) | 330 (73.99) | 446 (100) |

**Table - 6: Authorship Pattern in Books Citations-10 year Intervals**

| Reference Period | Single Author | Multi Authors | Total |
|---|---|---|---|
| Till-1950 | 9 (100) | - | 9 (100) |
| 1951-1960 | 5 (83.33) | 1 (16.67) | 6 (100) |
| 1961-1970 | 19 (67.86) | 9 (32.14) | 28 (100) |
| 1971-1980 | 24 (53.33) | 21 (46.67) | 45 (100) |
| 1981-1990 | 28 (80.00) | 7 (20.00) | 35 (100) |
| 1991-2000 | 12 (34.29) | 23 (65.71) | 35 (100) |
| 2001-2010 | 18 (37.50) | 30 (62.50) | 48 (100) |
| 2011-2018 | 8 (33.33) | 16 (66.67) | 24 (100) |

| Variables | Chi-square Value | Table Value | df | Results |
|---|---|---|---|---|
| Single Vs Multi Authors - Journals | 221.84 | 14.07 | 7 | Sig. at 0.05 level |
| Single Vs Multi Authors -Books | 25.67 | 14.07 | 7 | Sig. at 0.05 level |

The authorship pattern in journal and book citations in '*Indian Journal of Mathematics*' is represented graphically in figures 2 and 3 respectively. The authorship pattern in journal and book citations are shown that the single authored papers are found to decline, while papers with multi authors were increased over the time period. The average number of authors per citation ratios fluctuate over the period.

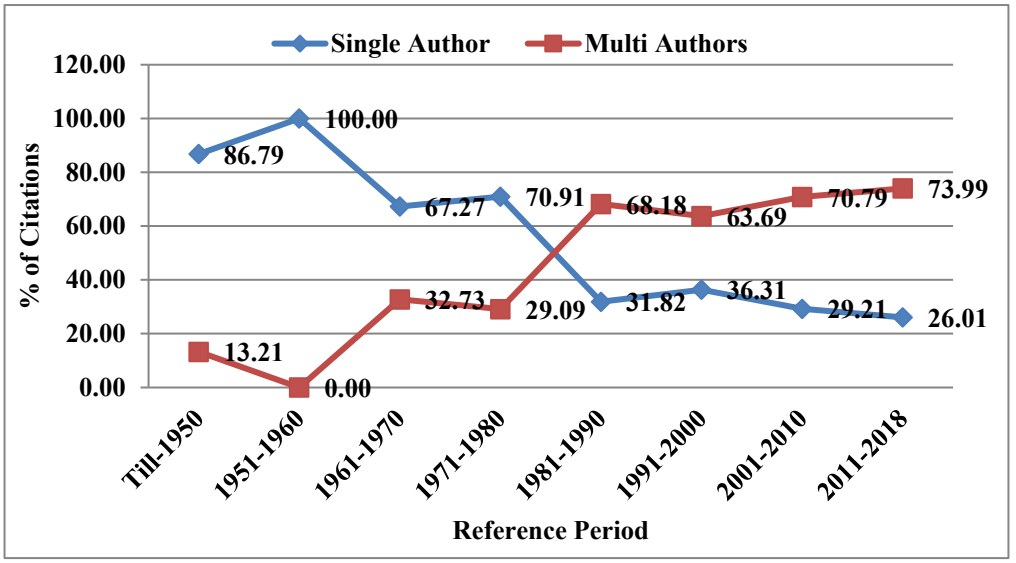



**Figure - 2: Authorship Pattern in Journal Citations**

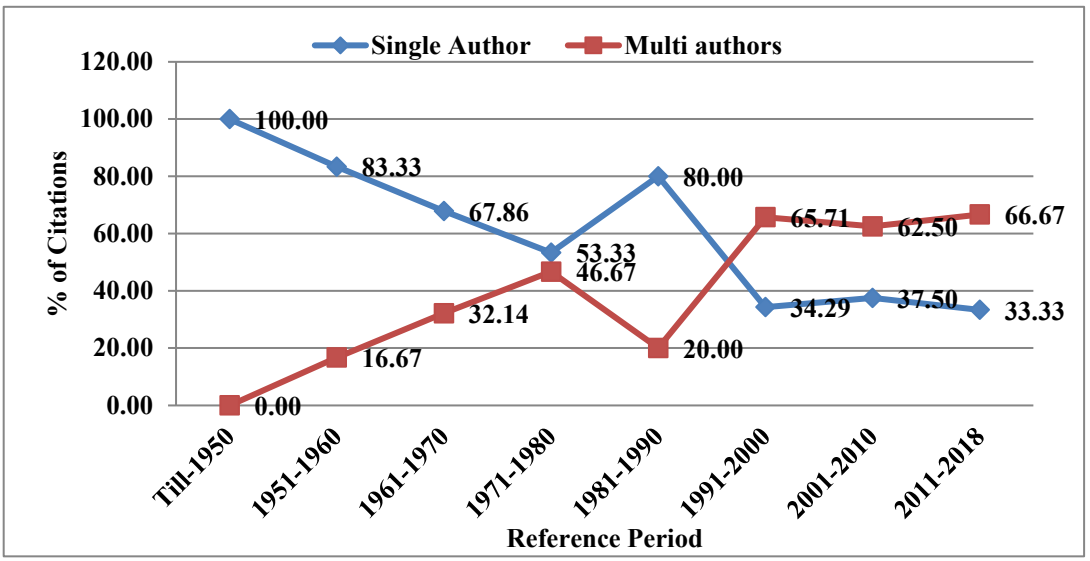



**Figure - 3: Authorship Pattern in Book Citations**

## Average Number of Authors per Citation and Degree of Collaboration:

The average number of authors per citation denotes an opinion of the extent of collaboration in a discipline. Table -7represents the average number of authors per citation in journal articles and degree of collaboration.

**Table - 7: Average Number of Authors per Citationand Degree of Collaboration**

| Reference Period | Total No. of Citations | Total No. of Authors | Average No. of Authors per Citation | Degree of Collaboration |
|---|---|---|---|---|
| Till-1950 | 53 | 60 | 1.13 | 0.13 |
| 1951-1955 | 20 | 20 | 1.00 | 0.00 |
| 1956-1960 | 12 | 12 | 1.00 | 0.00 |
| 1961-1965 | 13 | 17 | 1.31 | 0.23 |
| 1966-1970 | 42 | 59 | 1.40 | 0.36 |
| 1971-1975 | 61 | 76 | 1.25 | 0.23 |
| 1976-1980 | 49 | 67 | 1.37 | 0.37 |
| 1981-1985 | 65 | 125 | 1.92 | 0.69 |
| 1986-1990 | 45 | 83 | 1.84 | 0.67 |
| 1991-1995 | 73 | 136 | 1.86 | 0.58 |
| 1996-2000 | 106 | 191 | 1.80 | 0.68 |
| 2001-2005 | 154 | 294 | 1.91 | 0.64 |
| 2006-2010 | 315 | 657 | 2.09 | 0.74 |
| 2011-2015 | 361 | 774 | 2.14 | 0.74 |
| 2016-2018 | 85 | 180 | 2.12 | 0.74 |
| Total | 1,454 | 2,751 | 1.89 | 0.62 |

The average number of authors per citation ratios fluctuate over the period. The highest author/article ratio is 2.14 during the period 2011-2015 and the average number of author per citation for the period under study is 1.89. The study carried out by Krishna Reddy (2015) reveals that the average number of authors per citation in mathematics is 1.95 [13]. The average value of degree of collaboration in *'Indian Journal of Mathematics'*is 0.62.

## Conclusion

The present study was carried out on the total number of 1,739 citations appended to *'Indian Journal of Mathematics'* published during 2015 to 2018. The journals contributed the highest number of citations, accounting for 83.61 per cent of the total citations followed by Books (13.23%). This indicates that researchers in mathematics preferred journal literature as the primary source of information in pursuit of their research. Papers with two authors are high in number with 40.72 per cent of the total journal citations followed by single authored papers (37.55%). And single author are the highest in number in book citations accounting for 53.48 per cent of the total citations followed by two authors (33.04%). The average number of authors per citation ratios fluctuate over the period. The average number of authors per citation for the period under study is 1.89 and the average value of degree of collaboration is 0.62.

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# Citation analysis of Ph.D. Theses in management submitted to Sri Krishnadevara University, Anatapur, Andhra pradesh

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**Abstract**

*The present research paper attempts a citation analysis of Ph. D theses in Management submitted to Sri Krishnadevaraya University, Anatapur during the years 2001-2017. The analysis brings significant findings related to various pertinent aspects like different bibliographic forms, authorship pattern, chronological citations of books and journals, degree of collaboration and ranks list of cited journals. Finally conclusions have been drawn from each aspect of analysis.*

**Keywords**: *Citation analysis, Ph.D. Theses, Management, Sri Venkateswara University*

## 1. Introduction

Citation Analysis is one of the most effective techniques for analysing the many properties of resources. Today, most libraries are dealing with issues such as rising journal subscription costs, dwindling library budgets, and a shortage of room for library holdings, among other things, resulting in a slew of user surveys being conducted. Citation analysis can be used in two different ways. Citations are used to find out various features of literature use, such as type of documents, languages, age, country of origin, subject distribution, highly cited authors, Journals, citation rate, authorship pattern, and so on. The other type of study is useful to derive the research productivity in a field of study, and it is suitable for librarians.

20th century documentalists applied mathematical and statistical techniques to bibliographical units. In the field of library and information science bibliometric study is the new branch of knowledge. In this, citation analysis is one of the areas to identity core journals and books and for knowing the characteristic features of the disciplines such as authorship pattern, scatter of literature in different bibliographic forms, and in different subjects etc. Gross and Gross (1927) used for the first time this citation analysis as a tool for identifying the core journals in a subject based on counting and citation given at the end of each article from a group of a primary journals. Afterwards, a number of such studies were carried out on citations in dissertation / theses, books, primary journals and reviewing journals.

## 2. Objectives

The specific objectives of the present study

1. To know the various information sources consulted by the researchers in Management;
2. To observe the nature of the authorship pattern in the cited literature of Management;
3. To find out the range of publication dates;
4. To examine the degree of collaboration to the authorship pattern for books and journals in management;
5. To examine the core journals of management; and
6. To examine the applicability of Bradford's law of scattering to the pattern of journals used by the researcher.

## 3. Hypotheses

The following hypotheses have been formulated for the present study:

1. Journals and books are the most common cited source in the field of management.
2. All the researchers prefer the latest books and journals.
3. Most of the journals used have single author and most of the books also used have single author in the field of management.

## 4. Scope and Methodology

The present data was collected from 40 Ph.D theses in Management. These theses were submitted to Sri Krishnadevaraya University, Anatapur, Andhra Pradesh, India, during the years 2001-2017. There are 4613 citations appended in these theses. The average number citations per theses is nearly 115. All these citations are entered in MS-Excel work sheet as they are cited in the theses. They are analyzed according to the objectives as stated above.

## 5. Analysis of data

5.1 Bibliographic forms

Table 1 shows the distribution of cited literature in different bibliographic forms.

**Table 1: distribution of cited literature in different bibliographic forms**

| Sl. No | Bibliographic forms | No. of Citations | Percentage |
|---|---|---|---|
| 1 | Journals | 1563 | 33.88 |
| 2 | Books | 1593 | 34.53 |
| 3 | Conference proceedings/ Seminars/ symposiums etc. | 230 | 4.99 |
| 4 | Theses/ Dissertations | 124 | 2.68 |
| 5 | Reports | 386 | 8.37 |
| 6 | Websites | 405 | 8.78 |
| 7 | Monographs, News papers,Unidentified ,Meetings | 312 | 6.77 |
| | **Total** | **4613** | **100** |

The literature in any discipline is published in different bibliographic forms such as books, journals, theses/dissertations, reports, monographs, newspapers, websites, conference proceeding etc.

Table 1 shows the distribution of citations among different bibliographic forms in Management. It is evident from the table that the Books contributed to the highest number of citations accounting for 34.53 per cent of total citations. Journals are the second highest groups accounting for 33.88 per cent of the total citations. Hence, Books and Journals both appear to be the most preferred source of information for the research scholars in Management. It can be conclude that research scholars in Management use mostly Journals and Books for their research work.

### 5.2 Authorship Pattern of books and journals

The distribution of citations according to the number of authors in books and journals is Shown in Table 2.

**Table 2**Distribution of citations according to the number of authors in books and journals

| Sl. No | No. of authors | No. of Citations | Percentage |
|---|---|---|---|
| 1 | Single authors | 1990 | 63.05 |
| 2 | Double authors | 820 | 25.98 |
| 3 | Three authors | 188 | 5.96 |
| 4 | More than Three authors | 118 | 3.74 |
| 5 | Not Mentioned author name | 40 | 1.27 |
| | **Total** | **3156** | **100** |

It is evident from Table 2 that the single authors contribute 63.05 per cent of the total citations in books and journals. Following to, the double authors contribute 25.98 per cent of citations. Three authors (5.96%), more than three authors (3.74%), not mentioned author name (1.27%) contribute to the reaming citations. Majority of the users used single author citations in these regard.

### 5.3 Authorship pattern of Journals

The distribution of citations of journals in Management according to the number of authors is shown in Table 3.

**Table 3**
**Distribution of citations of journals according to the number of authors**

| Sl. No | No. of authors | No. of Citations | Percentage |
|---|---|---|---|
| 1 | Single authors | 920 | 58.86 |
| 2 | Double authors | 430 | 27.51 |
| 3 | Three authors | 123 | 7.87 |
| 4 | More than Three authors | 70 | 4.48 |
| 5 | Not Mentioned author name | 20 | 1.28 |
| | **Total** | **1563** | **100** |

It is evident from Table 3 that the most of the citations in journals (58.86%) have Single authors. Followed by, double authors (27.51%) of citations. The remaining citations are contributed by three (7.87%) and more than three (4.48%), not mentioned author name (1.28%) authors. Hence, it can be inferred from the data most of the authors in Management are writing journal articles in Single Author.

### 5.4 Authorship pattern of Books

The distribution of citations of books in Civil Engineering according to the number of authors is presented is Table 4.

**Table 4Distribution of citations of books according to the number of authors**

| Sl. No | No. of authors | No. of Citations | Percentage |
|---|---|---|---|
| 1 | Single authors | 1070 | 67.17 |
| 2 | Double authors | 390 | 24.48 |
| 3 | Three authors | 65 | 4.08 |
| 4 | More than Three authors | 48 | 3.01 |
| 5 | Not Mentioned author name | 20 | 1.26 |
| | **Total** | **1593** | **100** |

It is evident from Table 3 that the most of the citations in books (67.17%) have Single authors. Followed by, double authors (24.48%) of citations. The remaining citations are contributed by three (4.08%) and more than three (3.01%), not mentioned author name (1.26%) authors. Hence, it can be inferred from the data most of the authors in Management are writing books articles in single author.

### 5.5 Chronological distribution cited books and journals

The distribution of books and journals cited by Management researchers according to the year of publication is shown in Table 5.

**Table 5Distribution of citations of books and journals according to the year of publication**

| Sl. No | Year of Publishing | No. of Citations | Percentage |
|---|---|---|---|
| 1 | Before 1950 | 50 | 1.58 |
| 2 | 1951 -1960 | 100 | 3.17 |
| 3 | 1961 - 1970 | 232 | 7.35 |
| 4 | 1971 - 1980 | 385 | 12.20 |
| 5 | 1981 - 1990 | 602 | 19.07 |
| 6 | 1991 - 2000 | 1020 | 32.32 |
| 7 | 2001 - 2010 | 740 | 23.45 |
| 8 | 2011 above | 18 | 0.57 |
| 9 | Not mentioned | 9 | 0.29 |
| | **Total** | **3156** | **100** |

It is evident from Table 5 that most of the citations (32.32%) are used by the researchers were published during the period of 1991 – 2000. It is also evident from the same that (23.45%) used citations were published during the period of 2001 – 2010. It is obvious from the table that 19.07 per cent of used books and journals were published during the period of 1981--1990. Hence, it can be concluded that more than three by fourth of the books and journals cited were published between 1981 and 2010. This clearly points out that Management researchers are more inclined towards recent and latest editions of books and journals.

### 5.6 Degree of collaboration to authorship pattern

Degree of collaboration according to the number of authors in books and journals is Shown in Table 6. The degree of collaboration was calculated using the formula given by Subramanyam (1983).

$$C = \frac{N_m}{N_m + N_s}$$

Where C = Degree of collaboration in a discipline
Nm = Number of multi-authored research papers
Ns = Number of single authored research papers

**Table -5. 6Degree of Collaboration to authorship Pattern**

| Bibliographic Forms | Single author No. of Citations | Multiauthor No. of Citations | Total No. of Citations | Degree of collaboration |
|---|---|---|---|---|
| Books | 1070 | 1187 | 2257 | 0.53 |
| Journals | 920 | 1579 | 2499 | 0.63 |
| **Total** | 1990 | 2766 | 4756 | |

Table 5.6 shows degree of collaboration to authorship pattern for books and journals in Management. Journals collaborate 0.63 followed by books 0.53

### 5.7 Rank list of Journals

The rank list of cited journals is shown in Table 7.

## Rank List of Cited journals

| Sl. No | Rank | Name of the Journal | Citations | | Cumulative | |
|---|---|---|---|---|---|---|
| | | | No | % | No | % |
| 1 | 1 | Economic and political Weekly | 51 | 3.26 | 51 | 3.26 |
| 2 | 2 | Indian journal of marketing | 46 | 2.94 | 97 | 6.20 |
| 3 | 3 | Harvard business review | 38 | 2.43 | 135 | 8.63 |
| 4 | 4 | Journal of consumer research | 36 | 2.30 | 171 | 10.93 |
| 5 | 4 | Journal of marketing research | 36 | 2.30 | 207 | 13.23 |
| 6 | 5 | IEEE transactions on engineering management | 32 | 2.05 | 239 | 15.28 |
| 7 | 6 | Business standard | 28 | 1.79 | 267 | 17.07 |
| 8 | 6 | Reserve bank of India bulletin | 28 | 1.79 | 295 | 18.86 |
| 9 | 7 | The economic times | 25 | 1.60 | 320 | 20.46 |
| 10 | 8 | State bank of India bulletin | 23 | 1.47 | 343 | 21.93 |
| 11 | 9 | Indian journal of agriculture marketing | 22 | 1.41 | 365 | 23.34 |
| 12 | 10 | Journal of transport management | 21 | 1.34 | 386 | 24.68 |
| 13 | 11 | Vikalpa | 19 | 1.22 | 405 | 25.90 |
| 14 | 11 | Business world | 19 | 1.22 | 424 | 27.12 |
| 15 | 11 | Business India | 19 | 1.22 | 443 | 28.34 |
| 16 | 12 | Total quality management magazine | 18 | 1.15 | 461 | 29.49 |
| 17 | 12 | Indian journal of agriculture economics | 18 | 1.15 | 479 | 30.64 |
| 18 | 12 | Management science | 18 | 1.15 | 497 | 31.79 |
| 19 | 13 | Indian management | 17 | 1.09 | 514 | 32.88 |
| 20 | 13 | Journal of marketing | 17 | 1.09 | 531 | 33.97 |
| 21 | 13 | Journal of services research | 17 | 1.09 | 548 | 35.06 |
| 22 | 13 | Chartered secretary | 17 | 1.09 | 565 | 36.15 |
| 23 | 14 | The journal of risk and insurance | 16 | 1.02 | 581 | 37.17 |
| 24 | 14 | The management accountant | 16 | 1.02 | 597 | 38.19 |
| 25 | 14 | IBA bulletin | 16 | 1.02 | 613 | 39.21 |
| 26 | 15 | Indian journal of industrial relations | 14 | 0.90 | 627 | 40.11 |
| 27 | 15 | Business today | 14 | 0.90 | 641 | 41.01 |
| 28 | 15 | Research technology management | 14 | 0.90 | 655 | 41.91 |
| 29 | 15 | Marketing science | 14 | 0.90 | 669 | 42.81 |

| | | | | | | |
|---|---|---|---|---|---|---|
| 30 | 16 | Kurukshetra | 12 | 0.77 | 681 | 43.58 |
| 31 | 16 | Agriculture marketing | 12 | 0.77 | 693 | 44.35 |
| 32 | 17 | Indian journal of technical education | 11 | 0.70 | 704 | 45.05 |
| 33 | 18 | Yogana | 10 | 0.64 | 714 | 45.69 |
| 34 | 18 | Journal of academy of marketing science | 10 | 0.64 | 724 | 46.33 |
| 35 | 19 | Quality progress | 9 | 0.57 | 733 | 46.90 |
| 36 | 19 | Journal of universal computer science | 9 | 0.57 | 742 | 47.47 |
| 37 | 20 | Finance India | 8 | 0.51 | 750 | 47.98 |
| 38 | 20 | Human relations | 8 | 0.51 | 758 | 48.49 |
| 39 | 20 | Econometrica | 8 | 0.51 | 766 | 49.00 |
| 40 | 20 | Indian economic ponarama | 8 | 0.51 | 774 | 49.51 |
| 41 | 20 | American economic review | 8 | 0.51 | 782 | 50.02 |
| 47 | 21 | 6 periodicals with 7 citations | 42 | 2.69 | 824 | 52.71 |
| 57 | 22 | 10 periodicals with 6 citations | 60 | 3.84 | 884 | 56.55 |
| 68 | 23 | 11 Periodicals with 5 citations | 55 | 3.52 | 939 | 60.07 |
| 83 | 24 | 15 periodicals with 4 citations | 60 | 3.84 | 999 | 63.91 |
| 118 | 25 | 35 periodicals with 3 citations | 105 | 6.72 | 1104 | 70.63 |
| 193 | 26 | 75 periodicals with 2 citations | 150 | 9.60 | 1254 | 80.23 |
| 502 | 27 | 309 periodicals with 1citation | 309 | 19.77 | **1563** | **100** |

It can be seen from Table 7 that the cited journal articles are scattered in 502 different journals. Among them 'Economic and Political Weekly' occupies first rank being more number of times with 3..26% of citations, followed by 'Indian Journal of Marketing' (2.94%), 'Harvard Business Review' (2.43%), 'Journal of Consumer Research' (2.30%), and 'Journal of Marketing Research' (2.30%).

The first thirteen journals in the rank list contribute more than 25% of total cited journal citations. The first forty one journals covers more than 50% of total cited journal citations. The 118 journals covers nearly 70% total cited journal citations. The remaining 25% of journal citations are scattered among 384 other journals.

## 5.8 Productivity of Cited Journals in Management

The productivity of cited journals in the field of Management is presented in Table 5.8.

**Table 5.8 Productivity of Cited Journals in Management**

| Percentage of Citations | No. of Citations | No .of Covered Journals | Percentage of Journals | Average Productivity |
|---|---|---|---|---|
| 0-25% | 405 | 13 | 2.59 | 31.15 |
| 25-50% | 377 | 28 | 5.58 | 9.92 |
| 50-75% | 472 | 152 | 30.28 | 3.11 |
| 75%-100% | 309 | 309 | 61.55 | 1.00 |
| **Total** | **1563** | **502** | **100** | **3.11** |

It is evident from the Table 5.8 that 25 per cent of the total citations are contributed by thirteen journals in the first group. The average productivity of journals in the first group 31.15 articles, followed by the second group at 9.92 articles, third group 3.11 articles, and the last group only one article. The marked difference confirms the decrease productivity in the individual journals in the rank list.

## 5.9 Bradford Zones in Management

**Table 5.9** Bradford Zones Cited Journals in Management

| Zones | Citations | Journals | Percentage of Journals | Cumulative | | |
|---|---|---|---|---|---|---|
| | | | | No. of Citations | No. of Journals | Percentage of Journals |
| I | 531 | 20 | 3.98 | 531 | 20 | 3.98 |
| II | 468 | 63 | 12.55 | 999 | 83 | 16.53 |
| III | 564 | 419 | 83.47 | 1563 | 502 | 100 |
| **Total** | **1563** | **502** | **100** | **1563** | **502** | **100** |

It is evident from the table 5.9 that there are 20 journals in the nucleus and most productive journals in the field of Management, sharing 3.98% of total citations. The second zone is represented by 63 journals, third zone represented by 419 journals.

## 6. Conclusions

An analysis of 4613 citations appended to 40 Ph.D. theses in Management reveals the following conclusions:

1. Journals and books appear to be the most preferred source of information for research scholars in Management since they contributed the highest number of citations (68.14%).

2. Most of the journal and Books articles in Management (63.05%) are being published by single author.

3. Most of the books and journals were published between 1981 and 2010. This clearly points out that Management researchers are more inclined towards recent and latest editions of books and journals. Hence, an endeavor should be made for the acquisition of latest books and journals on the subject.

4. The journal articles are scattered in 502 different journals. However, most of the citations (50.02%) are found in a few journals. The Journal 'Economic and Political Weekly 'gets first rank for being cited more number of times by the researchers, followed by 'Indian Journal of marketing', 'Harvard Business Review', 'Journal of consumer research' and 'Journal of Marketing Research'.

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# BOOK BORROWING PATTERNS AMONG MECHANICAL ENGINEERING STUDENTS ATJAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY LIBRARY, KAKINADA, A.P.: A CRITICAL STUDY

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***Abstract***

*This paper conducts a critical analysis of the books borrowed by Mechanical Engineering (ME) students of the enrolled Batches of the ACYs: 2019&2020at Jawaharlal Nehru Technological University Library, Kakinada, Andhra Pradesh. The analysis throws light on the different aspects such as number of books borrowed, authorship pattern of the borrowed books, chronology of the borrowed books, country-wide distribution of borrowed books, type of publisher, rank list of the publishers, rank list of the most- frequently borrowed titles. After analysis of each point, appropriate conclusions were drawn.*

**Key Words:** *Borrowed titles, ME students, Circulation data, JNTU Library, Kakinada*

## 1. Introduction

Academic libraries all over the world place dissemination of information and circulation of documents as their core function. In emerging nations like India, dissemination of information and knowledge mostly take place through lending and borrowing of documents. In fact, the resources of a library get optimally utilized through circulation of books among users who prefer them for usage at home or their comfort zones away from library. Collection development is a process of building up and improving the collection in the library and it is a very important function of a library. Users need, collection development policy, selection, acquisition, management-evaluation, weeding out, storage and preservation of collection are the important areas of collection development. In India, user information is largely tapped through book lending activities happening at

academic libraries. However, a proper understanding of the rate and trend of issues, the properties of circulated books is highly desirable for developing a book acquisition system based on real time needs of users. The growing user wants are best mirrored within the circulation trends and figures. Above all, once the circulated records are analyzed, the precise details regarding the book sorts borrowed by postgraduate students also because the variety of books utilized by them clearly emerge. This paper specifically analyzes the books borrowed by Mechanical Engineering students of Nehru Technological university library to draw valid trends and patterns in usage of borrowed books by them.

Jawaharlal Nehru Technological University (JNTU) originally known as 'College of Engineering, Vizagpatnam' was established in the year 1946. The sprawling campus is spread over 110 acres of lush green landscaped space in the fast developing port city of Kakinada, East Coast of peninsula India. This college acquired the status of a constituent institution of the Jawaharlal Nehru Technological University on 2nd Oct' 1972through an act of the AP legislature along with other institutions operating under the control of the then Director of Technical Education, Government of Andhra Pradesh. This university college offers five undergraduate programs and nine postgraduate programs in engineering, management and computer application. In addition to that, the university provides continuing education programmes to diploma and degree holders in engineering. A major attraction of the university is its central library which has 55,457 volumes, 259 national and international print journals, ASCE, ASME, IEEE Explore online journals, DELNET, NPTEL databases, Internet and Intranet facilities etc.

## 2. Objectives

The specific objectives of the study are:

i. To determine the quantum of books borrowed by ME students during their period of study;
ii. To understand the authorship pattern;
iii. To analyze the chronological distribution of books borrowed by ME students;
iv. To know the geographical distribution of borrowed books;
v. To prepare the rank list of most frequently borrowed books;
vi. To prepare the rank list of publishers.

## 3. Hypotheses

The following hypotheses were formulated for testing:

i. Mechanical Engineering students borrowed single-authored books;
ii. Male students borrowed more books than female students;

iii. Mechanical Engineering students prefer the latest books;
iv. Students preferred Indian publications over others.

## 4. Scope and limitation

The present study seeks to conduct a critical analysis on the books borrowed by mechanical engineering students of Jawaharlal Nehru Technological University Library (JNTUL), Kakinada. It is restricted to only the books borrowed by MBA students of the enrolled Batches of the ACYs: 2019& 2020. The present study limits itself to an analysis of data related to borrowed books, not any other means of consultation. In fact, data pertaining to the use of textbooks and reference books consulted in other areas of the library is excluded from the scope of the present study.

## 5. Methodology

At present, the Jawaharlal Nehru Technological University library offers access to undergraduate and postgraduate students; faculty members and supporting staff. The researcher has selected post graduate students in the first instance. Broadly, the post graduate students come under M.Tech, MBA & MCA departments. However, the researcher has selected students from Mechanical Engineering (ME) only for the investigation and analysis in the second instance. The total sample consists of 180mechanical engineering students, out of which the researcher could obtain the book borrowing data of 176 students based on their enrollment in the JNTU library. Out of 176students, 127are male students and 49are female students.

## 6. Analysis

### 6.1 Gender

The classification of borrowed books by postgraduate students of mechanical engineering according to their gender wise is displayed in Table 1.

**Table 4.7**

**Table 1: Gender-wise classification of borrowed books by mechanical engineering students**

| Sex | Number of Students | Number of books borrowed | Percentage | Average number of books borrowed per student |
|---|---|---|---|---|
| Male | 127 | 2921 | 80.98 | 23 |
| Female | 49 | 686 | 19.02 | 14 |
| **Total** | **176** | **3607** | **100.00** | **20** |

Table 1 indicates that a majority of books (80.98%) in mechanical engineering were borrowed by male students for home reading purpose, whereas 19.02 percent of the books were borrowed by female students. It is also evident that each student borrowed in mechanical engineering 20 books on an average during his/her study period. On an average, male students borrowed 23 books during their period of study, while female students borrowed 14 books on an average.

### 6.2 Number of books borrowed

The distribution of mechanical engineering students according to the number of books borrowed for their usage is shown in Table 2

**Table 2: Distribution of students according to the number of books borrowed**

| S. No | Number of books | Students | |
|---|---|---|---|
| | | Number | Percentage |
| 1 | 1 – 5 | 6 | 3.41 |
| 2 | 6 – 10 | 9 | 5.11 |
| 3 | 11 – 15 | 18 | 10.23 |
| 4 | 16 – 20 | 21 | 11.93 |
| 5 | 21 – 25 | 15 | 8.52 |
| 6 | 26 – 30 | 46 | 26.14 |
| 7 | 31 – 35 | 25 | 14.20 |
| 8 | 36 – 40 | 19 | 10.80 |
| 9 | 41 and above | 17 | 9.66 |
| **Total** | | **176** | **100.00** |

Table 2 indicates that 46 (26.14%) members of mechanical engineering students have borrowed between 26-30 books for their usage; 25(14.20%) students borrowed between 31-35 books; 21 (11.93%) students borrowed between 16-20 books; 19(10.80%) students borrowed between 36-40 books; 18(10.23%) students borrowed between 11-15 books; 17(9.66%) students borrowed between 41 and above books; 15(8.52%) students borrowed between 21-25 books; 9(5.11%) students borrowed between 6-10 books; and the remaining 6(3.41%) students borrowed between 1-5 books.

### 6.3 Authorship pattern of borrowed books

The distribution of books borrowed by ME students according to authorship pattern is shown in Table 3.

**Table 3: Authorship pattern of borrowed books**

| S.No | Author | Borrowed Books | |
|---|---|---|---|
| | | Number | Percentage |
| 1 | Single | 1621 | 44.94 |
| 2 | Double | 865 | 23.98 |
| 3 | Three | 649 | 17.99 |
| 4 | More than three | 472 | 13.09 |
| **Total** | | **3607** | **100.00** |

Table 3 indicates that a majority of the books (44.94%) borrowed by mechanical engineering students are written by single authors; 23.98 percent of borrowed books are written by double authors; 17.99 percent of borrowed books are written by three authors; and the remaining 13.09 percent borrowed books are written by more than three authors. Hence, it can be concluded that a majority of the mechanical engineering students borrowed multi-authored books for their usage.

### 6.4 Chronological distribution of borrowed books

The distribution of books borrowed by ME students according to the year of publication is shown in Table 4.

**Table 4: Chronological distribution of borrowed books**

| S.No | Year | Books | |
|---|---|---|---|
| | | Number | Percentage |
| 1 | 1981 – 1985 | 9 | 0.25 |
| 2 | 1986 – 1990 | 41 | 1.14 |
| 3 | 1991 – 1995 | 88 | 2.44 |
| 4 | 1996 – 2000 | 187 | 5.18 |
| 5 | 2001 – 2005 | 243 | 6.74 |
| 6 | 2006 – 2010 | 406 | 11.26 |
| 7 | 2011 – 2015 | 1515 | 42.00 |
| 8 | After 2015 | 1118 | 30.99 |
| **Total** | | **3607** | **100.00** |

Table 4 indicates that most of the books (42%) borrowed by mechanical engineering students were published between 2011 and 2015, whereas 30.99 percent of the borrowed books were published after 2015. 11.26 percent of the

borrowed books were published between 2006 and 2010; 6.74 percent of the borrowed books were published between 2001 and 2005; 5.18 percent of the borrowed books published between 1996 and 2000. 2.44 percent of the borrowed books were published between 1991 and 1995. 1.14 percent of the borrowed books were published between 1986 and 1990. The remaining 0.25 percent of the borrowed books was published between 1981 and 1985. Hence, it can be concluded that a majority of the borrowed books by electrical and electronics engineering students for their usage were published in the latest years.

## 6.5 Country-wise distribution of borrowed books

The classification of borrowed books by ME students according to the country of publication is shown in Table 5.

**Table 4.35**

**Table 5: Country-wise distribution of borrowed books**

| S.No | Country | Books | | Cumulative | |
|---|---|---|---|---|---|
| | | Number | Percentage | Number | Percentage |
| 1 | India | 2291 | 63.52 | 2291 | 63.52 |
| 2 | U.S.A | 592 | 16.41 | 2883 | 79.93 |
| 3 | U.K | 319 | 8.84 | 3202 | 88.77 |
| 4 | Japan | 83 | 2.30 | 3285 | 91.07 |
| 5 | Singapore | 75 | 2.08 | 3360 | 93.15 |
| 6 | Russia | 67 | 1.86 | 3427 | 95.01 |
| 7 | Australia | 36 | 0.99 | 3463 | 96.00 |
| 8 | Newzealand | 28 | 0.78 | 3491 | 96.78 |
| 9 | Netherlands | 19 | 0.53 | 3510 | 97.31 |
| 10 | Germany | 16 | 0.44 | 3526 | 97.75 |
| 11 | Other countries | 81 | 2.25 | **3607** | **100.00** |

Table 5 indicates that a majority of the books (63.52%) borrowed by mechanical engineering students were published in India. It is also evident from the table that 16.41 percent of books borrowed by ME students originated from the U.S.A.; 8.84 percent of the borrowed books originated from the U.K.; 2.30 percent of the borrowed books were published in Japan; 2.08 percent of the borrowed books were from Singapore; 1.86 percent of the books originated from Russia; 0.99 percent of the borrowed books originated from Australia; 0.78 percent of the borrowed books originated from Newzealand; 0.53 percent of the borrowed books

originated from Netherland; 0.44 percent of the borrowed books were published from Germany. The remaining 2.25 percent of the borrowed books were published from other countries. Hence, it can be concluded that more than half of the books borrowed by ME students for their usage were published in India.

### 6.6 Type of publishers

In order to ascertain whether the preference of mechanical engineering students is towards the books published by the national publishers or international publishers, the borrowed books were divided into two groups' viz., national publishers or international publishers based on the place of publication.

The distribution of books borrowed by mechanical engineering students according to the type of publisher is shown in Table 6.

**Table 6: Publishers wise distribution of borrowed books**

| S.No | Publisher | Books | |
|---|---|---|---|
| | | Number | Percentage |
| 1 | National | 2291 | 63.52 |
| 2 | International | 1316 | 36.48 |
| **Total** | | **3607** | **100.00** |

Table 6 indicates that most of the borrowed books (63.52%) borrowed by mechanical engineering students were published by national publishers and the remaining 36.48 percent of books were published by international publishers. Hence, it can be concluded that the mechanical engineering students tend to use a large number of books published by national publishers.

### 6.7 Rank list of most frequently used books

The rank list of most frequently borrowed books by mechanical engineering students for their usage is shown in Table 7.

**Table 7: Rank list of most frequently borrowed books by mechanical engineering students**

**Table 7: Rank list of most frequently borrowed books by Mechanical Engineering**

| S.No | Title of the book | Rank | Used | | Cumulative | |
|---|---|---|---|---|---|---|
| | | | No | % | No | % |
| 1 | Robotic Engineering/ Richard D.Klafter | 1 | 198 | 5.49 | 198 | 5.49 |
| 2 | Discrete event system simulation/ J.Banks and others | 2 | 141 | 3.91 | 339 | 9.40 |
| 3 | Optimization for engineering design/ Kalyanmoy Deb | 3 | 112 | 3.11 | 451 | 12.51 |
| 4 | CAD/CAM principles and applications/ P.N. Rao | 4 | 104 | 2.88 | 555 | 15.39 |
| 5 | Procedural elements for computer graphics/D.F. Rogers | 5 | 92 | 2.55 | 647 | 17.94 |
| 6 | Introduction to nanotechnology/ Pole and Owens | 6 | 77 | 2.13 | 724 | 20.07 |
| 7 | Manufacturing engineering and technology/ Kalpakijian | 7 | 71 | 1.97 | 795 | 22.04 |
| 8 | An introduction to reliability and maintainability engineering/ C.E. Ebeling | 8 | 65 | 1.80 | 860 | 23.84 |
| 9 | Engineering optimization/ S.S. Rao | 9 | 63 | 1.75 | 923 | 25.59 |
| 10 | Mechatronics electronics control system in mechanical and electrical engineering/ W. Bolton | 10 | 54 | 1.50 | 977 | 27.09 |
| 11 | Computer aided design manufacturing/ K. Lalit Narayan, K. Mallikarjuna Rao and M.M.M. Sarcar | 11 | 51 | 1.41 | 1028 | 28.50 |
| 12 | Nanochemistry: A chemical approach to nanomaterials/ Ozin and Arsenault | 12 | 48 | 1.33 | 1076 | 29.83 |
| 13 | Numerical methods for engineers/ Steven C.Chapra and Raymond P. Canale | 13 | 47 | 1.30 | 1123 | 31.13 |

| | | | | | | |
|---|---|---|---|---|---|---|
| 14 | Computer aided process planning/ JosepsTulkoff | 14 | 45 | 1.25 | 1168 | 32.38 |
| 15 | Elements of computer graphics/ Roger and Adams | 15 | 41 | 1.14 | 1209 | 33.52 |
| 16 | Introduction to manufacturing processes/ John A Schey | 16 | 39 | 1.08 | 1248 | 34.60 |
| 17 | Computer control of manufacturing systems/ YoramKoren | 17 | 38 | 1.05 | 1286 | 35.65 |
| 18 | Genetic algorithms in search, optimization and machine learning/ D.E. Goldberg | 18 | 37 | 1.03 | 1323 | 36.68 |
| 19 | Mathematical methods for physics and engineering/ K.F. Riley, M.P. Hobson and S.J. Bence | 19 | 36 | 1.00 | 1359 | 37.68 |
| 20 | Finite element method in heat transfer and fluid dynamics/ J.N.Reddy | 20 | 33 | 0.91 | 1392 | 38.59 |
| 21 | Reliability theory and practice/ I. Bazovsky | 21 | 31 | 0.86 | 1423 | 39.45 |
| 22 | Process and materials and manufacturing/ R.A. Lindburg | 22 | 30 | 0.83 | 1453 | 40.28 |
| 23 | Multi objective genetic algorithm/ Kalyanmoy Deb | 23 | 28 | 0.78 | 1481 | 41.06 |
| 24 | Perfromance modeling of automated manufacturing systems/ N.Viswanadham and Y.Narahair | 24 | 27 | 0.75 | 1508 | 41.81 |
| 25 | Simulation modeling and analysis/ A.M.Law and W.D. Kelton | 25 | 25 | 0.69 | 1533 | 42.50 |
| 26 | Robotics and control/ R.K.Mittal and Nagarath | 25 | 25 | 0.69 | 1558 | 43.19 |
| 27 | MEMS and micro systems and design and manufacture | 26 | 24 | 0.66 | 1582 | 43.85 |
| 28 | Introduction to Robotics/S.K. Saha | 27 | 21 | 0.58 | 1603 | 44.43 |

| | | | | | | |
|---|---|---|---|---|---|---|
| 29 | CAD/CAM theory and practice/Ibrahim Zeid | 28 | 19 | 0.53 | 1622 | 44.96 |
| 30 | Robot analysis and intelligence/Asada and Sloine | 29 | 18 | 0.50 | 1640 | 45.46 |
| 31 | Nanoscale science and technology/ Kelsall, Hamley and Geoghegan | 29 | 18 | 0.50 | 1658 | 45.96 |
| 32 | Mechatronics integrated mechanical electronics systems/ K.P Ramachandran and G.K.VijayaRaghavan | 29 | 18 | 0.50 | 1676 | 46.46 |
| 33 | Design for manufacture/ John Cobert | 30 | 17 | 0.47 | 1693 | 46.93 |
| 34 | Applied numerical analysis/Curtis F. Gerald and Patrick O. Wheatly | 31 | 16 | 0.44 | 1709 | 47.37 |
| 35 | Microelectronics packaging handbook/ R.Thummala Rao and E.J.Rymaszewski | 32 | 15 | 0.42 | 1724 | 47.79 |
| 36 | Industrial robotics/ M.P.Groover | 32 | 15 | 0.42 | 1739 | 48.21 |
| 37 | Principles of computer aided design and manufacturing/ FaridAmirouche | 32 | 15 | 0.42 | 1754 | 48.63 |
| 38 | Introduction to robotic mechanics and control/J.J.Craig | 33 | 14 | 0.39 | 1768 | 49.02 |
| 39 | Finite element method/O.C. Zienckiwicz and R.L.Taylor | 33 | 14 | 0.39 | 1782 | 49.41 |
| 40 | Advanced machine processes/ V.K.Jain | 33 | 14 | 0.39 | 1796 | 49.80 |
| 41 | Introduction to nanoscale science and technololgy/ Di Ventra, Evoy and Heflin Kluwer | 34 | 13 | 0.36 | 1809 | 50.16 |
| 42 | Numerical mathematics and computing/ Ward Cheney and David Kincaid | 35 | 12 | 0.33 | 1821 | 50.49 |

| | | | | | | |
|---|---|---|---|---|---|---|
| 43 | Numerical methods/ Douglas J.Faires and Richard Burden | 35 | 12 | 0.33 | 1833 | 50.82 |
| 44 | Computer aided process planning/ Hsu-Pin Wang and Jain Kang Li | 36 | 11 | 0.30 | 1844 | 51.12 |
| 45 | Robot dynamics and control/ Mark W. Spong and M.Vidyasagar | 36 | 11 | 0.30 | 1855 | 51.42 |
| 46 | Geometric modeling/ MichealE.Mortenson | 36 | 11 | 0.30 | 1866 | 51.72 |
| 47 | Optical design/ Jasbir Arora | 37 | 10 | 0.28 | 1876 | 52.00 |
| 48 | Robotics/ K.S. Fu | 37 | 10 | 0.28 | 1886 | 52.28 |
| 49 | Machine Tool Design and Numerical Control/N.K. Mehta | 37 | 10 | 0.28 | 1896 | 52.56 |
| 63 | 14 books 9 times each | 38 | 126 | 3.49 | 2022 | 56.05 |
| 84 | 21 books 8 times each | 39 | 168 | 4.66 | 2190 | 60.71 |
| 100 | 16 books 7 times each | 40 | 112 | 3.10 | 2302 | 63.81 |
| 133 | 33 books 6 times each | 41 | 198 | 5.49 | 2500 | 69.30 |
| 178 | 45 books 5 times each | 42 | 115 | 3.19 | 2615 | 72.49 |
| 241 | 63 books 4 times each | 43 | 252 | 6.99 | 2867 | 79.48 |
| 309 | 68 books 3 times each | 44 | 204 | 5.66 | 3071 | 85.14 |
| 430 | 121 books 2 times each | 45 | 242 | 6.71 | 3313 | 91.85 |
| 724 | 294 books 1 time each | 46 | 294 | 8.15 | **3607** | **100.00** |

It is evident from Table 7 that a total of 724 titles and 3607 volumes of books were borrowed by mechanical engineering students for their usage during their period of study.

It is also evident from the present study that the book entitled, '***Robotic Engineering/ Richard D.Klafter***' was borrowed more number of times than any other book bagging the first rank amongst the books borrowed by mechanical engineering students for their usage. The books entitled, ***'Discrete event system simulation/ J.Banks and others', 'Optimization for engineering design/ Kalyanmoy Deb', 'CAD/CAM principles and applications/ P.N. Rao',*** *and*

***'Procedural elements for computer graphics/D.F. Rogers'*** secured 2nd, 3rd, 4th, and 5th ranks, respectively as per the number of times borrowed by students. All these titles account for 17.94 percent of the total borrowing. Thus, it may be concluded that only a few titles have been borrowed more frequently by mechanical engineering students.

### 6.8 Productivity of borrowed books in terms of titles

The productivity of books borrowed by mechanical engineering students as per the number of titles covered is presented in Table 8.

**Table 8: Productivity of borrowed books**

| Percentage of borrowed books | No. of Books | No. of Titles Covered | Percentage of Titles | Average Productivity |
|---|---|---|---|---|
| 0-25% | 923 | 9 | 1.24 | 102.55 |
| 26-50% | 886 | 32 | 4.42 | 27.69 |
| 51-75% | 806 | 137 | 18.92 | 5.88 |
| 76-100% | 992 | 546 | 75.42 | 1.81 |
| **Total** | **3607** | **724** | **100.00** | **4.98** |

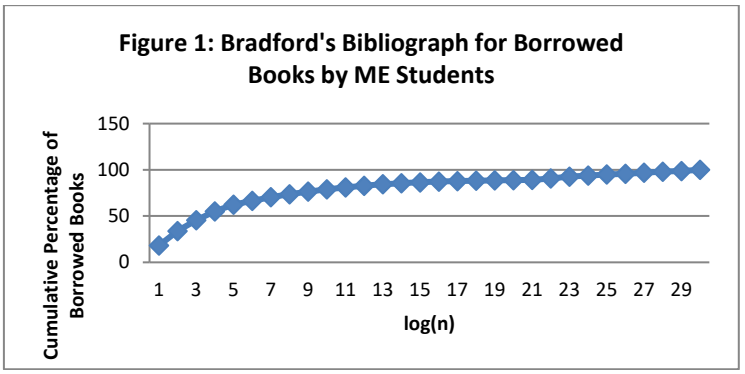
It is observed from Table 8 that 25 percent of the total books borrowed by mechanical engineering students are contributed by only nine titles in the first group. The average rate of productivity of titles in the first group is 102.55 volumes, followed by the second group at 27.69 volumes, third group at 5.88 volumes and the last group at only 1.81 volumes. This marked difference confirms the decreasing productivity of individual titles in the rank list and concentration of maximum number of books in just nine titles.

### 6.9 Application of Bradford's Law of Scattering

Data obtained in the study (as indicated in Table 7) has been to put to test against the Bradford's Law of scattering. Bradford's graphs for borrowed books by mechanical engineering students have been plotted by taking the cumulative number of volumes R(n) on the Y-axis and the Log of the number of borrowed titles on the X-axis.

**Table 9: Bradford's Zones for Mechanical Engineering (ME)**

| Zones | Borrowed Books | Titles | Percentage of Titles |
|---|---|---|---|
| I | 1209 | 15 | 2.07 |
| II | 1291 | 118 | 16.30 |
| III | 1107 | 591 | 81.63 |
| **Total** | **3607** | **724** | **100.00** |




It is evident from Table 9 that there are 15 titles covered the core of the first zone, which are the most productive titles borrowed by mechanical engineering students, sharing 2.07 percent of the total borrowed titles; the second zone is represented by 118 titles, which share 16.30 percent of the total borrowed titles; and the last zone is represented by 591 titles that share 81.63 percent of the total borrowed titles. Each zone has approximately one third (1/3) of the total borrowed books. Hence, the distribution of titles as per the Bradford's Law reveals a ratio of 15: 118: 591.

## 7. Conclusions and suggestions

The following conclusions have been drawn from the present study:

i. A majority of books (80.98%) in mechanical engineering were borrowed by male students for home reading purpose, whereas female students borrowed 19.02 percent of the books.

ii. Each student in mechanical engineering borrowed 20 books on an average during his/her study period. On an average, male students borrowed 23 books during their period of study, while female students borrowed 14 books on an average.

iii. A majority of Mechanical Engineering (ME) students borrowed between 26 and 30 books during the period of their study.

iv. A majority of the books (44.94%) borrowed by Mechanical Engineering students are written by single authors; 23.98 percent of borrowed books are written by two authors; 17.99 percent of borrowed books are written by three authors; and the remaining 13.09 percent borrowed books are written by more than three authors.

v. Most of the books (42%) borrowed by Mechanical Engineering students were published between 2011 and 2015; and 72.99 percent of the books were published in the recent years.

vi. The students of Mechanical Engineering (ME) heavily depended on books published from India (63.52%), U.S.A (16.41%) and U.K. (8.84%).

vii. Most of the borrowed books (63.52%) borrowed by Mechanical Engineering students were published by national publishers and the remaining 36.48 percent of books published by international publishers.

viii. A total of 724 titles and 3607 volumes of books were borrowed by Mechanical Engineering students for their usage during their period of study. 'Robotic Engineering/ Richard D.Klafter' was borrowed more number of times than any other book bagging the first rank amongst the books borrowed by mechanical engineering students for their usage. The top five titles account for 17.94 percent of the total borrowing and the fourty nine titles (listed in Table 4.56) account for 52.56 percent.

ix. The first 25 percent of the total books borrowed by Mechanical Engineering students are contributed by only nine titles in the first group. The average rate of productivity of titles in the first group is 102.55 volumes, followed by the second group at 27.69 volumes, third group at 5.88 volumes and the last group at only 1.81 volumes. This marked difference confirms the decreasing productivity of individual titles in the rank list and concentration of maximum number of books in just nine titles.

x. Fifteen titles covered the core of the first zone, which are the most productive titles borrowed by Mechanical Engineering students, sharing 2.07 percent of the total borrowed titles; the second zone is represented by 118 titles, which share 16.30 percent of the total borrowed titles; and the last zone is represented by 591 titles that share 81.63 percent of the total borrowed titles. Each zone has approximately one third (1/3) of the total borrowed books. Hence, the distribution of titles as per the Bradford's Law reveals a ratio of 15: 118: 591.

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# Research output of Central Universities of South India (2012–2021): A Scientometric Analysis

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## Abstract:

*As a result, the number of papers published, citations received, and the frequency with which keywords appear in both open-access and closed-access publications at Central Universities at South India are all used to represent the current condition of research in the region. The Web of Science databases provided the majority of the study's raw data.*

## Introduction:

It was essential to summarise and comprehend the resulting information complexity as a result of scientific publications' worldwide exponential growth and improvement in order to study and evaluate it. As an advanced branch of bibliometrics, Scientometrics provides a framework for assessing emerging concepts and tracking publication patterns in a specific topic for future policy and research (Kasemodelet al., 2016; Guzeller and Celikaer, 2017; Nalimov, 1966). Author output, authoring habits, relative growth rate, & collaborative works between countries, authors, & institutions are among the many aspects that it is regarded as a science concerning science that helps to comprehend trends and growth (Mulla, 2012). In contrast to citations, consumption metrics and altimetric are still in their infancy when it comes to quantifying research impact (Gorraiz et al., 2014; Hammarfelt, 2014). The current study is a Scientometrics of South Indian Center Colleges and Universities of Web of Science citations from 2012 to the present. According to the Indian Ministry of Human Resource Development, each state and area in the country will have a Central University, which will serve as a national hub for higher learning and scientific investigation. Currently, researchers

are under more pressure to perform than to produce excellent results. A standard method for examining research trends is to use bibliometric measurements, but articles published based on research conducted by researchers themselves in journals with high impact factors, the total number of citations cited in those articles, the number of patents awarded based on that research, and the amount of funding dedicated to it can all be used to assess research quality as well as trends. Collaboration between R&D institutions, universities, and R&D institutions, as well as between regions/countries & interdisciplinary and multidisciplinary research, is also taken into account when assessing research trends.

## Scope and Limitation

In this study, we'll look at how researchers' output is published, how many citations they get, and how they interact with the larger research community. Research findings from unpublished research articles or anything else except research publications are not analyzed in this study's main shortcoming.

## Objectives

The main objectives of the study are pertaining to;

- Analyze the Open Access and Non Opens Access publications of Central Universities from South India
- Extricate the major keywords occurred.
- To scrutinize quantity of papers published by the research community of south-central universities
- To identify the productive publications made by the research community of south-central universities

## Methodology

Our research depended on the Web of Science for its primary data, which was input as a keyword for each major university in South India. The data was then tabulated in a different style to fulfil our study's goals. Central Universities of Karnataka, Kerala, Pondicherry, Tamil Nadu, the English & Foreign Languages University of Hyderabad, and Tamil Nadu Central University were all included in this study.

## Result and Discussion

Distribution of research articles output by type of access and documents:

Researchers and academics of specified south Indian universities contributed a total of 17,054 publications between 2012 and 2021, with 3810 open access articles & 13,244 non-open access ones. We chose all of the disciplines from the top ten

universities in South India. From the table, you can see the contribution of articles published in chosen south Indian universities. University of Hyderabad has the maximum publication of articles in open access (60 percent) and non-open access (59.3%), Pondicherry University seems to have the second largest publication of articles in open access (25.8%) & non-open access (30.86%), and Central University of Kerala does have the third highest publication of articles in open access (6.036 percent) and non-open access (4.122 percent). The most pervasive impact on all fields is research publications (Mahala & Carg,2020). These 17,054 research publications were subjected to a more extensive bibliometrics study by the authors in order to satisfy the stated goals. The remaining documents (editorial material, proceedings, and books) were left out of the analysis since they provide less scientific knowledge and are only sometimes acknowledged in the literature.

**Table.no.1 Selected Universities Wise Open Access Articles and Non-Open Access**

| | | Open Access | | Non-Open Access | |
|---|---|---|---|---|---|
| Sr. No | University | Total No. of Articles | Percentage | Total No.of. Articles | Percentage |
| 1 | Central University of Karnataka | 86 | 2.25 | 178 | 1.34 |
| 2 | Central University of Kerala | 230 | 6.04 | 546 | 4.12 |
| 3 | Pondicherry University | 983 | 25.80 | 4088 | 30.86 |
| 4 | Central university of Tamil Nadu | 184 | 4.83 | 475 | 3.59 |
| 5 | English & Foreign Languages University | 18 | 0.47 | 102 | 0.77 |
| 6 | University of Hyderabad | 2309 | 60.60 | 7855 | 59.30 |
| **Total No. of Articles** | | **3810** | | **13244** | |

## I. Open Access Articles:

Over the past 20 years, the internet's technological capabilities have revolutionised the publication of peer-reviewed journal papers. To begin with, electronic publishing has become the principal distribution mechanism for scholarly journals. Since electronic journals are relatively inexpensive to create, scholars and

publishers can experiment with novel business models that allow anyone who has internet connection to read papers (known as "open access" or OA) and collect funds for publication through other means than charging readers. Pre-publication versions of published articles in membership journals can also be made more accessible by submitting them to OA online archives.

It all started in the 1990s, but as the Web became more popular around the world, open access to scientific resources became a global phenomenon. As a result of open access (OA), anyone can read and share an article's full content for free. In addition, this data can be used by the user to develop software or other legal applications, with no restrictions on technology, law, or finances. There is only one thing to consider when it comes to copyright in open access papers: accurate citations of preceding work. Many OA models have evolved throughout time, but the hybrid model remains the most important. These include green, gold, and diamond OA models. As of 2020, Allahar & Sookram A few publications in a journal will be published as open access if the authors pays an article processing charge (APC). This is because many publishers allow the hybrid method. A new surge of involvement, debate, and relevance has arisen as a result of open access. There is a possibility that open access and academic communication as a whole are nearing a tipping point in their progress. Large-scale, high-quality data on the growth and quality of the OA publications is still needed, despite current OA activity and discussion. A information "state of OA" assessment that is large-scale, current, and repeatable is particularly needed.

***Distribution of output by authors in open access***

In the recent twelve years (2012–2021), the authorship pattern for research output has changed. It appears that mega-authored papers have a stronghold over the years. In the last twelve years, single author papers have received a much reduced percentage of publications (3.15 percent). Dual-authored, three-authored, fourth-authored, five-authored, & mega-authored (>4) papers account for 16.43%, 15.42%, 14.42 percent, 14.42 percent, 9.83 percent, and 40.72 percent of total articles, respectively. Mega-authored publications clearly dominated in all fields of study at a few south Indian universities. Collaboration among researchers from various universities helps to expand the effect of research in the realm of science and management. (Walke et al., 2007; Karpagam et al., 2011). Table.2 shows that output authors' open access publications and contributions are open to the public.

**Table.No.2 Selected Author Wise Open Access Articles**

| | | Open Access | |
|---|---|---|---|
| Sr.No | Author Wise | Total No. of Articles | Percentage |
| 1 | Single Author | 97 | 3.16 |
| 2 | Two Authors | 505 | 16.44 |
| 3 | Three Authors | 474 | 15.43 |
| 4 | Four Authors | 443 | 14.42 |
| 5 | Five Authors | 302 | 9.83 |
| 6 | Mega- Authors | 1251 | 40.72 |
| **Total Articles** | | **3072** | |

***Distribution of authors output with citation***

The number of citations in research papers is a good indicator of the influence of scholarly communication. Table 3 depicts the open access citations pattern of publications published in all fields between 2012 and 2021. We've compiled a list of the top 10 writers with the highest citations score on Web of Science out of 3810. Hyde.et.al has the maximum citation rating, Hongsaman. S et al has the 2nd highest score, and Boonmee, S et al does have the third highest score, as shown in the table. Increased citations received and corresponding research impact lead to increased collaboration among diverse authors from various institutes (Heilig and Vob, 2014; Gupta et al., 2015).

**Table.no.3 OPEN ACCESS HIGHEST CITATION**

| SR.NO | NAME OF THE AUTHOR | CITATION SCORE |
|---|---|---|
| 1 | Hyde, KD et al | 2099 |
| 2 | Hongsanan, S et al | 1146 |
| 3 | Hongsanan, SA et al | 804 |
| 4 | Boonmee, S et al | 728 |
| 5 | Rashmi, M et al | 680 |
| 6 | Phookamsak, R et al | 663 |
| 7 | Yuan, HS et al | 590 |
| 8 | Gautam, AK et al | 572 |
| 9 | Hyde, KVD et al | 550 |
| 10 | Kattge, J .et.al | 489 |

***Co-authorship analysis through Vos viewers***

Table 4 depicts the pattern of co-authorship. The CAI is the most effective approach to display the pattern of co-authorship in papers. As time goes on, the strength of co-author relationships implies an increase in multi-authorship trends. The vosviwers networking analysis can reveal the co-author relationship & collaboration. Co-authorship analysis can be understood through clusters, according to the network analysis. It is possible to see the whole intensity of the authorship relationship with other authors.

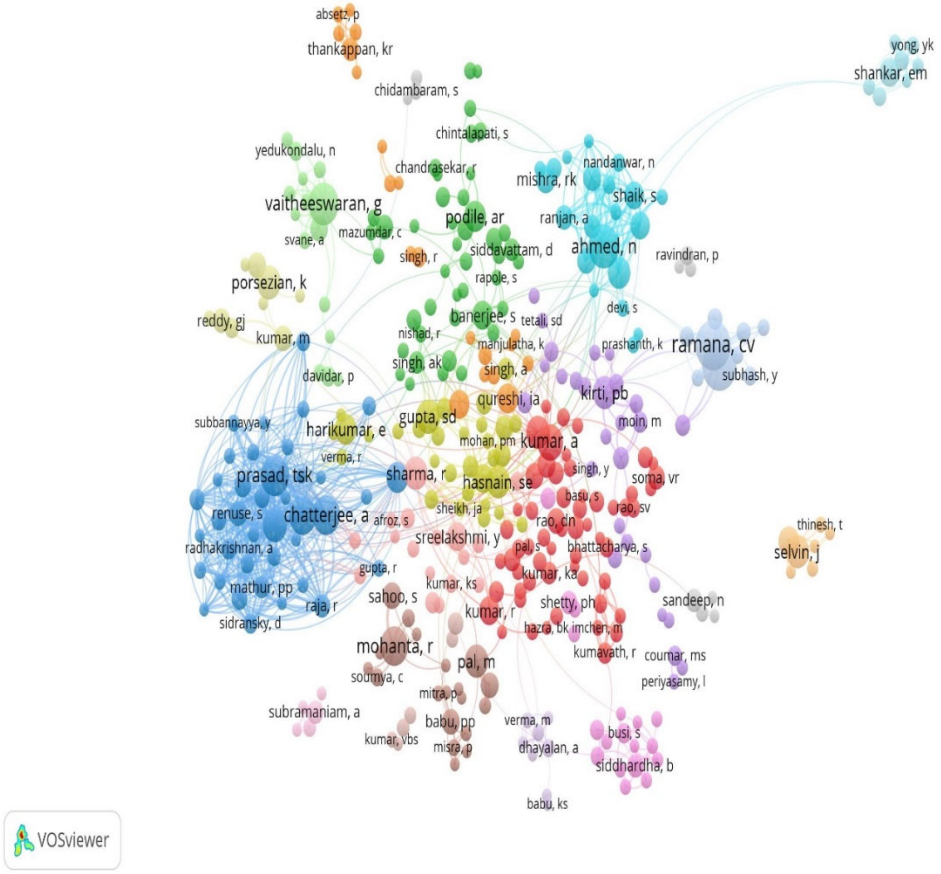



Figure no.1 Author and Co-Authorship network link strength and citation

**Table no.4 Most Co-Authorship network visualization**

| Id | Author | Documents | Total Link Strength |
|---|---|---|---|
| 5255 | Prasad, Tsk | 39 | 344 |
| 4887 | Pandey, A | 35 | 286 |
| 2250 | Gowda, H | 28 | 285 |
| 1195 | Chatterjee, A | 37 | 251 |
| 5910 | Renuse, S | 15 | 166 |
| 4585 | Nanjappa, V | 12 | 154 |
| 114 | Ahmed, N | 44 | 151 |
| 5126 | Pinto, Sm | 13 | 143 |
| 5461 | Raja, R | 13 | 136 |
| 5598 | Ramana, Cv | 58 | 132 |
| 5393 | Radhakrishnan, A | 11 | 131 |
| 6063 | Sahasrabuddhe, Na | 11 | 131 |
| 6269 | Sasikala, C | 56 | 130 |
| 7152 | Syed, N | 11 | 130 |

The author with more total links must be taken into account. We've chosen the top 15 publishers who have a strong co-authorship relationship. The collaboration coefficient (CC) is also another metric used to track how various authors collaborate over time. The value of the CC link increases over time, indicating that the publication's co-authorship is growing (Table 4). Various scientometrics research in science research also show that Indian science research is becoming more collaborative locally and internationally (Gupta et al., 2011; Mulla, 2012). India's domestic and international collaborations in science research contributes to the scientific impact of Indian writers' discoveries (Gupta et al., 2011).

***Distribution based on Keyword of open access***

The keyword are the particular terms used in the article to draw attention to the most important information to make it searchable. The VOS viewer maps is shown in Figure 2 and the current study examines the presence of frequently utilized author keywords. The size of the circle is related to the frequency with which a single keyword is used throughout all fields of research. The various patches of colour represent various sets of keywords that are commonly utilized in publications from prominent south Indian colleges. Expression, identification, protein, growth, and activation were the most frequently used keywords. Intra-association between keywords is represented by the width of the network line. The stronger the bond, the thicker the line. For the keywords stated above, the lines is thicker (Figure 2).

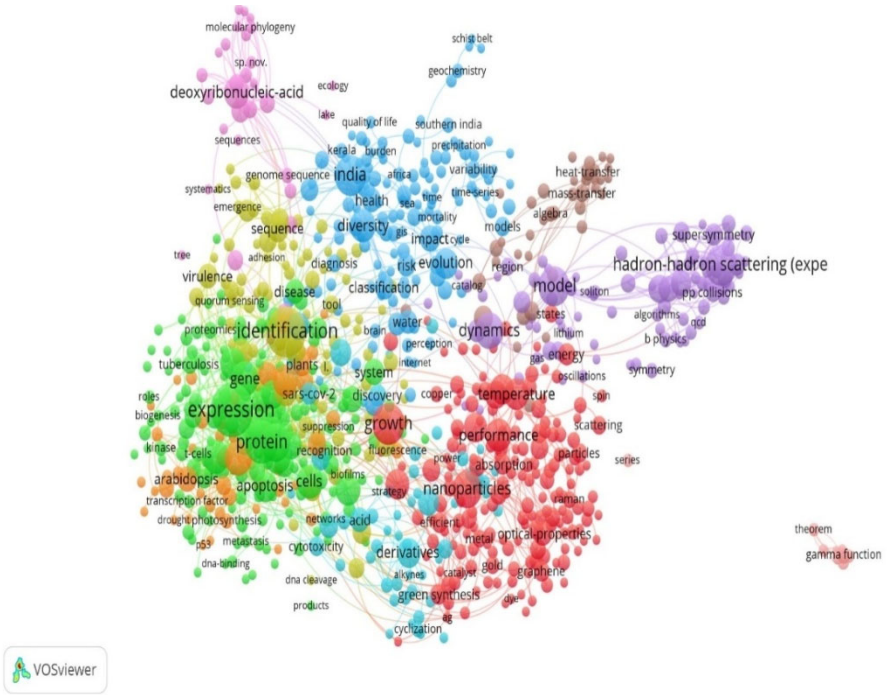



Figure No.2 Keyword Occurrence and Total link strength of open access

**Table No. 5 Highest Keyword Link Strength and Occurrences**

| Id | Keyword | Occurrences | Total Link Strength |
|---|---|---|---|
| 5093 | Expression | 129 | 613 |
| 7075 | Identification | 113 | 478 |
| 11892 | Protein | 82 | 376 |
| 6312 | Growth | 74 | 302 |
| 353 | Activation | 65 | 284 |
| 9791 | Nanoparticles | 62 | 253 |
| 10636 | Oxidative Stress | 53 | 224 |
| 2455 | Cells | 50 | 221 |
| 5926 | Gene | 52 | 217 |
| 6389 | Hadron-Hadron Scattering (Experiments) | 72 | 209 |
| 4218 | Diversity | 49 | 201 |
| 7221 | In-Vitro | 50 | 199 |
| 7353 | Infection | 46 | 198 |
| 11953 | Proteins | 45 | 198 |

The link strength of such keywords employed in various published studies is represented in the table above. Among open articles collected across chosen south Indian universities, we have identified the best 15 keywords network strength, with expression having the strongest link, identification having the second strongest link, and protein having the third strongest link.

## II Non-Open Access:

One alternative is the author-pays model, which places the burden of publication costs squarely on the shoulders of writers and their institutions. In order to submit journal articles to these publications, some authors may experience financial difficulties. As per Solomon, Laakso, and Björk, the expense of converting a magazine to an OA model for societies with low publication volumes can be prohibitive (2016). It was also shown by Björk (2012) that the author-pays approach is unpopular among writers in hybrid journals.

In this model, the article processing fee (APC) is too high for many investigators, and publishing companies try and address this problem inside a variety of ways, which include fee waiver policy initiatives, directly financially supporting scholarly publishing without profit making intermediaries, and so on. According to Peterson et al (2013), In-depth, prospective bibliometric studies can help publishers and societies make informed decisions and assess the risks and advantages of journal flipping because these effects are so significant to people in charge of publication management.

### *Distribution of output by authors in open access*

In the recent twelve years (2012–2021), the authorship distribution of research output has changed. It appears that mega-authored papers have a stronghold over the years. In the last twelve years, single author papers have received a much reduced percentage of publications (5.07 percent). Articles with two authors, three authors, four authors, five authors, as well as mega-authored (>4) papers account for 14.02 percent, 16.27 percent, 9.77 percent, 23.44 percent, and 31.00 percent of total publication, respectively. Mega-authored publications clearly dominated in all fields of study at a few south Indian universities. Collaboration among researchers from various universities helps to expand the effect of research in the realm of science and management. (Walke et al., 2007; Karpagam et al., 2011). The open access publishing of output writers, as well as their contribution, may be seen in the table. 6

**Table.No.6 Selected Author Wise Open Access Articles**

| | | Non-Open Access | |
|---|---|---|---|
| Sr.No | Author Wise | Total No. of Articles | Percentage |
| 1 | Single Author | 672 | 5.07 |
| 2 | Two Authors | 1857 | 14.02 |
| 3 | Three Authors | 2156 | 16.27 |
| 4 | Four Authors | 1295 | 9.77 |
| 5 | Five Authors | 3158 | 23.84 |
| 6 | Mega- Authors | 4106 | 31.00 |
| | | | |
| | Total Articles | 13244 | |
| | | | |

Distribution of authors output with citation of non-open access
In the recent twelve years (2012–2021), the authorship distribution of research output has changed. It appears that mega-authored papers have a stronghold over the years. In the last twelve years, single author papers have received a much-reduced percentage of publications (5.07 percent). Articles with two authors, three authors, four authors, five authors, as well as mega-authored (>4) papers account for 14.02 percent, 16.27 percent, 9.77 percent, 23.44 percent, and 31.00 percent of total publication, respectively. Mega-authored publications clearly dominated in all fields of study at a few south Indian universities. Collaboration among researchers from various universities helps to expand the effect of research in the realm of science and management. (Walke et al., 2007; Karpagam et al., 2011). The open access publishing of output writers, as well as their contribution, may be seen in the table. 6

**Table.no.6 OPEN ACCESS HIGHEST CITATION**

| SR.NO | NAME OF THE AUTHOR | CITATION SCORE |
|---|---|---|
| 1 | Aitipamula, S et.al | 558 |
| 2 | Ravi, K et al | 523 |
| 3 | Saravanan, R et.al | 452 |
| 4 | Bolla, G; Nangia, A | 297 |
| 5 | Kirubasankar, B et al | 266 |

| | | |
|---|---|---|
| 6 | Alladi, S et al | 233 |
| 7 | Mondal, N et al | 219 |
| 8 | Shafi, S et al | 209 |
| 9 | Zhang, YH et al | 202 |
| 10 | Reddy, NJ et al | 196 |

Co-authorship analysis of Non-open through Vosviewers

Table 7 depicts the pattern of co-authorship. The CAI is by far the most effective approach to display the pattern of co-authorship in papers. As time goes on, the strength of co-author relationships implies an increase in multi-authorship trends. The vosviwers networking analysis can reveal the co-author relationship & collaboration. Co-authorship proposed framework can be understood through clusters, according to the network analysis. It is possible to see the whole strength of a authorship relationship with other authors.

**Table.no.7 Non-Open Access Co-Authorship Citation and Link Strength**

| Id | Author | Documents | Total Link Strength |
|---|---|---|---|
| 7608 | Pal, M | 139 | 593 |
| 9194 | Rao, Sv | 109 | 283 |
| 8967 | Rambabu, D | 40 | 234 |
| 7829 | Parsa, Kvl | 34 | 206 |
| 7301 | Nath, S | 16 | 190 |
| 8301 | Prasad, E | 19 | 189 |
| 7875 | Pathak, Ap | 55 | 183 |
| 4212 | Jhingan, A | 16 | 181 |
| 3139 | Gehlot, J | 15 | 176 |
| 10505 | Shamlath, A | 15 | 165 |
| 10233 | Satyanarayana, N | 60 | 161 |
| 5366 | Kumar, Ks | 36 | 158 |

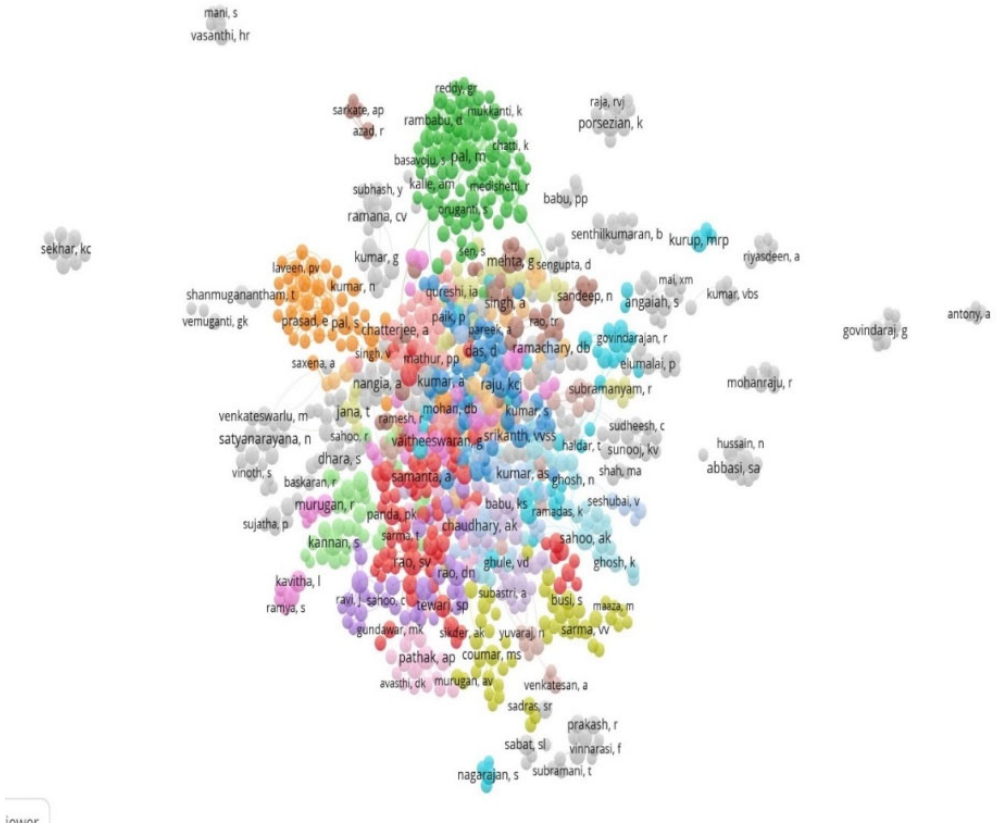



Figure No.3 Author and Co-Authorship network link strength and citation

The author with one of the most total links must be taken into account. We've chosen the top 15 publishers who have a strong co-authorship relationship. The collaboration coefficient (CC) is also another metric used to track how various authors collaborate over time. The value of the CC link increases over time, indicating that the publication's co-authorship is growing (Table 7). Various scientometrics studies in scientific research also show that Indian science research is becoming more collaborative locally and globally (Mulla, 2012). India's domestic & global collaborations in science research contributes to the academic impact of Indian writers' discoveries (Gupta et al., 2011).

Distribution based on Keyword of Non-open access

The keywords are indeed the particular terms used in the article to draw attention to the most important information to make it searchable. The VOS viewer map is shown in Figure 4 and the current study analyses the prevalence of regularly used author keywords. The size of the circle is related to the frequency with which a single keyword is used throughout all fields of research. The various patches of colour represent various sets of keywords that are commonly utilized in publications from prominent south Indian colleges. Nanoparticles, derivatives, performance, and behaviour are some of the most common keywords. Intra-association between keywords is represented by the thickness of both the network line. The stronger the bond, the thicker the line. For the keywords stated above, the lines is thicker (Figure 4).

**Table no.8 Keyword Occurrence and Total link strength**

| Id | Keyword | Occurrences | Total Link Strength |
|---|---|---|---|
| 22737 | Nanoparticles | 446 | 2515 |
| 9342 | Derivatives | 309 | 1348 |
| 25633 | Performance | 265 | 1303 |
| 3743 | Behavior | 253 | 1178 |
| 14867 | Growth | 274 | 1159 |
| 33903 | Temperature | 230 | 1062 |
| 8388 | Crystal-Structure | 200 | 892 |
| 12298 | Expression | 216 | 879 |
| 26135 | Photoluminescence | 139 | 831 |
| 9358 | Design | 194 | 751 |
| 20511 | Mechanism | 163 | 727 |
| 24380 | Optical-Properties | 137 | 704 |
| 6333 | Chemistry | 153 | 678 |

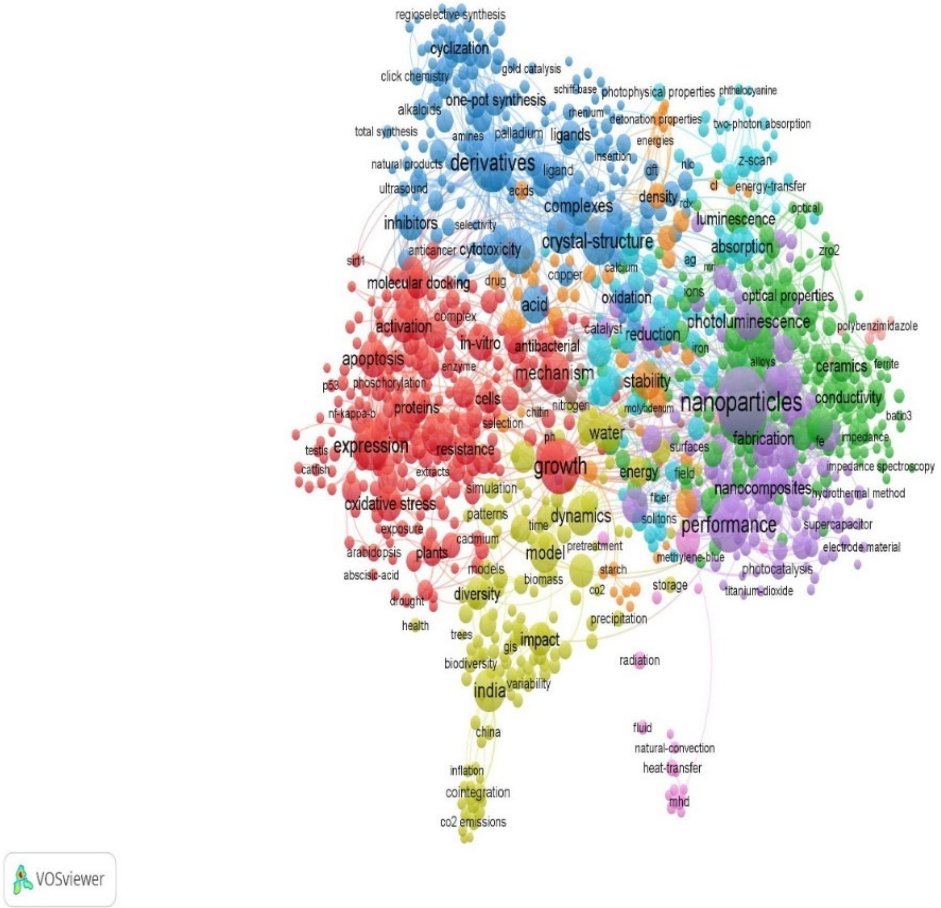



Figure No.4 Keyword Occurrence and Total link strength of open access

The total strength of link between the keywords used during various research articles is depicted in figure no.4. Among open articles collected in chosen south Indian universities, we have selected the best 15 keywords network strength, with expression having the strongest link, identification having the second strongest link, and protein having the third strongest link.

**Conclusion**:

The current study includes a scientometrics evaluation of papers published in all fields of research from the top 10 south Indian institutions between 2012 and 2021. The majority of the publications were in the form of articles, with a rising number of articles as time went on. The tendency in science research is to have multiple authors. As time goes on, the number of authors and collaborations has expanded.

The citation pattern follows general tendencies as well, for example, the number of references rises as the different authors rises, or multi-authored articles receive more citations. The majority of highly referenced papers came from the universities of Hyderabad and Pondicherry. In every subject of research, a few research authors have controlled the entire research publishing. In comparison to other publications, open access and transdisciplinary journals receive higher citations. The study's findings can be utilized to pinpoint specific field research locations where extra focus should be paid. Future research should concentrate on the open and closed access policies of Indian universities, with a particular focus on the northern states. Future research should include databases such as Scopus, PubMed, and others, as this work mainly focused on the web of science.

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# Theme 5

# Information Seeking Behavior and Open Access Sources

# Use of Online Resources by Engineering Students in COVID 19 Pandemic: A Study

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## ABSTRACT

*In this paper examined the usage of online resources in the COVID Lockdown period by the engineering students of Malla Reddy Institute of Technology & Science, Secunderabad. A well organized questionnaire was distributed to 200 UG engineering students to collect the key data from student respondents. A total number of 186 questionnaires were received presentationin general response rate of counterproductive to evaluate online library users. Majority of students using online resources daily three hour in Laptops, majority of students satisfy with on line resources.*

## INTRODUCTION

Engineering Education is essential and indispensable contribution for national development and for amplification the industry, economy and eventually bettering the quality of life of the people. The library is regarded as the 'vital centre of knowledge', the centre of intellectual life and the heart and soul of the any academic organization. This reflects that discoveries and developments are really generated in the library and consequently examine in the laboratory. It employs an significant place in the recent education system and subscribe and maintain the expensive educational resources of the academic institutions. The scholastic libraries are a place of collection of print and online sources for academic fertility to conduct their academics, research and revise their knowledge. In the system of education, an academic library is the centric part of academic cycle. An engineering institute library or any other institutional library of graduate level education exists to prop up the goals of its parent institute. Since university libraries are an integral part of the higher education system, they should provide support services for the

formal educational programs as well as for facilities for research and for generation of new knowledge. It is important for any information professional working in an academic library or any other library to know the real requirements of the user community, for establishing the proficient, successful and scientific development of information resources and services, the libraries need to be considered and developed systematically.

The explosion of the recent technologies, including, smart phones, tabs, and rapid internet speed, has changes the lives of persons in the worldwide. Engineering education has also transformed in the past decades to keeping pace with the varying technologies and availability and accebility of superior software and apps that offer professors and students a new perspective in understanding complex technical topics. The use of technology in engineering education had already been in practicing in developed countries around decades ago, yet its acceptance by the educators was lagging behind the learners. The present Covid-19 pandemic situation has increase speed the receipt of technology usage in engineering education to a new level. Not only the education and learning but the evaluation has been shifted online, a concept inconceivable some ten to fifteen years back. The revolution of social media like YouTube, Facebook, Twitter, Instagram, etc., has brought the world in the grasp of a small smart phone. The students now have access to the best graduates from the finest engineering institutes in the world. To one side from social media pedestals, focused engineering-related academic networks also came to the horizon in the past decade. These include IEEE, web of science, SCOPUS, Research Gate, Academia.edu, and other programs that also targeted engineering literature like Google scholars, Linked In, etc. The introduction of Wikipedia and YouTube as ancillary aid to engineering resources has shifted technical learning to a new knowledge.

OBJECTIVES OF THE STUDY

1. To study the use of online resources by the engineering students in the COVID 19 Pandemic.
2. To know the online access resources in the Period of COVID 19.
3. To know the frequency of using online resources in COVID Pandemic
4. To find out which type of online resources using in the lockdown period
5. To identify the most preferable online resources in pandemic period
6. To assess the satisfaction level of online resources in pandemic situation

## SCOPE AND LIMITATION OF THE STUDY

The scope of the study is confined only focused on student of Malla Reddy Institute of Technology and Science, Secunderabad, Telangana only.

## METHODOLOGY

This study is survey and questionnaire method was adopted and a total of 200 questionnaires were scattered to the students of various departments. However, 186 were established. This constitutes a response rate of about 93%. The data was analyzed and presented in the below following tables.

## DATA ANALYSIS AND INTERPRETATION

Table 1 : Gender wise Distribution

| Gender | Number | Percentage |
|---|---|---|
| Male | 124 | 66.67 |
| Female | 62 | 33.33 |

It is inferred from the Table 1 that out of 186 students who participated in the study (response rate = 93%), male students 124(66.67%) where asfemales were 62 (33.33%).

Table 2 : Department wise Distribution

| Department/Gender | Male | Female | Total |
|---|---|---|---|
| CSE | 43 (23.12) | 16 (8.60) | 59 (31.72) |
| ECE | 38 (20.48) | 19 (10.22) | 57 (30.65) |
| Civil | 19 (10.22) | 14(7.53) | 33 (17.74) |
| IT | 24 (12.90) | 13 (6.99) | 37 (19.89) |
| TOTAL | 124 (66.67) | 62 (33.33) | 186 (100) |

It is observed from table 2 most of the students 59(31.72%) were belongings to CSE Computer science and engineering branch, followed 57(30.65%) were ECE(Electronics and Communication engineering), 37(19.89%) were

IT(Information Technology), and 33(17.74%) were belongs to Civil Engineering branch were participated in the study.

Table 3 Age wise Distribution

| Age Group/Gender | Male | Female | Total |
|---|---|---|---|
| 17-19 Years | 47 (25.27) | 22 (11.83) | 69 (37.10) |
| 19 to 21 Years | 54 (29.03) | 24 (12.90) | 78 (41.94) |
| Above 21 years | 23 (12.37) | 16 (8.60) | 39 (20.97) |
| Total | 124 (66.67) | 62 (33.33) | 186 (100) |

It also observed from table 3 that greater part of the students, 78(41.94%), belong to the age group of 19-21 years, 69(37.10%) who are to the age group of 17–19 years, while 39(20.97%) in the age group of above 21 years.

Table 4: Frequency of Use Online Resources

| Time | Female | Male | Total | Chi Square | D.F | Significance |
|---|---|---|---|---|---|---|
| Less than one Hour | 14 (7.53) | 12 (6.45) | 26 (13.98) | 6.631 | 4 | 0.157 |
| One Hour | 28 (15.05) | 15 (8.06) | 43 (23.12) | | | |
| Two Hours | 29 (15.59) | 9 (4.84) | 38 (20.43) | | | |
| Three Hours | 44 (23.66) | 17 (9.14) | 61 (32.80) | | | |
| More than Three Hours | 9 (4.84) | 9 (4.84) | 18 (9.68) | | | |
| Total | 124 (66.67) | 62 (33.33) | 186 (100) | | | |

Table 4: summarized that when the frequency of using online resources in the COVID 19 Pandemic period, asked to students they gave the greatest percentage to everyday three hours 61(32.80%) that foreshow the students were using online resources as the part of lives for getting information, followed by daily one hour 43(23.12%), less than one hour daily 26(13.98%) and least they are using in more than three hours18(9.68%).It is also raveled that there is no significant relation between preference device to use online resources and gender which is greater p value.

Table 5: Mostly Preference Device to use online resources

| Device/Gender | Male | Female | Total | Chi Square | D.F | Significance |
|---|---|---|---|---|---|---|
| Laptop | 44 (23.66) | 23 (12.37) | 67 (36.02) | 0.147 | 3 | 0.986 |
| Tablet | 38 (20.43) | 19 (10.22) | 57 (30.65) | | | |
| Mobile | 30 (16.13) | 15 (8.06) | 45 (24.19) | | | |
| Others | 12 (6.45) | 5 (2.69) | 17 (9.14) | | | |
| TOTAL | 124 (66.67) | 62 (33.33) | 186 (100) | | | |

It is observed from table 5 that as expected majority of students 67(36.02%) were using laptops for accessing online resources in the COVID 19 Pandemic period for gaining required knowledge, followed by 57(30.65%) were using tablet, 45(24.19%) were using mobile phone for searching required data and least 17(9.14%) were using other devices like PCs for getting their required information in the COVID 19 pandemic period.

There is no significant relation between preference device to use online resources and gender which is greater p value.

Table 6: Channel of get the information about the access of online resources?

| Source | Male | Female | Total |
|---|---|---|---|
| Teachers | 32 (17.20) | 13 (6.99) | 45 (24.19) |
| Seniors | 14 (7.53) | 16 (8.60) | 30 (16.13) |
| Social media | 14 (7.53) | 9 (4.84) | 23 (12.37) |
| Library website | 64 (34.41) | 24 (12.90) | 88 (47.31) |
| Total | 124 (66.67) | 62 (33.33) | 186 (100) |

From the table 6 it is pragmatic that majority of students88(47.31%) were getting on line resource s from their college library website, followed 45(24.19%) from their professors, 30(16.13%) from their senior students, only 23(12.37%) get the information from social media in the pandemic period for their academic purpose.

Table 7: Time Spending in the Lockdown Period

| Activity | Male | Female | TOTAL | Chi Square | D.F | Signif-icance |
|---|---|---|---|---|---|---|
| Watching TV | 98 (52.69) | 43 (23.12) | 141 (75.81) | 40.918 | 7 | 0 |
| Discussion with Friends | 79 (42.47) | 38 (20.43) | 117 (62.90) | | | |
| Reading Subject Books | 64 (34.41) | 42 (22.58) | 106 (56.99) | | | |
| Review Online Resources | 24 (12.90) | 28 (15.05) | 52 (27.96) | | | |
| Plying with children | 45 (24.19) | 42 (22.58) | 87 (46.77) | | | |
| Sleeping | 68 (36.56) | 39 (20.97) | 107 (57.53) | | | |
| Enroll online courses | 24 (12.90) | 29 (15.59) | 53 (28.49) | | | |
| Playing mobile games | 77 (41.40) | 14 (7.53) | 91 (48.92) | | | |
| Total | 124 (66.67) | 62 (33.33) | 186 (100) | | | |

(Multiple Answers were permitted)

It is clearly noticed from above table majority of students 141(75.81%) engage the day in the Pandemic period with watching TV, followed by 117(62.90%) Discussion with Friends, 107(57.53%) were time spent with sleeping, 106(56.99%) were reading subject books, 91(48.92%) were playing mobile games, 87(46.77%) were playing with children, 53(28.49%) were utilize their time to enroll online courses, only 52(27.96%) were spending time with review online resources.

There is a significant relation between time spending in the pandemic period and gender which is lesser p value.

Table 8: Is online resources more useful than the traditional textbooks?

| Yes/No | Male | Female | Total |
|---|---|---|---|
| YES | 64 (34.41) | 32 (17.20) | 96 (51.61) |
| NO | 60 (16.13) | 30 (16.13) | 90 (48.39) |
| Total | 124 (66.67) | 62 (33.33) | 186 (100) |

It is noticed from table 8 that half of the students were feel online resources are more use full than traditional text books in the COVID Pandemic Period.

Table 9 Most frequently Using online Resources

| Resources | Male | Female | Total | Chi Square | D.F | Significance |
|---|---|---|---|---|---|---|
| IEEE | 95 (5108) | 48 (25.81) | 143 (76.88) | 6.749 | 7 | 455 |
| K-Hub | 82 (4409) | 54 (29.03) | 136 (73.12) | | | |
| N-LIST | 114 (61.29) | 58 (31.18) | 172 (92.47) | | | |
| DELNET | 79 (42.47) | 44 (23.66) | 123 (66.13) | | | |
| J-GATE | 98 (52.69) | 34 (18.28) | 132 (70.97) | | | |
| NDL | 84 (45.16) | 39 (20.97) | 123 (66.13) | | | |
| NPTEL(College Data Share) | 79 (42.47) | 45 (24.19) | 124 (66.67) | | | |
| OTHERS | 54 (29.03) | 27 (14.52) | 81 (43.55) | | | |
| Total | 124 (66.67) | 62 (33.33) | 186 (100) | | | |

(Multiple Answers were permitted)

From the table 9 we can find the most frequently using online databases provided by the Library in the COVID Pandemic Period, it is clearly known that majority of students 172(92.47%) using N- List Database for their academic purpose in the COVID lockdown period, followed 143(76.88%) using IEEE Database, 136(73.12%) using K-Hub Database, 132(70.97%) Using J-gate Database, 124(66.67%) Using NPTEL which are available in College Data share, 123(66.13%) of students using both DELNET and NPTEL, and Least 81(43.55%) were using Other Databases like Open Sources databases in the COVID 19 Pandemic Period.

Table 10: More frequently consult resources for your studies

| Resources | Male | Female | Total | Chi Square | D.F | Significance |
|---|---|---|---|---|---|---|
| Lecture PPT | 84 (45.16) | 54 (29.03) | 138 (74.19) | 4.999 | 4 | 0.287 |
| NPTEL | 98 (52.69) | 48 (25.81) | 146 (78.49) | | | |
| E- Journals | 74 (39.78) | 39 (20.97) | 113 (60.75) | | | |
| E- Books | 65 (34.95) | 50 (26.88) | 115 (61.83) | | | |
| Lecture Videos | 120 (64.52) | 58 (31.18) | 178 (95.70) | | | |
| Total | 124 (66.67) | 62 (33.33) | 186 (100) | | | |

(Multiple Answers were permitted)

Table 10: depict the practices of various online resources as recognized by the engineering students. The majority of them 178(95.70%) followed lecture videos prepared by professors of institutes, 146(78.49%) preferred to consult NPTEL lectures delivered by the IITS and NIT Professors, while 138(74.19%) searched online lecture PPTs for their studies, whereas115(61.83%) consulting e- textbooks, 113(60.75%) consulting e- Journals was the least preferred method only.

There is no significant relation among using resources in the pandemic period and gender which is greater p value.

Table 11: Level of satisfaction in the Pandemic while using online resources

| Level | Male | Female | Total | Chi Square | D.F | Significance |
|---|---|---|---|---|---|---|
| Dissatisfied | 5 (2.69) | 3 (1.61) | 8 (1.30) | 11.659 | 4 | 0.02 |
| Neither satisfied nor dissatisfied | 7 (3.76) | 9 (4.84) | 16 (8.60) | | | |
| Satisfied | 18 (9.68) | 17 (9.14) | 35 (18.82) | | | |
| Very dissatisfied | 2 (1.08) | 2 (1.08) | 4 (2.15) | | | |
| Very satisfied | 92 (49.46) | 31 (16.67) | 123 (66.13) | | | |
| Total | 124 (66.67) | 62 (33.33) | 186 (100) | | | |

The student were asked about the satisfaction level of using online resources in the Period of COVID 19, it was raveled that majority 123 (66.13%) were very satisfied, 35(18.82%) were satisfied, 16(8.60%) were neither satisfied nor dissatisfied, 8(1.30%) were dissatisfied, only 4(2.15%) were very dissatisfied with on line resources while using in the COVID 19 Pandemic period.

There is significant relation between satisfaction level and gender which is greater p value.

FINDINGS

- 66.67% of Respondents were Male students
- Major part of participated students belonging to CSE Department
- Most of the students, 78(41.94%), belonged to the age group of 19-21 years
- Greatest percentage to everyday three hours 61(32.80%) that foreshow the students were using online resources
- Majority of students 67(36.02%) were using laptops for accessing online resources in the COVID 19 Pandemic Time
- Majority of students 88(47.31%) were getting on line resource s from their college library website
- More than 75% of students engage the day in the Pandemic period with watching TV
- Half of the students were feel online resources are more use full than traditional text books

- Almost all students using N-List Database
- 95.70%of students followed lecture videos prepared by professors of institutes
- 66.13% were very satisfied with online resources

## CONCLUSION

In the present situation informal community has had an effect in all circles of life, for example instruction, business, industry, and so forth. In actuality, the correspondence framework has been changed drastically. The long range informal communication instruments are an online stage where individuals can liberally make an individual record and speak with their family, companions, cohorts, educators, and so forth starting with one corner then onto the next corner over the World. Such extraordinary highlights have a person to person communication destination which give a database of clients, so individuals can discover their companions, structure networks, examines and interface with other people who share comparative interests with them. In any case, the present examination is to discover the effect of informal organizations for scholarly purposes among the building and drug store understudies of the Malla Reddy Institute of Technology & Science, Secunderabad. The discoveries show that most of the members having excellent information about different online resources. The respondents generally favored college library website. Larger parts of understudies utilize informal organization consistently in their home with Laptops. Aside from this essentially impart just as for partner with companions purposes.

The accompanying proposals are made in accordance with the discoveries of this examination

- Academic libraries should nag innovative work of their parent foundation and devise methods for producing capacity to guarantee conveyance of library administrations.
- Educational libraries necessity recovers its framework, i.e., influence supply; ICT offices and Internet association with satisfy worldwide guideline to empower viable usage of Social Network for administration conveyance.
- Adoption and utilization of possess interpersonal organization in scholastic libraries ought to be energized.
- Digital library Librarians ought to make mindfulness about the possibilities of Social system in scholastic libraries' administration conveyance.

- Librarian needs to investigate more highlights in Social Network, particularly square presenting of data on numerous library clients.
- There ought to be standard preparing and retraining of administrators to obtain significant expertise and commonality in using online resources for conveyance of library administrations.
- A staged methodology of coordinating Social Network as media of data spread and conveyance of administrations to clients in scholastic libraries ought to be received.

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# Utilization of E-Journals by the Faculty Members of SRM IST-Chennai

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## ABSTRACT

*The world is fast enough, moving towards technology that is faster and advanced. This advanced technology has changed the way of collecting information in Libraries.Electronic journal is also one such thing that the growth of e-journals was remarkable for librarians to serve better resources to enhance Research, Teaching & Learning. This paper demonstrates how the e-journals are useful and their impact on Research &Teaching and learning at SRMIST. A structured questionnaire was prepared and distributed, and data gathered, analyzed, and discussed according to the study's objectives. And it was found that the majority of the respondents are aware and make Use of E-Journals*.

## Keywords:

## Introduction:

An electronic journal is a periodical publication that is published in electronic format, usually on the Internet. An e-journal is an essential part of every library collection. Electronic journals are often referred to interchangeably as "electronic serials", online journals" and "electronic periodicals". The electronic journal can be described as Journals that are prepared,distributed, or accessed electronically.

### Category of e-journals are

1.CD-ROM Journals,

2.Networked E-Journals,

3.Online journals

**CD-ROM Journals - "**These are full-text journals published and distributed in the form of CD-ROM with regular updates,along with software to access and print. These are mainly electronic versions of printed journals".

**Networked Journals- "**These are electronic journals available over networks, such as the Internet, BITNET, or other commercial systems. Examples are e-newsletters, e-discussion lists, un-moderated bulletin boards",

**Online journals-** Online journals are paid journals as cost –per-access basic. Via online hosts as STN using proprietary retrieval software. These online journals are accessed to limit. "Online databases provide access to a large number of bibliographic and full-text journals. Such databases have been found very useful for providing various types of library services. Electronic serials may be defined very broadly as any journal, magazine, e-zine, webzine, newsletter or type of electronic serial publication that is available over the Internet. Within this broad definition, the titles can be electronically accessed using different technologies such as the World Wide Web (WWW), gopher, FTP, telnet, email, or listserv. Of course, virtually all modern electronic journals are mostly available via the Web. This site primarily includes e-journal sites as the publisher offers them. In general, this site excludes e-journals that are embedded within aggregators (such as Northern Light, EBSCO, Bell & Howell ProQuest, Information Access Company, and others)".

## About SRMIST Central Library

SRM Institute of Science and Technology (formerly known as SRM University) has an excellent library for the benefit of students, faculties, and researchers. "As one of the best-established libraries, according to International Standards, the University Library has an extensive collection of books covering various branches of Engineering and Technology, Medical and Health Sciences and Science and Humanities and its related fields. The library is nearly three decades old. It is fully Air Conditioned and automated with RFID (Radio Frequency Identification) technology". The library is well Protected with fire alarms and CCTV security systems.

## Objectives:

The main objectives of the studies are given below,

- To find out the frequency of Useof E-Journals by the faculty members
- To find out the awareness of e-journals

- To know the opinion and Satisfaction of the E-Journals services
- To identify the extent of dependency on the usage of electronic resources by the faculty members

## Methodology:

The survey method has been used for the study. A comprehensive questionnaire was prepared to collect data from the faculty members of SRMIST, observance of the research's primary objectives of the study. And analyzed through a simple analysis method. A total of 150 questionnaires was distributed, out of which 140 questionnaires were received with dully filled in. The study is restricted only to the faculty members of SRM Institute of Science & Technology, Katankulathur Campus.

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Table 1: **Gender wiseResponse to Questionnaire**

| S.No | Category of Faculty | Male | Female | Total | % |
|---|---|---|---|---|---|
| 1 | Professor | 7 | 4 | 11 | 7.86 |
| 2 | Associate Professor | 15 | 10 | 25 | 17.86 |
| 3 | Assistant Professor (SG) | 26 | 15 | 41 | 29.29 |
| 4 | Assistant Professor (OG) | 33 | 30 | 63 | 45.00 |
| | **Total** | **81** | **59** | **140** | **100.00** |

Table 1 shows the category of the user and genderwise distribution of the respondents. The respondents classified as a Professor, Associate Professor. Asst. Professor (SG), and Asst Professor (OG). The respondents' response rate was good out of 150; we received 140 of them as valid, and the male respondents as81 of them, and 59 are female.

**Table 2:** Awareness about of e-Journals

| Awareness about e-Journal | Designation | | | | | | | | Total | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | Professor N=11 | | Associate Professor N=25 | | Assistant Professor (SG) N=41 | | Assistant Professor (OG) N=63 | | Male N=81 | Female N=59 | Total Percentage N=140 |
| | Male | Female | Male | Female | Male | Female | Male | Female | | | |
| Yes | 7 | 4 | 15 | 9 | 24 | 14 | 31 | 25 | 77(95%) | 52(88.1%) | 129(92%) |
| No | 0 | 0 | 0 | 1 | 2 | 1 | 2 | 5 | 4(5%) | 7(11.9%) | 11(8%) |
| Total | **7** | **4** | **15** | **10** | **26** | **15** | **33** | **30** | **81(100%)** | **59(100%)** | **140(100%)** |

Table 2 reveals the awareness of e-journals among the faculty members. The analysis shows that respondents (95%) of males were well aware of E-Journals available at SRMIST, and females (88%) are aware. Only (8%) were not familiar in total. Totally 92% of respondents were well aware of using E-Journals available at SRMIST central library.

**Table.3 Place of accessing e-journals**

| Sl. No | Place of access | Designation | | | | | | | | Total | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Professor N=11 | | Associate Professor N=25 | | Assistant Professor(SG) N=41 | | Assistant Professor(OG) N=63 | | Male N=81 | Female N=59 |
| | | Male | Female | Male | Female | Male | Female | Male | Female | | |
| 1 | Digital Library | 1 | 1 | 3 | 2 | 15 | 7 | 23 | 18 | 42(52%) | 28(47%) |
| 2 | Laboratory | 2 | 1 | 5 | 3 | 4 | 5 | 6 | 7 | 17(21%) | 16(29%) |
| 3 | Department | 4 | 2 | 7 | 5 | 7 | 3 | 4 | 5 | 22(27%) | 15(24%) |
| | **Total** | **7** | **4** | **15** | **10** | **26** | **15** | **33** | **30** | **81(100%)** | **59(100%)** |

Table 3 indicates the place of accessing e-journals at SRMIST. The usage level of E-Journals is more in the Digital Library (47%) than Lab(29%) and Department (24%). The Digital Library plays a prominent role in accessing E-

Journals and convenient place for the faculty members to use the E-Journals. The finding shows the majority of respondents are accessing e-journals from digital libraries.

**Table4** Frequency of accessing e-journal

| S. No | Name of the e-journals Database | Designation | | | | | | | | | | | | Total N=140 | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Professor N=11 | | | Associate Professor N=25 | | | Assistant Professor (SG) N=41 | | | Assistant Professor(OG) N=63 | | | | | |
| | | R | S | N | R | S | N | R | S | N | R | S | N | R | S | N |
| 1 | IEL Online(IEEE & IEE) | 10 | 1 | 0 | 20 | 4 | 1 | 31 | 10 | 0 | 49 | 13 | 1 | 110 (78%) | 28 (20%) | 2 (2%) |
| 2 | ACM (Association of Computing Machinery) | 7 | 3 | 1 | 11 | 12 | 2 | 16 | 21 | 4 | 31 | 32 | 0 | 65 (46%) | 68 (48%) | 7 (6%) |
| 3 | ASCE (American Society for Civil Engineering) | 6 | 4 | 1 | 9 | 13 | 3 | 14 | 18 | 9 | 25 | 36 | 2 | 54 (38%) | 71 (50%) | 15 (12%) |
| 4 | ASME( American Society for Mechanical Engineering) | 4 | 5 | 2 | 8 | 12 | 5 | 11 | 20 | 10 | 14 | 44 | 5 | 37 (26%) | 81 (58%) | 22 (16%) |
| 5 | Science Direct | 9 | 1 | 1 | 18 | 6 | 1 | 29 | 11 | 1 | 41 | 20 | 2 | 97 (69%) | 38 (27%) | 5 (4%) |
| 6 | Springer Link | 8 | 2 | 1 | 16 | 8 | 1 | 21 | 18 | 2 | 26 | 31 | 6 | 71 (50%) | 59 (42%) | 10 (8%) |
| 7 | Nature | 5 | 4 | 2 | 9 | 11 | 5 | 15 | 21 | 5 | 15 | 41 | 7 | 44 (31%) | 77 (55%) | 19 (14%) |
| 8 | SAE Digital Library | 2 | 6 | 3 | 8 | 12 | 5 | 5 | 15 | 21 | 7 | 15 | 41 | 22 (16%) | 48 (34%) | 70 (50%) |
| 9 | ProQuest | 3 | 6 | 2 | 5 | 12 | 5 | 19 | 20 | 5 | 7 | 41 | 15 | 34 (24%) | 79 (57%) | 27 (19%) |
| 10 | Emerald Publishing | 6 | 3 | 2 | 12 | 8 | 5 | 21 | 15 | 5 | 15 | 41 | 7 | 54 38% | 67 48% | 19 14% |
| R - Regularly | | S - Sometimes | | | | | | | | | N - Never | | | | | |

Table 4 describes the Usability of e-Journals at SRMIST by the faculty members. About 78% of respondents access IEL as regular usage. The second high regular usage was science direct of 69%. The rest shares as, Springer link 50%, ACM 46%, ASCE 38%, Nature 31% . The SAE Digital Library is the least usage of 16% in SRMIST. The conclusion from the table 5 clearly shows that IEL online resource is regularly more usage by faculty members.

**Table 5** Purpose of Using E-Journals

| **Purpose** | **Professor N=11** | | **Associate Professor N=25** | | **Assistant Professor(SG) N=41** | | **Assistant Professor(OG) N=63** | | **Total N=140** |
|---|---|---|---|---|---|---|---|---|---|
| | Male | Female | Male | Female | Male | Female | Male | Female | |
| Research Purpose | 1 | 1 | 2 | 1 | 6 | 3 | 15 | 12 | 41(30%) |
| Teaching Purpose | 2 | 1 | 4 | 1 | 9 | 5 | 7 | 5 | 34(24%) |
| Preparing assignment | 1 | 1 | 3 | 3 | 2 | 3 | 4 | 5 | 22(16%) |
| Publishing article | 2 | 1 | 5 | 3 | 6 | 3 | 5 | 5 | 30(21%) |
| Keeping up-date subject information | 1 | 0 | 1 | 2 | 3 | 1 | 2 | 3 | 13(9%) |
| **Total** | **7** | **4** | **15** | **10** | **26** | **15** | **33** | **30** | **140(100 %)** |

Table 5 indicates the purpose of using e-journals. The faculty members of 41% use e-journals for Research purposes and 34% use them for teaching purposes. About 30% of faculty members use e-journals for Publishing articles. And 22% of faculty use for preparing assignments, and 13% of faculty use for keeping updated subject information. The analysis shows most of the faculty members use e-journals for research purposes only.

**Table 6** User opinion about accessing e-journals

| User Opinion | Professor | | Associate Professor | | Assistant Professor(SG) | | Assistant Professor(OG) | | Total |
|---|---|---|---|---|---|---|---|---|---|
| | Male | Female | Male | Female | Male | Female | Male | Female | |
| Excellent | 2 | 2 | 8 | 4 | 18 | 9 | 19 | 20 | 82 (59%) |
| Very Good | 3 | 2 | 3 | 2 | 3 | 2 | 7 | 3 | 25 (18%) |
| Good | 1 | 0 | 3 | 2 | 2 | 3 | 4 | 3 | 18 (12%) |
| Average | 1 | 0 | 1 | 2 | 3 | 1 | 3 | 4 | 15 (11%) |
| **Total** | **7** | **4** | **15** | **10** | **26** | **15** | **33** | **30** | **140(100%)** |

Table 6 reveals the user opinion about E-Journals at SRMIST . 59% of faculty were satisfied with excellent while accessing available e-Journals in SRM. About 18% of faculty members' view was very good about accessing e-journals; only 11% of faculty members' opinion was the average. so overall, faculty members' opinion about accessing e-journals was Excellent.

## Discussion

The study has shown that the utilization of e-journals provided by SRMIST central library plays an increasingly important role in research at SRMIST. Not only the current e-journals required .the respondents need to offer back issues as well. An electronic resource has acquired global currency with the changing paradigm of the educational horizon. Better and more reliable information processing with the new equipment and modern library technology and facilities will be more feasible. Only when a supporting and enabling ecosystem is built for users will the advantages of e-resources be reaped.

## Conclusion

In the current period, e-resources and facilities seem to be regarded as quite important. Library facilities and e-resources play a significant role in the operation of every academic institution and federal buildings. It is essential to leverage and adequately use these e-resources and services. An educational organization's

sustainability depends primarily on the usefulness of its e-resources and assistance about the society it represents**.**

The above study shows that E-Journals at SRMIST play a significant role for the faculty members in Research, Teaching & Learning. "The digital library of SRMIST is well equipped for users with WiFi and high-speed Internet connection so that the usage of the print version of Journals is less when compared to E-Journals. The central Library of SRM shows maximum effort for the users to give Exact and current information in the digital world. Nowadays, E-Journal plays an essential role in disseminating the latest news in various fields, especially in the 21st century. That SRM is the only library that fulfills the user needs".

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# Use of ICT based Library Resources and Services: A Case Study of Government Degree Colleges affiliated to Rayalaseema University

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## Abstract

*Information and Communication Technology (ICT) has transformed library services globally. Most current information are recorded in electronic format, ICT has also contributed immensely to the performance of librarians in the discharge of their duties such as in cataloguing, reference services, circulation management, serials control etc. This paper focuses on the use of ICT based library resources and services by the users of Degree College libraries affiliated to Rayalaseema University, Kurnool. Data was collected through a questionnaire from 522teaching staff and students of various branches of degree courses. The population includes final year UG students, PG students and Teaching Staff. The current study highlights the users'competency in computer literacy, how open resources are useful which are available on internet and impact of ICT on their studies. The study found that nearly half (46.6%) of the respondents were not satisfied with ICT based library services provided by their college libraries. The study suggested that for the optimum utilization of e-journals, consortia's and various other ICT based resources and services; the concerned authorities should allocate sufficient funds to provide ICT facilities and services to the library users towards getting latest information or documents by the faculty members and students.*

Keywords: *Information and communication technology, e-resources, academic libraries, facilities, resources and services*

## Introduction

According to the UNESCO the term "Information and Communication Technology" refers to forms of technology that are used to transmit, process, store, create, display, share or exchange information by electronic means. This broad definition of ICT includes such technologies as radio, television, video, DVD, telephone (both fixed line and mobile phone), satellite systems, and computer and network hardware and software, as well as the equipment and services associated with these technologies, such as videoconferencing, e-mail and blogs. Although there are many definitions of ICT by experts, the main point is that ICT is a technologies that can help people to communicate in real-time with others in different countries using technology such as instant messaging, Voice Over IP (VoIP), and video-conferencing. Social networking website like Facebook allows users from all over the world to remain in contact and communicate on a regular basis. Library and information centres have been using ICT based resources and services to satisfy the diverse information needs of their users.

However, these resources and services are not fully utilized. Underutilization of these resources and services has been a cause of concern to librarians worldwide. The use of ICT has become increasingly important in academic and special libraries as libraries are switching over to ICT based resources and services at an accelerated pace. It has opened new avenues, like online learning, e-education, e-journal, CD-ROM Database, e-books, web based resources etc.

## Objectives of the Study

The objectives of the study are as under:

1. To know the level of competency in computer literacy among the students and teaching staff in government degree colleges.
2. To assess the quality of ICT based modern library services
3. To investigate the opinions about electronic learning resources
4. To examine impact of ICT on user studies
5. To determine the frequency in use of electronic resources
6. To identify the facing the problems while using ICT based library services

7. To look at the getting help from librarians by library user while using ICT based activities.
8. To find out the satisfaction on ICT based library services provided by their college libraries

## Limitations of the study

At present there are 14government degree colleges offered different courses to the students in the study area. The researcher covered all colleges for the study. Final year students can judge better than the second and first year students to get their required information with the available information sources and consult in their information seeking process. Keeping this in view the investigator has selected final year UG and PG students and staff in the Government Degree Colleges affiliated to Rayalaseema University, Kurnool Andhra Pradesh (A.P).

## Methodology

According to annual reports of Government degree colleges affiliated to Rayalaseema University, there are 2816 UG, PG Final year students and teaching staff in the population of 14 degree college libraries. Out of them, 2435 are UG and PG students and 381 teaching staff. As all these members use their respective libraries, they are considered as total users of all degree college libraries. As the population is large, in terms of cost, time and labour involved, the investigator selected a sample of 500 students and 114 teaching staff by using convenient sampling method. Among them, 413 (82.6%) students and 109 (95.61%) teaching staff responses were received. The data relating to sample, questionnaire distributed and received are presented in the below Table.

**Distribution of the Students, teaching Staff and Questionnaires distributed and received in degree colleges**

| S.No | Name of the College | Place | Total | | No. of Questionnaires distributed | | No. of Questionnaires received | |
|---|---|---|---|---|---|---|---|---|
| | | | Students | Staff | Students | Staff | Students | Staff |
| **Government Degree Colleges** | | | | | | | | |
| 1 | K.V.R. Govt. Degree College (W) | Kurnool | 400 | 60 | 60 | 15 | 45 | 15 |
| 2 | PSC & KVSC Govt. Degree College | Nandyal | 350 | 30 | 40 | 10 | 36 | 10 |
| 3 | Government Degree College (Men) | Kurnool | 250 | 40 | 50 | 10 | 45 | 8 |
| 4 | Silver Jubliee Government Degree College | Kurnool | 206 | 35 | 50 | 8 | 40 | 6 |
| 5 | GVRS Government Degree College | Dhone | 60 | 11 | 15 | 5 | 12 | 5 |
| 6 | S.V.B. Govt. Degree College | Koilakuntla | 145 | 14 | 40 | 6 | 35 | 6 |
| 7 | SML Govt. Degree College | Yemmiganur | 175 | 23 | 30 | 5 | 25 | 5 |
| 8 | Government Degree College | Nandikotkur | 68 | 20 | 25 | 6 | 18 | 6 |
| 9 | Government Degree College | Alur | 108 | 25 | 35 | 6 | 28 | 6 |
| 10 | Government Degree College | Pathikonda | 180 | 30 | 40 | 10 | 35 | 10 |
| 11 | Government Degree College | Banaganapalli | 175 | 28 | 50 | 8 | 40 | 8 |
| 12 | Government Degree College | Srisailam | 78 | 26 | 20 | 8 | 15 | 7 |
| 13 | Government Degree College | Atmakur | 150 | 17 | 30 | 8 | 26 | 8 |
| 14 | SGTRM Government Degree College | Yerraguntla | 90 | 22 | 15 | 9 | 13 | 9 |
| **Total** | | | **2435** | **381** | **500** | **114** | **413** | **109** |

## Analysis and Interpretation

Application of ICT in Indian college libraries has not reached a very high level. Lack of budget, lack of manpower, lack of skilled staff and lack of training are the main constraints for not automating library activities. The following analysis and interpretation of the data have shown the necessity of the application of ICT in college libraries.

**Table 1: Stream of the Users**

| Frequency | Government | | Total |
|---|---|---|---|
| | Students | Teaching Staff | |
| Arts/Humanities | 124 (30.0) | 30 (27.5) | 154 (29.51) |
| Commerce | 203 (49.2) | 61 (56.0) | 264 (50.57) |
| Science | 86 (20.8) | 18 (16.5) | 104 (19.92) |
| **Total** | **413 (100.0)** | **109 (100.0)** | **522 (100.0)** |

Note: Numbers in parentheses indicate percentages

It is evident from the Table 1 that more than half (50.57%) of the respondents were belongs to commerce stream, followed by 29.51 per cent of the respondents were from Arts/Humanities stream and remaining 19.92 per cent of the teaching were from science stream. It is clear from the table that majority (56% ) of the teaching staff and 49 per cent students are belongs to commerce stream, followed by 27.5 per cent of the teaching staff and 30 percent the students were from Arts/Humanities stream and remaining 16.5% of the teaching staff and 20.8 per cent of the students were from science stream. It can be concluded that majority of the teaching staff and students are belongs to commerce stream.

**Table 2: Level of competency in computer literacy**

| Level of Competency | Government | | Total |
|---|---|---|---|
| | Students | Teaching Staff | |
| Beginner | 74 (17.9) | 10 (9.2) | 84 (16.09) |
| Average | 185 (44.8) | 47 (43.1) | 232 (44.44) |
| Expert | 35 (8.5) | 12 (11.0) | 47 (9.00) |
| No Response | 119 (28.8) | 40 (36.7) | 159 (30.47) |
| **Total** | **413 (100.0)** | **109 (100.0)** | **522 (100.0)** |

Note: Numbers in parentheses indicate percentages

It can be observed from the Table 2 that nearly half (44.44%) of the respondents were average in competency in their computer literacy followed by30.47 per cent not assigned any response, 16.09 per cent mentioned beginner and remaining 9 percent of the respondents stated they have expert computer literacy skills. It was also obvious from the table that majority (43.1%) of the teaching staff are average in their level of competency in computer literacy, followed by no response (36.7%), expert (11%) and remaining 9.2 per cent of the teaching staff mentioned they were beginners in competency of computer literacy. It was clear from the table that majority (44.8%) of the students are average in their level of competency in computer literacy, followed by no response (28.8%), beginner (17.9%) and remaining 8.5 per cent of the students mentioned they were experts in competency of computer literacy. It can be concluded that majority of the teaching staff and students are average in their level of competency in computer literacy.

**Table 3:** Importance of computer literacy to use Internet/electronic resources

| Importance | Government | | Total |
|---|---|---|---|
| | Students | Teaching Staff | |
| Highly Important | 304 (73.6) | 75 (68.8) | 379 (72.61) |
| Important | 80 (19.4) | 24 (22.0) | 104 (19.92) |
| Less Important | 0 (0.0) | 0 (0.0) | 0 (0.0) |
| No Response | 29 (7.0) | 10 (9.2) | 39 (7.47) |
| **Total** | **413 (100.0)** | **109 (100.0)** | **522 (100.0)** |

Note: Numbers in parentheses indicate percentages

It is evident from the Table 3 that majority (72.61%) of the teaching staff and the students are opined that computer literacy is highly important for utilizing the electronic resources in the library followed by 19.92 per cent of the respondent's opined computer literacy is important and remaining 7.47 per cent of the respondents were not responded. It can be concluded that majority of the teaching staff and students are opined that computer literacy is highly important to utilize the electronic resources in the library.

**Table 4:**Opinion on Open Resources available on Internet

| Opinion | Government | | Total |
|---|---|---|---|
| | Students | Teaching Staff | |
| Highly Useful | 60 (14.5) | 45 (41.3) | 105 (20.12) |
| Useful | 245 (59.3) | 27 (24.8) | 272 (52.11) |
| Not Useful | 108 (26.2) | 37 (33.9) | 145 (27.77) |
| **Total** | **413 (100.0)** | **109 (100.0)** | **522 (100.0)** |

Note: Numbers in parentheses indicate percentages

It is evident from the Table 4 that more than half (52.11%) of the teaching staff and students are opined open resources are useful which are available on internet, followed by 27.77 per cent of the teaching staff and students mentioned not useful and remaining 20.12 per cent of the respondents were opined highly useful. It can be concluded that more than half of the teaching staff and students are opined open resources are useful which are available on internet.

**Table 5:** Providing ICT Based Modern Library Services

| Type of ICT Based Modern Library Services | Government (N=522) | | |
|---|---|---|---|
| | Yes | No | Don't Know |
| OPAC (LAN based) | 0 (0.0) | 0 (0.0) | 340 (65.1) |
| Web OPAC | 0 (0.0) | 0 (0.0) | 190 (36.4) |
| Database Search Service | 0 (0.0) | 0 (0.0) | 117 (22.4) |
| Internet Access | 140 (26.8) | 177 (33.9) | 75 (14.4) |
| Access to web resources | 402 (77.0) | 55 (10.5) | 60 (11.5) |
| Library Website | 0 (0.0) | 0 (0.0) | 0 (0.0) |

Note: Numbers in parentheses indicate percentages

It is observed from the Table 5 that majority (77%) of the respondents are opined that access to web resources are providing by their libraries. However, 65.1 per cent of the respondents not aware about OPAC (LAN based) followed by Web OPAC (36.4%), database search service (22.4%), Internet access (14.4%) and 11.5 per cent of the respondents also not aware on access to web resources. All respondents were not responded with regard to library website service. It can be concluded that most of the teaching staff and students are getting access to web resources.

**Table 6:** Opinion about Electronic Learning Resources

| Electronic Learning Resources | Government (N=522) | | | | | WS | WAM Score (N=522) | Rank |
|---|---|---|---|---|---|---|---|---|
| | Very Good | Good | Uncertain | Poor | Very poor | | | |
| Audio-Visual Materials | 50 (9.6) | 114 (21.8) | 200 (38.3) | 78 (14.9) | 80 (15.3) | 1542 | 2.95 | 5 |
| CD ROM Databases | 66 (12.6) | 45 (8.6) | 250 (47.9) | 161 (30.8) | 0 (0.0) | 1582 | 3.03 | 3 |
| On Line Databases | 0 (0.0) | 120 (23.0) | 322 (61.7) | 80 (15.3) | 0 (0.0) | 1606 | 3.08 | 2 |
| Electronic Journals | 0 (0.0) | 170 (32.6) | 122 (23.4) | 230 (44.1) | 00 (0.0) | 1506 | 2.89 | 6 |
| Electronic Books | 80 (15.3) | 197 (37.7) | 165 (31.6) | 80 (15.3) | 00 (0.0) | 1843 | 3.53 | 1 |
| E-thesis and Dissertation | 0 (0.0) | 0 (0.0) | 522 (100.0) | 0 (0.0) | 00 (0.0) | 1566 | 3.00 | 4 |
| Microfilm/Microfiche | 0 (0.0) | 0 (0.0) | 522 (100.0) | 0 (0.0) | 0 (0.0) | 1566 | 3.00 | 4 |

Note: Numbers in parentheses indicate percentages

Table 6 lists the opinions about availability of electronic learning sources in their libraries. Based on the weighted arithmetic mean the opinions are ranked. It is evident from the table that all the respondents were aware on electronic books and gave first rank for their availability in their libraries followed by on line databases (2nd rank), CD ROM databases (3rd rank), e-thesis and dissertation, microfilm/microfiche (4th rank), audio-visual materials (5th rank) and they assigned 6th rank for electronic journals'. It can be concluded that majority of the respondent's aware on electronic books and gave first rank for their availability in their libraries.

**Table 7:** Impact of ICT on user studies

| Opinion | Government | | Total |
|---|---|---|---|
| | Students | Teaching Staff | |
| High Impact | 298 (72.2) | 75 (68.8) | 373 (71.46) |
| Moderate Impact | 85 (20.6) | 25 (22.9) | 110 (21.07) |
| Low Impact | 0 (0.0) | 0 (0.0) | 0 (0.0) |
| No Impact | 0 (0.0) | 0 (0.0) | 0 (0.0) |
| No Response | 30 (7.3) | 9 (8.3) | 39 (7.47) |
| **Total** | **413 (100.0)** | **109 (100.0)** | **522 (100.0)** |

Note : Numbers in parentheses indicate percentages

It is clear from the Table 7 that majority of the respondents (71.46%) were opined that ICT impact is very high on their studies, followed by 21.07 per cent have moderate impact and remaining 7.47 per cent respondents were not responded. The same trend can be observed from various categories of the respondents. It can be concluded that majority of the students and teaching staff are opined that ICT impact is very high on their studies.

**Table 8:** Frequency in use of Electronic Resources

| Electronic Sources | Government | | |
|---|---|---|---|
| | Always | Sometimes | Rarely |
| Internet / E-mail | 410 (78.5) | 112 (21.5) | 0 (0.0) |
| WhatsApp | 490 (93.9) | 32 (6.1) | 0 (0.0) |
| Instagram | 0 (0.0) | 0 (0.0) | 522 (100.0) |
| Telegram | 0 (0.0) | 55 (10.5) | 467 (89.5) |



*Contd…*

| | | | |
|---|---|---|---|
| Social Networking Sites (Face book, Twitter, etc.) | 350 (67.0) | 50 (9.6) | 122 (23.4) |
| **Electronic Sources** | **Government** | | |
| | **Always** | **Sometimes** | **Rarely** |
| Electronic Books | 35 (6.7) | 68 (13.0) | 419 (80.3) |
| Electronic Journals/ Electronic Magazines | 0 (0.0) | 49 (9.4) | 473 (90.6) |
| Online Databases (e.g. DELNET, etc.) | 0 (0.0) | 0 (0.0) | 522 (100.0) |
| E-Theses & Dissertations | 0 (0.0) | 0 (0.0) | 522 (100.0) |
| Online Public Access Catalogue | 0 (0.0) | 30 (5.7) | 492 (94.3) |
| Open Access Journals/resources | 125 (23.9) | 250 (47.9) | 147 (28.2) |
| CD-ROM /DVDs / Video courses | 90 (17.2) | 204 (39.1) | 228 (43.7) |
| Institute library webpage | 0 (0.0) | 0 (0.0) | 522 (100.0) |

Note: Numbers in parentheses indicate percentages

It is evident from the Table 8 that majority of the respondents (93.9%) are using WhatsApp always followed by Internet/Email(78.5%), Social Networking Sites -Face book, Twitter, etc. (67%), Open Access Journals/resources(23.9%) , CD-ROM /DVDs / Video courses (17.2%) and 607 per cent of the respondents using Electronic books always.It can be concluded that majority of the respondents using WhatsApp always.

**Table 9:**Facing problems while using ICT based Library Services

| **Problems** | **Government** | | | |
|---|---|---|---|---|
| | **Disagree** | **Agree** | **Strongly Agree** | **No Response** |
| Lack of Technical Knowledge | 34 (6.5) | 210 (40.2) | 70 (13.4) | 208 (39.8) |
| Lack of Awareness | 80 | 250 | 35 | 157 |



***Contd…***

| | | | | |
|---|---|---|---|---|
| | (15.3) | (47.9) | (6.7) | (30.1) |
| Poor infrastructure of ICT | 0<br>(0.0) | 260<br>(49.8) | 101<br>(19.3) | 161<br>(30.8) |
| **Problems** | **Government** | | | |
| | **Disagree** | **Agree** | **Strongly Agree** | **No Response** |
| Poor maintenance of ICT | 0<br>(0.0) | 305<br>(58.4) | 65<br>(12.5) | 152<br>(29.1) |
| Poor Internet Connection | 55<br>(10.5) | 230<br>(44.1) | 104<br>(19.9) | 133<br>(25.5) |
| Number of Computers are not sufficient | 0<br>(0.0) | 122<br>(23.4) | 150<br>(28.7) | 250<br>(47.9) |
| Lack of Library staff co-operation | 95<br>(18.2) | 274<br>(52.5) | 20<br>(3.8) | 133<br>(25.5) |
| Lack of Technical Skilled Staff | 66<br>(12.6) | 128<br>(24.5) | 80<br>(15.3) | 248<br>(47.5) |
| Staff not always available to help | 55<br>(10.5) | 240<br>(46.0) | 0<br>(0.0) | 227<br>(43.5) |
| Lack of Time | 25<br>(4.8) | 180<br>(34.5) | 50<br>(9.6) | 267<br>(51.1) |

Note: Numbers in parentheses indicate percentages

It is clear from the Table 9 that considerable number of respondents strongly agree (19.9%) and agree (44.1%) that they were facing the problem with poor Internet connection in their libraries followed bypoor maintenance of ICT (58.4%),lack of library staff co-operation (52.5%), poor infrastructure of ICT (49.8%), lack of awareness(47.9%),staff not always available to help (46%), lack of technical knowledge (40.2%), lack of time (34.5%), lack of technical skilled staff (24.5%) and 23.4 per cent of the respondents facing the problems with number of computers are not sufficient.

**Table 10:**Getting help from the librarians on the ICT related activities

| ICT Activities | Government (n=522) | | | |
|---|---|---|---|---|
| | Frequently | Sometimes | Never | No response |
| Learning Management System (LMS) | 0 (0.0) | 0 (0.0) | 0 (0.0) | 522 (100.0) |
| MANA TV Video Lessons | 0 (0.0) | 198 (37.9) | 103 (19.7) | 221 (42.3) |
| DTH Videos | 0 (0.0) | 0 (0.0) | 0 (0.0) | 522 (100.0) |
| National Digital Library (NDL) | 110 (21.1) | 240 (46.0) | 0 (0.0) | 172 (33.0) |
| E-PG Pathasala | 0 (0.0) | 0 (0.0) | 0 (0.0) | 522 (100.0) |
| Swayam MOOCS Courses | 0 (0.0) | 0 (0.0) | 356 (68.2) | 16 (31.8) |
| NPTEL Video courses | 0 (0.0) | 0 (0.0) | 0 (0.0) | 522 (100.0) |
| NLIST | 321 (61.5) | 170 (32.6) | 0 (0.0) | 31 (5.9) |
| INFLIBNET databases | 150 (28.7) | 270 (51.7) | 0 (0.0) | 102 (19.5) |
| DELNET | 50 (9.6) | 120 (23.0) | 0 (0.0) | 352 (67.4) |

Note : Numbers in parentheses indicate percentages

It is observed from the Table 10 that most (61.5%) of the respondents are expressed their opinion they are getting help from librarians frequently while they using NLIST, followed by INFLIBNET databases (28.7%), National digital library (21.1%) and 9.6 per cent are frequently getting help for using DELNET resources. It can be also observed from the table that all cent percent of the respondents are did not responded or never getting help from the librarians about learning management system, DTH vedios, E-PG Pathasahala, Swayam MOOCS Courses andNPTEL video courses. The reason may be their college libraries are not providing those facilities or not using by the users.

**Table 11:**Satisfaction on ICT based library services provided by their college libraries

| Opinion | Government (n=522) | Percentage |
|---|---|---|
| Not Satisfied | 243 | 46.6 |
| Satisfied | 108 | 20.7 |
| Highly Satisfied | 32 | 6.1 |
| No Response | 139 | 26.6 |
| **Total** | **522** | **100.0** |

Note : Numbers in parentheses indicate percentages

It is evident from the Table 2 that nearly half (46.6%) of the respondents were not satisfied with ICT based library services provided by their college libraries followed by 26.6 per cent of the respondents not given any response, 20.7 per cent satisfied and remaining 6.1 percent of the responders aware highly satisfied in this regard. It can be concluded that most of the respondents were not satisfied with ICT based library services provided by their college libraries.

**Findings**

- More than half (50.57%) of the respondents were belongs to commerce stream.
- Nearly half (44.44%) of the respondents were average in competency in their computer literacy.
- Majority (72.61%) of the teaching staff and the students are opined that computer literacy is highly important for utilizing the electronic resources in the library.
- More than half (52.11%) of the teaching staff and students are opined open resources are useful which are available on internet.

- Majority (77%) of the respondents are opined that access to web resources are providing by their libraries.
- All the respondents were aware on electronic books and gave first rank for their availability in their libraries.
- Majority of the respondents (71.46%) were opined that ICT impact is very high on their studies.
- Majority of the respondents (93.9%) are using WhatsApp always.
- A considerable number of respondents strongly agree (19.9%) and agree (44.1%) that they were facing the problem with poor Internet connection in their libraries.
- Most (61.5%) of the respondents are expressed their opinion they are getting help from librarians frequently while they using NLIST.
- Nearly half (46.6%) of the respondents were not satisfied with ICT based library services provided by their college libraries.

## Conclusion

Effective application of information technology in library transmits users' satisfaction. The present scenario demands the updated technology for the faster and approachable library services. Gradually, new technologies are developed; consequently there is the need to develop our skills and capacity to provide enhanced library services. Library resources must be used at a large amount. The successfulness of a library and the library professional always depends on the quality of the service. The emergence of ICT is the new paradigm to extend the level of library operation and services. So, it is inevitable for the library professionals to be updated with the technology for the own existence.

Based on the findings of the study and with the above views, it is recommended that tot the concerned authorities to spend sufficient funds to provide ICT facilities and services to the library users towards getting latest required information or documents by the students and staff. It is also recommended to the concerned authorities to conduct training programmes to students and staff for better utilization of ICT facilities and services. It is further suggested to the authorities concerned to take measures towards to improve the frequently visiting of the library among users, to improve the reading habits, to use the e-resources and ICT facilities which are available in their colleges.

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# A Unique research on K.L.University Web-based resources: awareness and usage under the Corona pandemic scenario

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## ABSTRACT

*The Sci-hub is a vast repository of freely accessible information on Web. However, it is unknown if teachers and students are aware of open source knowledge. The purpose of this study is to investigate teachers' and students' knowledge of and usage of Web-based resources at K.L.University. In this study, a questionnaire-based survey approach was utilized. A survey was created in the form of an e-questioner and delivered to 200 library patrons. A total of 140 (70%) library patrons completed the survey. According to the data, 80 (40%) of respondents are unaware of Web-based resources, while 100 (50%) are unaware of Web-based resources supplied by publishers and suppliers during the pandemic crisis. According to the findings, training on Web-based resources is recommended.*

**Keywords:** *Web-based resources, Pandemic, NSL, Sci-Hub, NPTEL, NLIST, J-GATE, IBM-Drug Data Base, Medicines Complete, PubMed & DELNET*

## INTRODUCTION

During the Serial Crisis, web-based resources proved to be a goldmine for information surfers and specialists. Academicians and we have been employing these resources for a lot of projects since the Web-based approach arose. NPTEL, the National Science Library Repository (NSLR), NLIST, J-Gate-Biomedical, IBM-Micromedex Drug Data Base, NDLI, and the Royal Society's Medicines Complete are just a few of the resources given. Web-based is a novel publication paradigm that allows scientific research to be accessed for free online. It allows us to read, download, and utilize the published content without cost. Web access, also known as online access, is a goldmine for institutions that have a difficult time preserving and expanding their library collections. Given the importance of Web-based resources, the purpose of this study is to determine how well the academic community at KLU is aware of the notion and how much they use it in their

research. We also attempted to figure out what an academic group of persons undergoing research expects from the library in terms of Web-based resources.

## PURPOSE OF OUR STUDY

The following are the study's key goals:

1. Determine the extent to which teachers and pupils are aware of Web-based resources.
2. Determine the extent to which academic Web-based materials are being used.
3. To determine the challenges that users have while accessing Web-based resources during Pandemic

## OUR RESEARCH METHODOLOGY- WE HAVE CHOSEN FOR THIS STUDY

The study used a group of teachers and students from the KLU as a sample. A survey was created in an online format and delivered to 200 library patrons. A total of 140 library users (70%) completed the survey. The information was gathered in May of 2021. The information gathered through an online questionnaire created using online e- forms was examined, and the results were presented as generalizations.

## ANALYSIS AND INTERPRETATION OF OUR DATA:

A survey was done among B.Tech. & B.Pharm. Pupils and instructors from K.L.University (it is in Guntur, Capital city of newly formed State of Andhra Pradesh) institutions to examine teacher and student knowledge of Web-based resources. 140 people (70 percent) responded to the questionnaire.

**Table 1:** Information source of choice:

| Preferred Source of Information | B.Tech Students | B.Pharm Students | Instructors of both courses | Total | % |
|---|---|---|---|---|---|
| Printed Resources | 28 | 14 | 14 | 56 | 28 |
| Online e-resources | 39 | 19 | 18 | 76 | 38 |
| Dictated Notes | 03 | 04 | 0 | 07 | 3.5 |

According to the data in the table 1 , respondents' favorite source of information is the Google. As many as 76 (38 percent) of those surveyed selected the Online e-resources as their primary source of information. Another large group of 56 (28 percent) responders is still considering books from the library. The research also reveals that there isn't a significant difference in the number of respondents who prefer to get information via the e- resources vs those who prefer to get it through printed books. This demonstrates that, despite the Web invasion, libraries continue to serve an important role in academia.

**Table 2:** Purpose of access to Sci-Hub & Web:

| **Purpose** | **Surfing of Sci-Hub & Web** | **%** |
|---|---|---|
| Towards their study materials | 140 | 70 |
| Towards Dissertation work | 60 | 30 |
| Towards other research purpose | 60 | 30 |

Because it's critical to understand why people use the Sci-hub, a question on why people use it was included in the survey. Respondents were given the option of using the Sci-hub for many purposes. Table 2 demonstrates that the majority of 140 respondents (70%) utilize the Sci-hub to find course-related content. It is used by 60 (30%) of academics for research. This group, which primarily consists of instructors and students, uses the Sci-hub to look for projects, higher education possibilities, and other reasons not specified in the form.

**Table 2:** Knowledge on prominent Web- based resources & Services:

| Web-based resources | Awareness | % |
|---|---|---|
| NPTEL Study Resources | 56 | 28 |
| J-Gate : Gateway of e-Journals | 52 | 26 |
| DELNET Providing online resources & ILL Service | 22 | 11 |
| N-LIST : Scholarly Content (as a part of e-Sodh Sindhu) | 06 | 3 |
| PubMed (PMC-OAI) metadata | 38 | 19 |



***Contd…***

| | | |
|---|---|---|
| NSL Repository (Subject wise) | 18 | 9 |
| IBM – Micromedex (Drug Database) | 116 | 58 |
| Royal Pharmaceutical Society's Medicines Complete | 36 | 18 |
| ProQuest online Databases | 70 | 35 |
| Compendex | 12 | 6 |
| SciFinder-n | 66 | 33 |
| Science Direct – Elsevier | 116 | 58 |
| Bentham Science Content | 70 | 35 |

In order to determine which Web-based resources respondents utilize or aware of, they were asked to choose the one they are familiar with. The table 2 compares how well people know about various key Web-based resources. Elsevier Science Direct, IBM Micromedex, and Bentham Science Content were more recognizable to the respondents. Science Direct and Micromedex are known by about 58 percent of the respondents. ProQuest and Bentham Science come in second and third, respectively, with 35 percent of the responses. However, the overall picture shows that the bulk of Web-based resources are used less than 30% of the time and just a handful are used more than 40% of the time. This demonstrates the critical need of raising public awareness about the availability of various information sources.

**Table 3:** Challenges faced in using Web-based Resources

| Challenges | Response | % |
|---|---|---|
| Insufficient knowledge | 140 | 70 |
| Improper training | 72 | 36 |
| Low technical facility | 28 | 14 |
| Low Surfing ability | 40 | 20 |

The participants were asked questions about the most significant barriers to using these websites. According to the statistics, the most significant barrier to using these open and free resources is a lack of knowledge as well as training. The majority of 140 respondents cited a lack of awareness as a difficulty to using Web-based services, followed by 72 who cited a lack of training. It illustrates the need of having a clear mechanism for sharing information regarding Web-based resources to the academic community. To promote awareness including the use of Web-based resources, library staff may explore initiatives such as library orientation sessions, workshops, and guest lecturers.

## THE FOREMOST OUTCOMES OF OUR STUDY

- The Sci-hub is the most popular first-hand information source.
- For information, the majority of respondents 130 indicated a strong preference for both print and digital forms of sources.
- The majority of 138 respondents utilize the Sci-hub to find course-related resources.

## A FEW HUMBLE RECOMMENDATIONS

According to the results of our survey, professional library community should actively analyze the Web resources obtainable at online. Web resources became a new intellectual destination during this pandemic for every information seekers. Some content providers make their resources available online to aid in the teaching and learning process. It was also of considerable assistance to all academic sections in the society. In this context, academics should be made aware of their institutional online repository services.

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# Users Perceptions towards Digital Resource Sharing and Networking of Engineering College Libraries affiliated to JNTUH, Hyderabad

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## Abstract

*Resource sharing is an important and widely well-known concept in the field of library science. The concept recognized by the term 'library networking' deals with the interconnection of libraries so that the participating libraries can share the information and resources effectively. The purpose of the paper is to understand availability of digital resources, presence of various library networks and their resource sharing activities in engineering college libraries affiliated to JNTUH, Hyderabad. The paper highlights the various library networks established for resource sharing activities, the reasons for joining such networks, and problems encountered while accessing resources during in its participation. Survey method has been employed to conduct this study and stapled data related to digital resource sharing and networking in the libraries of engineering colleges. Total 1240 responses were received from undergraduate, postgraduate and faculty members in autonomous and non-autonomous engineering colleges*.

Keywords: *Library networking, Information resources, Resource sharing, Engineering college libraries, Hyderabad city*

## Introduction

Modern academic libraries are establishing resource sharing networks as a mode of library operation where all or part of individual library functions would be shared among several libraries. The primary objective for participating in resource sharing activities is to enhance the accessibility of resources and services at a lesser expense. Library resources always stapled with various formats of reading and non-

reading materials like human capital, tools, services, methods, abstracting and indexing databases, full-text databases, cooperative acquisition, union-catalogues, and intellectual expertise (Shivalingaiah, 2003). The advancement of information technology has resources and encouraged resource sharing activities between libraries. In the pace of technological improvement, present libraries derive to have great interest in mutual library cooperation at national and international level. Technologies removed all geographical barriers and provided alternative opportunities to everyone. The pressing need of resource sharing has witnessed the emergence of several local, regional, national and international level libraries networking such as INFLIBNET, MANLIBNET, DELNET etc.

### Objectives

1. To assess the awareness of Library Resources, Services and Facilities
2. To know the awareness of Resource Sharing and Networking of Libraries
3. To find out the utilization of other Library Resources
4. To examine ways to getting information through DELNET, INFLIBNET, GIST etc
5. To discover the difficulties while using print and electronic resources.
6. To find out the overall satisfaction with regard to print resources, electronic resources and library services.

### Methodology

The methodology for the present research study used is survey method. The data has been collected through the questionnaire method from the faculty, and students in the engineering college libraries affiliated to JNTUH in the Hyderabad region (District). The sample population for the study covers all the 20 engineering colleges' B.Tech, M.Tech and Faculty members located in the Hyderabad region. Out of 20 colleges, 5 colleges have autonomous status and the remaining 15 colleges are non-autonomous. Total1240 responses were received among them 800(64.52%) of the respondents are Undergraduate students, 315(25.40%) are Postgraduate students and the remaining 125(10.08%) of the respondents are Faculty members. Simple random sampling method was used for this study.

## Data Analysis and Interpretation of data

This part deals with the analysis and interpretation of data pertaining to engineering college library users. The data has been collected from 1240 users of engineering college libraries affiliated to JNTUH and located in Hyderabad city.

**Table 1: Distribution of Respondents according to Academic Status-wise**

| S.No. | Name of the College | Under Graduate Students (B. Tech) | Post Graduate Students (M. Tech) | Faculty Members | Total | % |
|---|---|---|---|---|---|---|
| 1 | AARMEC (NA) | 47 | 17 | 8 | 72 | 5.81 |
| 2 | ASTRA (NA) | 44 | 12 | 6 | 62 | 5.00 |
| 3 | BRECW(NA) | 37 | 0 | 6 | 43 | 3.47 |
| 4 | BVRIT(NA) | 36 | 0 | 9 | 45 | 3.63 |
| 5 | CMRCET(A) | 45 | 24 | 7 | 76 | 6.13 |
| 6 | CSIWITS(NA) | 47 | 24 | 5 | 76 | 6.13 |
| 7 | GNITSW(A) | 47 | 17 | 6 | 70 | 5.65 |
| 8 | JBIET(A) | 37 | 15 | 8 | 60 | 4.84 |
| 9 | JNTUIST(A) | 42 | 20 | 9 | 71 | 5.73 |
| 10 | KMIT(NA) | 39 | 14 | 8 | 61 | 4.92 |
| 11 | LIET(NA) | 37 | 13 | 5 | 55 | 4.44 |
| 12 | MIST(NA) | 34 | 0 | 8 | 42 | 3.39 |
| 13 | MEC(NA) | 41 | 13 | 6 | 60 | 4.84 |
| 14 | MGCET(NA) | 39 | 12 | 4 | 55 | 4.44 |
| 15 | MCET(NA) | 38 | 22 | 3 | 63 | 5.08 |
| 16 | NSAKCET(NA) | 42 | 18 | 6 | 66 | 5.32 |
| 17 | RMIETW(NA) | 42 | 18 | 8 | 68 | 5.48 |
| 18 | SITJNTUH(A) | 21 | 43 | 5 | 69 | 5.56 |
| 19 | SWCET(NA) | 44 | 14 | 4 | 62 | 5.00 |
| 20 | SVIET(NA) | 41 | 19 | 4 | 64 | 5.16 |
| | Total | 800 (64.52%) | 315 (25.40%) | 125 (10.08%) | 1240 | 100 |

**A= Autonomous** **NA = Non- Autonomous**

Table 4.42 indicates academic status-wise respondents, among 1240 respondents the majority 800(64.52%) of the respondents are Undergraduate students, 315(25.40%) are Postgraduate students and the remaining 125(10.08%) of the respondents are Faculty members.

Table further indicates the college-wise number of respondents also. The majority 76(6.13%) of the respondents are from CMRCET (Autonomous) and CSIWITS (Non -Autonomous) engineering colleges and the lowest number 42(3.39%) of the respondents are from MIST engineering college (Non - Autonomous).

**Table 2: Distribution of respondents according to Type of Management**

| Type of Management | In number | In percentage |
|---|---|---|
| Autonomous | 400 | 32.26% |
| Non-Autonomous | 840 | 67.74% |
| **Total** | **1240** | **100** |

It is evident from Table 2 that out of the total respondents, the majority that is 840 (67.74%) are from Non-autonomous colleges and the remaining 400 (32.26%) are from Autonomous engineering colleges.

**Table 3: Distribution of respondents according to Gender-wise**

| Gender | Under Graduate | Post Graduate | Faculty Members | Total | % |
|---|---|---|---|---|---|
| Male | 528 (66%) | 195 (61.90% | 88 (70.4%) | 811 | 65.40 |
| Female | 272 (34% ) | 120 (38.09%) | 37 (29.6%) | 429 | 34.60 |
| Total | 800 (100%) | 315 (100%) | 125 (100%) | 1240 | 100 |

Table 3 indicates gender-wise distribution of the respondents. Out of 1240 respondents surveyed, majority that is 811(65.40%) are male. Among these 528 are UG and 195 are PG students and 88 are faculty members. About 429(34.60%) respondents are female respondents. Among them 272 are UG and 120 are PG students while 37 are faculty members. It can be inferred from the data presented in the table that the male respondents are more than female respondents.

**Table 4: Age-wise Distribution of respondents**

| Age | Under Graduate | Post Graduate | Faculty Members | Total | % |
|---|---|---|---|---|---|
| below 25 | 776 (97%) | 172 (54.60 %) | 2 (1.6 %) | 950 | 76.61 |
| 26-35 | 22 (2.75%) | 138 (43.80% ) | 68 (54.4%) | 228 | 18.39 |
| 36-45 | 1 (0.12%) | 4 ( 1.26%) | 34 (27.2%) | 39 | 3.15 |
| above 45 | 1 (0.12 %) | 1 (0.12% ) | 21 (16.8 %) | 23 | 1.85 |
| Total | 800 (100%) | 315 (100%) | 125 (100%) | 1240 | 100 |
| Calculated Chi square = 884.541; Table value = 12.59; df = 6; Significant at 0.05 level | | | | | |

The distribution of participants was done on age-wise basis to find out the perception of the participants according to their age. Certainly there will be difference in the perception of the participants based on their age in the academic status.Table 4reveals that 950(76.61%) of the respondents are aged below 25 years. Among them 776 are undergraduates, 172 are postgraduates and only 2 are faculty members. 228(18.39%) of the respondents are aged between 26-35 years. Among them 138 are post graduates, 22 are undergraduates and 68 are faculty members. 39(3.15%) of the respondents are in the 36-45 years age group, and 23(1.85%) of the respondents are aged above 45 years. Certainly there will be difference in academic status and age.It is also evident from the table that there is a significant difference between the respondents with regard to their age as it is proved by Chi-square value which is significant at 0.05 levels with six degrees of freedom. That means more number of respondents are below 25 years.

**Table 5: Awareness of Library Resources, Services and Facilities**

| | Respondents (N=1240) | | |
|---|---|---|---|
| **Awareness** | **Very aware** | **Slightly aware** | **Not at all aware** |
| Print resources | 971 (78.31%) | 260 (20.97%) | 9 (0.73%) |
| Electronic resources | 868 (70%) | 360 (29.03%) | 12 (0.97%) |
| Services | 592 (47.74%) | 583 (47.02%) | 65 (5.24%) |
| Facilities | 523 (42.18%) | 637 (51.37%) | 80 (6.45%) |
| Calculated Chi square = 492.989; Table value = 12.59; df = 6; Significant at 0.05 level | | | |

Normally, the expertise is a factor which relates to an individual's career. Table 5 indicates the awareness of the library resources, services and facilities available in the library. Most that is, 971 (78.31%) of the respondents were 'very aware' of 'print resources', 260(20.97%) are 'slightly aware' and 9(0.73%) are 'not at all aware' of print resources. 868(70%) have 'very aware' 360(29.03%) of the respondents are 'slightly aware' and 12(0.97%) of the respondents are 'not at all aware' of 'electronic resources'. Majority 592(47.74%)of the respondents 'very aware', 583(47.02%) are 'slightly aware' and 65(5.24%) of the respondents are 'not at all aware' of library 'services'. Most that is 523(42.18%) of the respondents are

'very aware', 637(51.37%) 'slightly aware and 80(6.45%) of the respondents are 'not at all aware' of library 'facilities.

It is also further illustrated from the table that there are significant differences between Undergraduate, Postgraduate and Faculty Members with regard to awareness of Library Resources, Services and Facilities as it is proved by Chi-square values which are significant at 0.05 levels with six degrees of freedom. That means more number of respondents are aware of print resources when compared to electronic resources, services and facilities.

**Table 6:** Awareness of Resource Sharing and Networking of Libraries

| Opinion | Under Graduate | Post Graduate | Faculty Members | Total | Autonomous | Non Autonomous |
|---|---|---|---|---|---|---|
| Yes | 664 (83%) | 289 (91.75%) | 121 (96.8%) | 1074 (86.62%) | 370 (92.50%) | 704 (83.80%) |
| No | 136 (17%) | 26 (8.25%) | 4 (3.2%) | 166 (13.38%) | 30 (7.50%) | 136 (16.20%) |
| **Total** | 800 (100%) | 315 (100%) | 125 (100%) | 1240 (100%) | 400 (100%) | 840 (100%) |
| Calculated Chi square = 27.352; Table value = 5.99; df = 2; Significant at 0.05 level | | | | | | |

Table 6shows details of the awareness of users about resource sharing and networking of libraries. Majority of the respondents 1074(86.62%) are aware of resource sharing and networking of libraries. Among them 664 are UG, 289 are PG students and 121 are faculty members and only 166(13.38%) of the respondents said they do not have awareness. Among them 136 are UG, 26 are PG students and 4 respondents are faculty members. They said that they are not aware of resource sharing and networking of libraries.

It is also clear from the above table that there are significant differences between Graduate, Post Graduate Students and Faculty Members on the one hand and Autonomous and Non Autonomous Colleges on the other hand with regard to the awareness of respondents about resource sharing and networking of libraries. It is proved by Chi-square values which are significant at 0.05 levels with two degrees of freedom. That means more number of faculty members and autonomous colleges' respondents are aware of resource sharing and networking of libraries when compared to graduate students, post graduate students, and non autonomous college respondents.

**Table7: Utilization of other Library Resources**

| Opinion | Under Graduate | Post Graduate | Faculty Members | Total | Autonomous | Non Autonomous |
|---|---|---|---|---|---|---|
| Yes | 773 (97.59%) | 307 (97.4%) | 122 (97.6%) | 1202 (96.94%) | 391 (97.75%) | 811 (96.54%) |
| No | 27 (3.37%) | 8 (2.53%) | 3 (2.4%) | 38 (3.06%) | 9 (1.9%) | 29 (3.71%) |
| Total | 800 (100%) | 315 (100%) | 125 (100%) | 1240 (100%) | 400 (100%) | 840 (100%) |
| Calculated Chi square = 0.738; Table value = 5.99; df = 2; Not significant at 0.05 level | | | | | | |

Table 7 present details of the utilization of resources of the other libraries. Majority of the 1202(96.94%) of the respondents expressed their opinion saying 'Yes' they are utilizing other library resources. And only 38(3.06%) of the respondents expressed their opinion saying 'No'.

It is also obvious from the above table that there is no significant difference between Graduates, Post Graduate Students and Faculty Members on the one hand and Autonomous and Non Autonomous Colleges on the other hand with regard to the awareness of respondents about resource sharing and networking of libraries. It is proved by Chi-square values which are not significant at 0.05 levels with two degrees of freedom. That means most of the Graduate, Post Graduate Students and Faculty Members on the one hand and Autonomous and Non Autonomous Colleges on the other hand are utilizing other library resources.

**Table 8: Getting information through DELNET, INFLIBNET, GISTetc,**

| Opinion | Under Graduate | Post Graduate | Faculty Members | Total | % |
|---|---|---|---|---|---|
| Yes | 685 (85.62%) | 287 (91.11%) | 102 (81.6%) | 1074 | 86.61 |
| No | 115 (14.37%) | 28 (8.88%) | 23 (18.4%) | 166 | 13.39 |
| **Total** | 800 (100%0 | 315 (100%) | 125 (100%) | 1240 | 100.00 |
| Calculated Chi square = 8.879 Table value = 5.99; df = 2; Significant at 0.05 level | | | | | |

Table 8describe the usage of DELNET, INFLIBNET, GIST and other networks for getting required information. Majority 1074(86.61%) of the

respondents positively expressed their opinion regarding getting information through DELNET, INFLIBNET, GIST networks, and 166(13.39%) responded negatively.

To know the significance in the opinions of the respondents on the basis of the academic status of engineering colleges, the researcher applied the Chi-square test. The calculated Pearson chi-square value 8.879 is greater than the table value 5.99 at two degrees of freedom at 0.05 levels of significance. Hence, it can be concluded that there is a significant difference between respondents with regard to perception of user needs and with their usage of DELNET, INFLIBNET, GIST and other networks for getting required information.

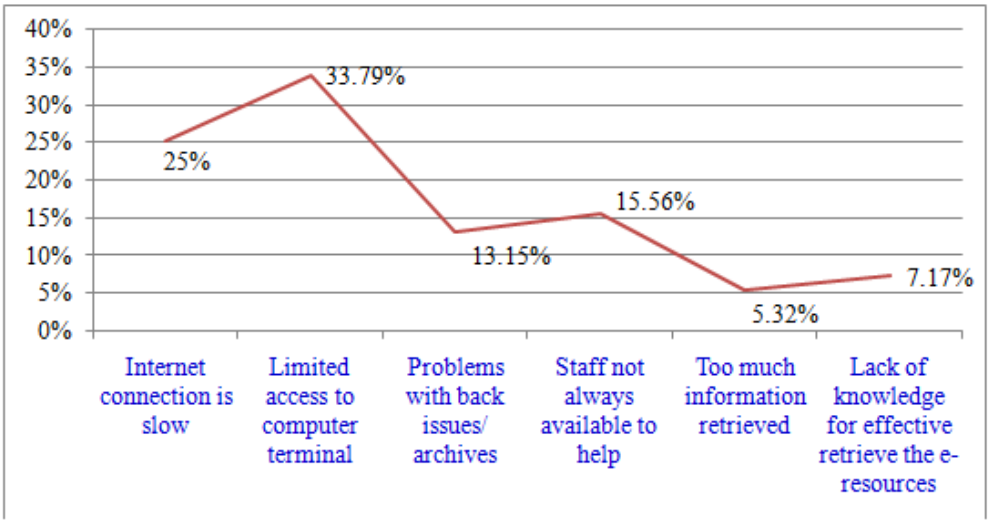



**Figure 1:** Difficulties while accessing Electronic Resources

Difficulties while accessing electronic resources were presented in the figure 1. Majority 419 (33.79%) of the respondents expressed the opinion that 'limited access to computer terminals' is main difficulty encountered while using electronic resources. Among them 277 are UG, 113 are PG students and 29 are faculty members. 310(25%) say 'Internet connection is slow', 193(15.56%) say 'staff not always available to help', 163(13.15%) say 'Problems with back issues/archives', 89(7.18%) identified 'lack of knowledge for effective retrieve the e-resources as main problem. Among them 59 are UG, 19 are PG students and 11 are faculty members, and 66(5.32%) of the respondents said 'Too much information retrieved' while using electronic resources is the main problem.

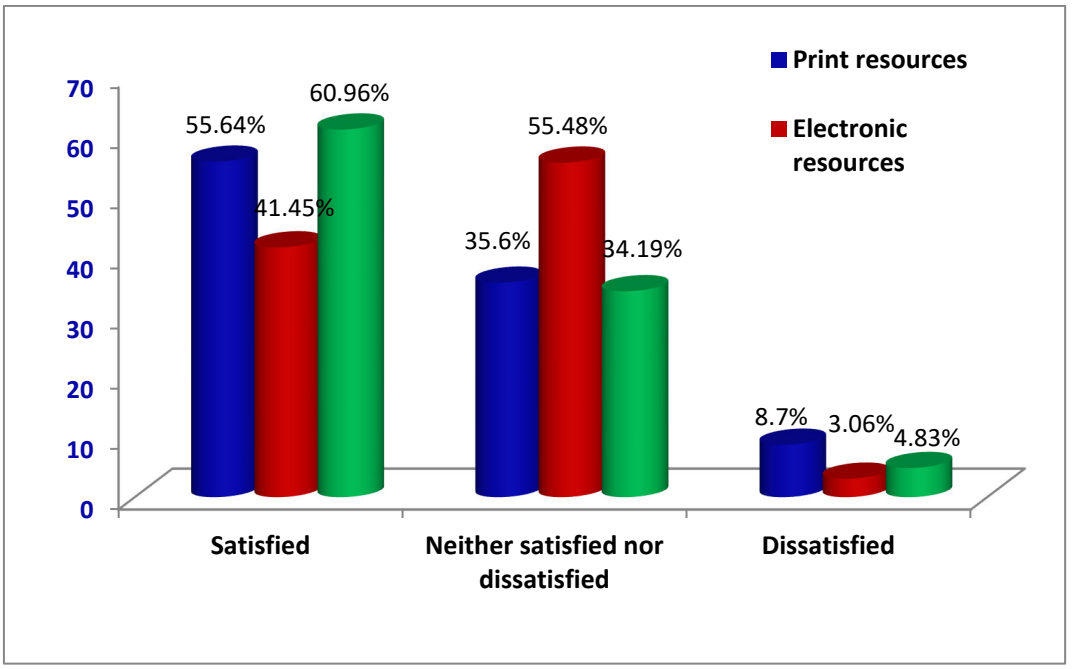



**Figure 2:** Distribution of respondents according to overall Satisfaction with Print Resources, Electronic Resources and Library Services

The Fig. 2displays category wise overall satisfaction level of users with print and electronic resources and library services. It is evident from the table that, majority of the respondents (55.64%) are satisfied with print resources, 35.6 per cent opined that are neither satisfied nor dissatisfied and the remaining 8.70 per cent are dissatisfied with existing print resources. It is also revealed from the table that majority of the respondents (55.48%) are neither satisfied nor dissatisfied with electronic resources whereas 41.45 per cent opined that they are satisfied while the remaining 3.06 per cent are dissatisfied with existing electronic resources. It is also further revealed from the table that majority of the respondents (60.96%) are satisfied with library services, whereas 34.19 per cent opined that they are neither satisfied nor dissatisfied and the remaining 4.83 per cent said they are dissatisfied with available library services.

## Findings

- Among 1240 respondents the majority 800(64.52%) of the respondents are Undergraduate students, 315(25.40%) are Postgraduate students and the remaining 125(10.08%) of the respondents are Faculty members.

- Majority 76(6.13%) of the respondents are from CMRCET (Autonomous) and CSIWITS (Non -Autonomous) engineering colleges and the lowest number 42(3.39%) of the respondents are from MIST engineering college (Non -Autonomous).
- Out of the total respondents, the majority that is 840 (67.74%) are from Non-autonomous colleges and the remaining 400 (32.26%) are from Autonomous engineering colleges.
- Out of 1240 respondents surveyed, majority that is 811(65.40%) are male.
- Out of 1240 respondents,950 (76.61%) of the respondents are aged below 25 years. Among them 776 are undergraduates, 172 are postgraduates and only 2 are faculty members.
- Most that is, 971 (78.31%) of the respondents were 'very aware' of 'print resources', 868(70%) have 'very aware' 360(29.03%) of 'electronic resources'.
- Majority 592 (47.74%) of the respondents 'very aware',of library 'services'.
- Most that is 523(42.18%) of the respondents are 'very aware', of library 'facilities.
- Majority of the respondents 1074(86.62%) are aware of resource sharing and networking of libraries.
- Majority of the 1202(96.94%) of the respondents expressed their opinion saying 'Yes' they are utilizing other library resources.
- Majority 1074 (86.61%) of the respondents positively expressed their opinion regarding getting information through DELNET, INFLIBNET, GIST networks, and 166(13.39%) responded negatively.
- Majority 419 (33.79%) of the respondents expressed the opinion that 'limited access to computer terminals' is main difficulty encountered while using electronic resources.
- Majority of the respondents (55.64%) are satisfied with print resources.
- Majority of the respondents (55.48%) are neither satisfied nor dissatisfied with electronic resources.
- Majority of the respondents (60.96%) are satisfied with library services.

## Conclusion

It is an established fact that working together can accomplish far more than they can do individually. The age of library consortia has already dawned and has already proved to be a tremendous success in the context of an overwhelming array of digital documents. The e-subscription activity under consortia covers not only in related disciplines but also in all the disciplines with the heterogeneous nature institutions. With global application, Technical education has emerged as a prestigious area of higher education. This calls for a concerted effort for the establishment of a nationwide consortium enlisting the participation of JNTUH affiliated engineering colleges and prestigious IITs and IIITs in the country. If India has to emerge as a production hub of the world, strong foundation has to be laid for technical education facilitating easy dissemination of related information. This needs concerted efforts from the part of both the central and governments to establish consortia and networks so as to bridge the hiatus between the haves and have nots transcending economic, social and regional barriers.

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# Awareness and Use of Social Media by Faculty members of Sri Padmavathi Mahila Visvavidyalayam for Scholarly Communication: A Case Study

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## Abstract

*New technologies have radically changed the way in which people communicate. With the ubiquity of platforms like WhatsApp, Facebook, Twitter, Myspace, Skype, LinkedIn and the like, social media is quickly becoming an indispensable part of people's lives. They are used to communicate, read, comment, share, like, and create content. These platforms are gaining popularity, and an increasing number of academicians, especially faculty, now comprise the reasonable percentage of social media users. The academicians make use of social media primarily to meet their information needs. The purpose of this study is to explore the awareness and use of social media by faculty members of Sri Padmavathi Mahila Visvavidyalayam for their scholarly communication. A descriptive survey design was adopted with the use of questionnaires as instruments for data collection. The simple random sampling technique was used for data collection from 158faculty members. Data were analysed using frequency counts, percentages and means. The results revealed that the respondents were having 'good' awareness on social media. All faculty members were frequently utilized WhatsApp and YouTube social media tools for their personal, teaching and scholarly communication purposes. The study found that faculty was preferred 'social media' for their digital communication during COVID -19. 'Poor network connectivity/ slow download speed' is the main problem they are facing. It was recommended, among other things, that faculty should be getting awareness programmes frequently about access and use of social media networks/resources for scholarly communication through their libraries.*

**Keywords***: social networking sites, SPMVV, university libraries, faculty, usage of social media*

## Introduction

Social media is the interactive communication that exists between people using a specialized electronic platform such as Facebook, WhatsApp, Twitter, Myspace, Linkedin and Instagram. These provide a means that allows them to create and share content (Lewis, 2009). Scholars observe that social media facilitates the growth of interactive dialogue and communities of users, regardless of their physical location; notably, academic libraries market their products and services on social media and make users aware of what goes on in the library, providing useful information that is accessed by online users in the social network space. Social media involves technology, social interaction and the coordination of ideas for creative and scientific innovation. This interaction and the manner in which information is presented allow for the integration of diverse perspectives, as people share information freely and confer and interact with others. Through websites, individuals can create, share, connect and exchange ideas and opinions with one another and engage in person to person conversation. Social media have a significant influence on the academic performance of faculty members, and their qualitative impact is determined by the type of usage (Mehmood and Taswir, 2013; Ahmed and Qazi, 2011).

## Sri Padmavati Mahila Visvavidyalayam – A Brief profile

Sri Padmavati Mahila Visvavidyalayam (University for Women )was founded in the year 1983 by Sri N.T.Rama Rao, the then Chief Minister of Andhra Pradesh, with the fervent desire to train women students as better builders of the Nation and to inculcate skills of leadership in all aspects of life. The University was established under the Sri Padmavati Mahila Visvavidyalayam Act of 1983,which has come into force on the 14 of April 1983. Today the University has a student population nearly 4000 and an academic staff of 105 and 131 academic consultants. The University has 59 courses at the post-graduate and undergraduate level and a good component of research. The campus of Sri Padmavati Mahila Visvavidyalayam is spread out in a lush green area of 138.43 acres. The University is situated at a distance of 3 km from the railway and bus stations of Tirupati. The campus has the necessary buildings to run its academic programmes and administrative machinery. There are separate buildings for Humanities and Sciences, University Administration, Central Library, University Auditorium, Sericulture Complex, and School of Pharmaceutical Sciences and also an

independent building for Computer Science, Business Management and Engineering College.

University library was started in 1983 with about 839 books and 29 periodicals. Now it has a collection of over 99,000 volumes, 8000 back volumes of periodicals and 97 current periodicals subscribed for the year 2019-2020. Under INFLIBNET programme the University Library has implemented the first version of software i.e SOUL 1.0, in the year of 2001-2002. The latest version of the software i.e. SOUL 2.0 was adopted in university library in 2009.

## Objectives of the study

The objectives of this study are :

1. To find out the awareness of Social media among university faculty members;
2. To identify the average time spent daily on social media;
3. To examine the use of social media for personal, teaching and scholarly communication;
4. To determine the reasons for using social media sites for scholarly communication;
5. To ascertain the role of social media for digital communication during COVID-19 Pandemic;
6. To investigate the problems faced while accessing social media;
7. To know the libraries role to create awareness about access and use of academic social media sites;
8. To discover overall satisfaction with Social Media Sites provided for scholarly communication.

## Methodology

The descriptive survey design was adopted for this study. The population was made up of faculty members of Sri Padmavathi Mahila Visvavidyalayam, Tirupathi, Andhra Pradesh State, who are Assistant Professors, Associate Professors and Professors. According to the library records of Sri Padmavathi Mahila Visvavidyalayam the total population of faculty members were 294. The simple random sampling technique was used for data collection from 158 faculty members. The only instrument used for data collection was the questionnaire that contained close-ended items. Data were analysed using frequency counts,

percentages and means. The study was carried towards the close of 2021-22 academic session.

## Analysis and Interpretation

**Table 1:** Demographic characteristics of respondents

| Demographic Characteristics | | Number | Percentage |
|---|---|---|---|
| Gender | Male | 22 | 13.92 |
| | Female | 136 | 86.08 |
| Age | Less than 30 yrs | 03 | 1.89 |
| | 31- 40 yrs | 54 | 34.19 |
| | 41 - 50 yrs | 55 | 34.81 |
| | 51 and above | 46 | 29.11 |
| Qualifications | Post Graduation | 03 | 1.89 |
| | M.Phil | 11 | 6.97 |
| | Ph.D, | 144 | 91.14 |
| Faculty cadre | Assistant Professor | 71 | 44.94 |
| | Associate Professor | 48 | 30.38 |
| | Professor | 39 | 24.68 |
| Faculty | Social Sciences | 95 | 60.13 |
| | Sciences | 63 | 39.87 |
| Teaching Experience | 1-5 years | 10 | 6.33 |
| | 6-10 years | 51 | 32.28 |
| | 11-15 years | 58 | 36.71 |
| | More than 15 years | 39 | 24.68 |
| Research Experience | 1-5 years | 14 | 8.86 |
| | 6-10 years | 58 | 36.71 |
| | 11-15 years | 48 | 30.38 |
| | More than 15 years | 38 | 24.05 |

Table 1 indicates demographic characteristics of respondents. The data shows that majority (86.08%) of faculty is female respondents while the male faculty makeup only 13.92 per cent of the overall return responses. In terms of age, four age categories were delineated where 34.81% are in the range of 41 to 50 years old, followed by 34.19% in the age range of 31-40 years old, 29.11% are aged 51 years and above and 1.89% in the age group of less than 30 years old. The table also reveals that 44.94 percent of Assistant Professors, 30.38% of Associate Professors and 24.68 percent Professors are there in the faculty. From the demographic information obtained, most of the respondents (91.14%) are Ph.D. holders, 6.97% of faculty had M.Phil qualification and remaining 1.89 per cent respondents possesses post graduation.As stated in the table, majority (60.13%) of the respondents belongs to Social Science subjects and 39.87 percent of respondents belong to Science discipline. In respect of teaching experience 36.71 per cent have been teaching 11 to 15 years followed by 6-10 years (32.28%), more than 15 years (24.68%) and 6.33 per cent are teaching between 1-5 years. Based on the above table, 36.71 per cent of the respondents have 6-10 years of research experience followed by 11-15 years (30.38%), more than 15 years (24.05%) and remaining 8.86 per cent have 1 to 5 years research experience.

**Table 2:** Awareness of Social media

| Awareness of Social Media | Designation | | | Subject of Study | | Total |
|---|---|---|---|---|---|---|
| | Assistant Professors | Associate Professors | Professors | Social Sciences | Sciences | |
| Very good | 14 (19.72) | 07 (14.58) | 05 (12.82) | 14 (14.74) | 12 (19.05) | 26 (16.46) |
| Good | 57 (80.28) | 41 (85.42) | 34 (87.18) | 81 (85.26) | 51 (80.95) | 132 (83.54) |
| Poor | 00 (00.00) | 00 (00.00) | 00 (00.00) | 00 (00.00) | 00 (00.00) | 00 (00.00) |
| Total | 71 (100.00) | 48 (100.00) | 39 (100.00) | 95 (100.00) | 63 (100.00) | 158 (100.00) |

(Note: Numbers in parenthesis indicated percentages)

As indicated in the Table 2, majority (83.54%) of the faculty mentioned that they have 'good' awareness on social media whereas 16.46 per cent faculty has 'very good' awareness on social media. It is also noticed that majority (80.28%) of the Assistant Professors, 85.42 per cent Associate Professors and 87.18 per cent

Professors mentioned 'good' awareness on social media. It is also evident that majority (85.26%) of respondents belong to Social Science subjects and 80.95 percent of respondents belong to Sciences have 'good' awareness on social media. That means majority of the faculty members have good awareness on social media.

**Table 3:** Average time spentdaily on social media

| Average time Spending | Designation | | | Subject of Study | | Total |
|---|---|---|---|---|---|---|
| | Assistant Professors | Associate Professors | Professors | Social Sciences | Sciences | |
| Less than 1 hour | 2 (2.82) | 12 (25.00) | 5 (12.82) | 11 (11.58) | 8 (12.70) | 19 (12.03) |
| 1-2 hrs | 44 (61.97) | 30 (62.50) | 30 (76.92) | 63 (66.32) | 41 (65.08) | 104 (65.82) |
| 3-4 hrs | 22 (30.98) | 6 (12.50) | 2 (5.13) | 19 (20.00) | 11 (17.46) | 30 (18.99) |
| 5-6 hrs | 1 (1.41) | 0 (0.00) | 2 (5.13) | 01 (1.05) | 02 (3.17) | 03 (1.89) |
| More than 6 hours | 2 (2.82) | 0 (0.00) | 0 (0.00) | 01 (1.05) | 01 (1.59) | 02 (1.27) |
| Total | 71 (100.00) | 48 (100.00) | 39 (100.00) | 95 (100.00) | 63 (100.00) | 158 (100.00) |

(Note: Numbers in parenthesis indicated percentages)

Table 3 illustrates that majority of the respondents (65.82%) daily spent 1-2 hours on social media followed by 18.99 percent who spent 3- 4 hours, 12.03 percent who spent less than 1 hour, 1.89 percent who spent 5-6 hours and the remaining 1.27 percent spent more than 6 hours in social media. As analysed in the table that 61.97 per cent of Assistant Professors, 62.50 per cent of Associate Professors and 76.92 percent of Professors spent 1-2 hours of time in social media whereas 66.32 percent of Social science and 65.08 percent of Science subject's faculty spent 1-2 hours. That means majority of the Assistant Professors, Associate professors and Professors daily spent 1-2 hours on social media.

. **Table 4:** Channel through which the respondents came to know about the Social Media

| Source | Assistant Professors N=71 | | | Associate Professors N=48 | | | Professors N=39 | | |
|---|---|---|---|---|---|---|---|---|---|
| | F | S | R | F | S | R | F | S | R |
| Self | 54 (76.06) | 15 (21.13) | 02 (2.81) | 24 (50.00) | 21 (43.75) | 03 (6.25) | 11 (28.21) | 25 (64.10) | 03 (7.69) |
| Colleagues | 04 (5.63) | 46 (64.79) | 21 (29.58) | 28 (58.33) | 18 (37.50) | 02 (4.17) | 21 (53.85) | 13 (33.33) | 05 (12.82) |
| Internet/Search Engines | 63 (88.73) | 05 (7.04) | 03 (4.23) | 32 (66.67) | 13 (27.08) | 03 (6.25) | 14 (35.90) | 22 (56.41) | 03 (7.69) |
| Family members | 11 (15.50) | 18 (25.35) | 42 (59.15) | 06 (12.5) | 13 (27.08) | 29 (60.42) | 19 (48.72) | 15 (38.46) | 05 (12.82) |
| Friends | 41 (57.75) | 28 (39.44) | 02 (2.82) | 29 (60.42) | 12 (25.00) | 07 (14.58) | 25 (64.10) | 09 (23.08) | 5 (12.82) |
| News papers/ Magazines/Journals | 08 (11.27) | 57 (80.28) | 06 (8.45) | 13 (27.08) | 27 (56.25) | 08 (16.67) | 11 (28.21) | 15 (38.46) | 13 (33.3) |

(Note: Numbers in parenthesis indicated percentages) F= Frequently, S= Sometimes, R=Rarely

It is evident from Table 4 that most of the Assistant Professors (83.73%) came to know about the social media networks through browsing Internet or search engines frequently followed by 76.06 per cent themselves, 57.75 per cent with friends, 15.50 per cent through family members, and 11.27 per cent through News papers / Magazines/Journals and 5.63 per cent through collegues frequently.It is shown in the table that most of the Associate Professors (66.67%) came to know about the social media networks through browsing Internet or search engines frequently followed by 60.42 per cent with friends, 58.33 per cent through colleagues, 50 per cent themselves, 27.08 per cent through News papers / Magazines/Journals and 12.05 per cent through cfamily members frequently.As presented in the table, most of the Professors (64.10%) came to know about the social media networks through friends frequently followed by 53.85 per cent through colleagues, 48.72 per cent with family members, 35.90 per cent through browsing Internet or search engines and 28.21 per cent themselves and through News papers / Magazines/Journals. That means majority of the Assistant Professors

and Associate professors came to know about the social media networks through browsing Internet or search engines frequently when compared to Professors.

**Table 5:** Place of accessing Social Media

| Access point | Assistant Professors N=71 | | | Associate Professors N=48 | | | Professors N=39 | | |
|---|---|---|---|---|---|---|---|---|---|
| | F | S | R | F | S | R | F | S | R |
| University Library | 1 (1.41) | 26 (36.62) | 44 (61.97) | 2 (4.17) | 9 (18.75) | 37 (77.08) | 2 (5.13) | 11 (28.21) | 26 (66.67) |
| Institute Computer centre | 1 (1.41) | 14 (19.72) | 56 (78.87) | 3 (6.25) | 6 (12.5) | 39 (81.25) | 3 (7.70) | 8 (20.51) | 28 (71.79) |
| Department | 69 (97.18) | 1 (1.41) | 1 (1.41) | 41 (85.42) | 5 (10.42) | 3 (6.25) | 37 (94.88) | 1 (2.56) | 1 (2.56) |
| Home | 66 (93.00) | 3 (4.23) | 2 (2.82) | 40 (83.33) | 4 (8.33) | 3 (6.25) | 30 (76.92) | 7 (17.95) | 2 (5.13) |
| Park/Garden/ Canteen/Travel | 17 (23.94) | 43 (60.56) | 11 (15.50) | 2 (4.17) | 31 (64.58) | 15 (31.25) | 2 (5.13) | 16 (41.03) | 21 (53.84) |

(Note: Numbers in parenthesis indicated percentages) F= Frequently, S= Sometimes, R=Rarely

Table 5 lists the preferred place for accessing social media resources by the Faculty members. It is evident from the table that most of the Assistant Professors (97.18%), Associate Professors (85.42%) and 94.88 per cent of the Professors accessing social media at their department frequently. It can also be observed from the table most of the Assistant Professors (93%) accessing social media at home frequently followed by 83.33 percent Associate Professors and 76.92 per cent of the Professors accessing social media at home. That means majority of the faculty member's preferred department as the place for accessing social media resources/networks frequently.

**Table 6: Type of devices using for Social Media**

| Access point | Assistant Professors N=71 | | | Associate Professors N=48 | | | Professors N=39 | | |
|---|---|---|---|---|---|---|---|---|---|
| | F | S | R | F | S | R | F | S | R |
| Desktop Computers | 58 (81.70) | 11 (15.49) | 2 (2.82) | 39 (81.25) | 9 (18.75) | 0 (0.0) | 18 (46.15) | 17 (33.33) | 4 (10.26) |
| Laptops | 62 (87.32) | 09 (12.68) | 0 (0.0) | 41 (85.42) | 7 (14.58) | 0 (0.0) | 28 (71.79) | 11 (28.21) | 0 (0.0) |
| Smart Phones | 70 (98.59) | 1 (1.40) | 0 (0.0) | 44 (91.67) | 04 (8.33) | 0 (0.0) | 38 (97.44) | 1 (2.56) | 0 (0.0) |
| Tablets | 1 (1.40) | 29 (40.85) | 41 (57.74) | 0 (0.0) | 14 (29.17) | 34 (70.83) | 2 (5.13) | 9 (23.07) | 28 (71.79) |

Note: Numbers in parenthesis indicated percentages) F= Frequently, S= Sometimes, R=Rarely

Table 6 depicts that majority (98.59%) of the Assistant Professors, 91.67 per cent of the Associate Professors and 97.44 per cent of the Professors are preferred smart phones for getting access to social media frequently and also majority of the faculty members are preferred laptops, Desktops frequently when compared to Tablets. That means majority of the faculty member's preferred smart phone device as the main medium for accessing social media resources/networks frequently.

**Table 7:** Use of social media for personal, teaching and scholarly communication

| Social media networks | Respondents (N=158) | | | | | |
|---|---|---|---|---|---|---|
| | Personal | Rank | Teaching | Rank | Scholarly Communication | Rank |
| Facebook | 146 (92.41) | 3 | 10 (6.33) | 9 | 17 (10.75) | 7 |
| Twitter | 07 (4.43) | 13 | 02 (1.26) | 15 | 02 (1.26) | 15 |
| WhatsApp | 158 (100.00) | 1 | 148 (93.67) | 1 | 103 (65.19) | 1 |
| LinkedIn | 32 (20.25) | 6 | 18 (11.39) | 6 | 12 (7.59) | 8 |
| Pinterest | 14 | 8 | 09 | 11 | 04 | 13 |

| | | | | | | |
|---|---|---|---|---|---|---|
| | (8.86) | | (5.70) | | (2.53) | |
| Instagram | 49 (31.01) | 4 | 19 (12.03) | 5 | 07 (4.43) | 10 |
| Academia.com | 06 (3.80) | 14 | 35 (22.15) | 4 | 94 (59.49) | 3 |
| ResearchGate | 02 (1.27) | 15 | 17 (10.75) | 7 | 20 (12.66) | 5 |
| Researcher ID | 11 (6.96) | 11 | 16 (10.13) | 8 | 05 (3.16) | 12 |
| ORCID | 33 (20.89) | 5 | 06 (3.80) | 14 | 11 (6.96) | 9 |
| Mendeley | 12 (7.59) | 10 | 08 (5.06) | 12 | 58 (36.71) | 4 |
| Zotero | 08 (5.06) | 12 | 07 (4.43) | 13 | 19 (12.02) | 6 |
| YouTube | 156 (98.73) | 2 | 145 (91.77) | 2 | 92 (58.23) | 2 |
| Slide Share | 27 (17.09) | 7 | 62 (39.24) | 3 | 06 (3.80) | 11 |
| Google Docs | 19 (12.03) | 9 | 11 (6.96) | 10 | 03 (1.90) | 14 |

(Note: Numbers in parenthesis indicated percentages)

It is evident from the table that all Faculty members preferred and gave first rank with regard to personal use of social media for WhatsApp followed by YouTube (2nd rank), 3rd rank for Facebook, Instagram (4th rank), ORCID (5th rank), LinkedIn (6th rank), Slide Share (7th rank) Pinterest (8th rank), Google Docs (9th rank), Mendeley (10th rank), Researcher ID (11th rank), Zotero (12th rank), Twitter (13th rank), Academia.com (14th rank) and assigned the last rank to Research Gate with 15th rank. As depicted in the table, all faculty members are completely preferred and gave first rank for WhatsApp with regard to social media as a teaching aid followed by YouTube (2nd rank), 3rd rank for Slide Share, Academia.com (4th rank), Instagram (5th rank), LinkedIn (6th rank), Research Gate (7th rank) Researcher ID (8th rank), Facebook (9th rank), Google Docs (10th rank), Pinterest (11th rank), Zotero (12th rank), Mendeley (13th rank), ORCID (14th rank) and assigned the last rank to Twitter with 15th rank. It is observed from the table that, all faculty members are completely preferred and gave first rank for WhatsApp with regard to social media as a major aid for their scholarly communication followed by YouTube (2nd rank), 3rd rank for Academia.com, Mendeley (4th rank), Research Gate (5th rank), Zotero (6th rank), facebook (7th rank), LinkedIn (8th rank), ORCID (9th rank), Instagram (10th rank), Slide Share

(11th rank), Researcher ID (12th rank), Pinterest (13th rank), Google Docs (14th rank).They assigned the last rank for Twitter with 15th rank. That means majority of the faculty members preferred and ranked WhatsApp as the main social media source for their personal, teaching and scholarly communication.

**Table 8:** Reasons for Using Social Media Sites for Scholarly Communication

| Reasons | Respondents (N=158) | | | | | WS | WMS Average (N=158) | Rank |
|---|---|---|---|---|---|---|---|---|
| | SD | D | NAND | A | SA | | | |
| Get in touch with other researchers for Share and Update Knowledge | 07 (4.43) | 11 (6.96) | 14 (8.86) | 97 (61.39) | 29 (18.36) | 604 | 3.82 | 2 |
| Gather suitable information about writing books, papers and to prepare for research proposal | 15 (9.49) | 17 (10.76) | 21 (13.29) | 79 (50.00) | 26 (16.46) | 558 | 3.53 | 4 |
| | **SD** | **D** | **NAND** | **A** | **SA** | | | |
| Disseminate research output easily (papers, books, conference presentations, etc.) | 09 (5.70) | 06 (3.80) | 32 (20.25) | 93 (58.86) | 18 (11.39) | 579 | 3.66 | 3 |
| Easy to retrieve information | 07 (4.43) | 11 (6.96) | 08 (5.06) | 64 (40.51) | 68 (43.04) | 649 | 4.11 | 1 |
| Less Cost | 12 (7.59) | 24 (15.19) | 23 (14.56) | 88 (55.70) | 11 (6.96) | 536 | 3.39 | 5 |

**Note**: (Numbers in parentheses denote percentages; SD-Strongly Disagree, D-Disagree, NAND- Neither Agree Nor Disagree, A- Agree, SA-Strongly Agree)

Table 8 highlights that the reasons for using social media sites for scholarly communication by faculty members. Based on the weighted arithmetic mean the purposes are ranked. It is evident from the table that all respondents completely preferred and gave first rank to 'Easy to retrieve information' followed by get in touch with other researchers for share and update knowledge (2nd rank), disseminate research output easily (papers, books, conference presentations, etc.) (3rd rank), gather suitable information about writing books, papers and to prepare

for research proposal (4th rank). They assigned the last rank for less cost with 5th rank. That means majority of the faculty members preferred the 'easy to retrieve information' is the main reason for their usage of social media.

**Table 9:** Digital communication during COVID-19 Pandemic

| Digital Communication - During COVID-19 | Assistant Professors N=71 | | | Associate Professors N=48 | | | Professors N=39 | | |
|---|---|---|---|---|---|---|---|---|---|
| | More | Same | Less | More | Same | Less | More | Same | Less |
| Text Massages | 21 (29.58) | 41 (57.74) | 9 (12.68) | 19 (39.58) | 21 (43.75) | 8 (16.67) | 12 (30.77) | 21 (53.85) | 6 (15.38) |
| Voice Calls | 41 (57.74) | 23 (32.39) | 7 (9.87) | 23 (47.92) | 18 (37.5) | 7 (14.58) | 23 (58.97) | 11 (28.21) | 5 (12.82 |
| Social Media | 52 (73.24) | 19 (26.76) | 0 (0.00) | 35 (72.92) | 7 (14.58) | 6 (12.5) | 33 (84.62) | 4 (10.25) | 2 (5.13) |
| Video Calls | 49 (69.01) | 19 (26.76) | 3 (4.23) | 24 (50.00) | 17 (35.42) | 7 (14.58) | 27 (69.23) | 11 (28.21) | 1 (2.56) |
| Emails | 24 (33.80) | 47 (66.20) | 0 (0.00) | 21 (43.75) | 18 (37.5) | 9 (18.75) | 26 (66.67) | 13 (33.33) | 0 (0.00) |

(Note: Numbers in parenthesis indicated percentages)

Table 9 exhibits that the digital communication of faculty members with friends, family outside of their household, colleagues, academicians including work-related communication had increased, stayed the same, or decreased for a range of methods since the coronavirus pandemic. Overall, the research shows that a vast increase in digital communication through social media. The data further show that majority (73.24%) of Assistant Professors used social media more often. This was followed video calls (69.01%), Voice Calls (57.74%), Text Messages (29.58%) and Emails (33.80%). The table also indicates that 72.92 per cent of the Associate Professors used social media more often followed by video calls (50%), Voice Calls (47.92%), Text Messages (39.58%) and Emails (43.75%). It is clear that 84.62 per cent of the Professors used social media more often followed by video calls (69.23%), Emails (66.67%), Voice Calls (58.97%) and Text Messages (30.77%). That means majority of the faculty members preferred 'social media' for their digital communication during COVID -19.

**Table 10:** Problems faced while accessing social media

| Problems | Respondents N=158 | | | | | SD | WMS Average (N=158) | Rank |
|---|---|---|---|---|---|---|---|---|
| | SD | D | NAND | A | SA | | | |
| Risks to the lack of privacy information | 12 (7.59) | 21 (13.29) | 15 (9.49) | 89 (56.34) | 21 (13.29) | 560 | 3.54 | 2 |
| Lack of adequate skills | 06 (3.80) | 53 (33.54) | 26 (16.46) | 30 (18.99) | 43 (27.21) | 525 | 3.32 | 4 |
| More time consuming | 11 (6.96) | 25 (15.82) | 17 (10.76) | 93 (58.87) | 12 (7.59) | 544 | 3.44 | 3 |
| Don't know how and what to contribute | 14 (8.86) | 41 (25.95) | 11 (6.96) | 86 (54.43) | 6 (3.80) | 503 | 3.18 | 5 |
| Poor network connectivity/ slow download speed | 8 (5.06) | 22 (13.92) | 9 (5.70) | 74 (46.84) | 45 (28.48) | 600 | 3.80 | 1 |

(Note: Numbers in parenthesis indicated percentages)

It is evident from the Table 10 that the problems faced while accessing social media resources by faculty members for their scholarly communication. Based on the weighted arithmetic mean the purposes are ranked. The table reveals that all respondents completely preferred and gave first rank to poor network connectivity/ slow download speed is the main problem they are facing followed by risks to the lack of privacy information (2nd rank), more time consuming (3rd rank), lack of adequate skills (4th rank). They assigned the last rank for don't know how and what to contribute with 5th rank. That means most of the faculty members facing the problem while accessing social media was to 'poor network connectivity/ slow download speed'.

**Table 11:** Awareness through library about access and use of academic social media sites for scholarly communication

| Awareness through Library | Assistant Professors | Associate Professors | Professors | Total |
|---|---|---|---|---|
| **Yes** | 1 (1.40) | 4 (8.33) | 2 (5.13) | 07 (4.43) |
| **No** | 70 (98.60) | 44 (91.67) | 37 (94.87) | 151 (95.57) |
| **Total** | 71 (100) | 48 (100) | 39 (100) | 158 (100) |

(Note: Numbers in parenthesis indicated percentages)

Table 11 shows the responses with regard to the faculty members getting any awareness programme about access and use of social media networks/resources for scholarly communication through library. It is observed that most (94.87%) of the faculty members according to their academic status replied that they did not getting any awareness programme from library about access and use of social media networks/resources for scholarly communication. However, only 4.43 per cent of the faculty members are responded positively. That means most of the faculty members didn't get any awareness through libraries about access and use of social media networks/resources for scholarly communication.

**Table 12:** Overall satisfaction with Social Media Sites provided for scholarly communication

| Awareness of Social Media | Designation | | | Subject of Study | | Total |
|---|---|---|---|---|---|---|
| | Assistant Professors | Associate Professors | Professors | Social Sciences | Sciences | |
| Very much satisfied | 08 (11.27) | 18 (37.50) | 7 (17.95) | 19 (20.00) | 14 (22.22) | 33 (20.88) |
| Satisfied | 63 (88.73) | 29 (60.42) | 32 (82.05) | 76 (80.00) | 48 (76.19) | 124 (78.48) |
| No comment | 0 (0.0) | 1 (2.08) | 0 (0.0) | 0 (0.0) | 01 (1.59) | 01 (0.63) |
| Total | 71 (100) | 48 (100) | 39 (100) | 95 (100) | 63 (100) | 158 (100) |

(Note: Numbers in parenthesis indicated percentages)

The result in Table 12 reveals that the designation and subject of study wise overall satisfaction of respondents' on social media for their scholarly communication. Out of 158 respondents, a majority (78.48%) of the respondents were satisfied with the social media resources/sites/networks to fulfill their scholarly communication followed by 20.88 per cent of the faculty members were very much satisfied and remaining least number (0.63%) of respondents is neutral in this regard. The table further shows that over 88.73 per cent of Assistant Professors, 62.42 per cent of Associate Professors and 82.05 percent of Professors were satisfied with social media resources/sites/networks to fulfill their scholarly communication whereas 80 percent of Social science and 76.19 percent of Science subject's faculty were satisfied with social media. That means most of the faculty members satisfied with media networks/resources for scholarly communication.

## Findings

1. Majority (83.54%) of the faculty mentioned that they have 'good' awareness on social media.
2. Majority of the respondents (65.82%) daily spent 1-2 hours on social media.
3. Majority of the Assistant Professors (83.73%), Associate Professors (66.67%) and Professors (64.10%) came to know about the social media networks through browsing Internet or search engines frequently.
4. Most of the Assistant Professors (97.18%), Associate Professors (85.42%) and Professors (94.88%) were accessing social media at their department frequently.
5. Most (98.59%) of the Assistant Professors, Associate Professors (91.67%) and Professors (97.44%) were preferred smart phones for getting access to social media frequently.
6. Majority of the faculty members preferred and ranked WhatsApp as the main social media source for their personal, teaching and scholarly communication.
7. Majority of the faculty members preferred the 'easy to retrieve information' is the main reason for their usage of social media.
8. Majority (73.24%) of Assistant Professors, Associate Professors (72.92%) and Professors (84.62%)were preferred 'social media' for their digital communication during COVID -19.
9. All respondents completely preferred and gave first rank to 'poor network connectivity/ slow download speed' is the main problem they are facing.
10. Most (94.87%) of the faculty members according to their academic status replied that they did not getting any awareness programme about access and use of social media networks/resources for scholarly communication.
11. Out of 158 respondents, a majority (78.48%) of the respondents were satisfied with the social media resources/sites/networks to fulfill their scholarly communication.

## Conclusion and Recommendations

The study found that faculty use social media sites to enhance their scholarly communication; for instance, the use of social media allows faculty to follow current researches and to come up with new research ideas. It was also observed that some faculty do not use social media for scholarly communication

because some do not have relevant skills to access scholarly networks and others are not aware of the existence of academic social networks. Therefore, institutions and libraries need to conduct orientation programmes on how to access academic social networks. Another observation made was that the most commonly used social media are WhatsApp, YouTube and Facebook while Academia.edu, Research Gate, ORCID, Mendeley, Slide Share was the least used. Other social media that the study found to be used were LinkedIn, Instagram and Google Docs. This shows that there are more social media platforms that faculty use for scholarly communication.

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# Research Scholars Perception on Open Access Resources: A study in Sri Venkateswara University, Tirupati, A.P

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## Abstract

*This paper examines and analyses the awareness and perception concerning of open access resources among research students of social science, science and Engineering research scholars of Sri Venkateswara University, Tirupati. The study divulges that the majority of the research scholars were aware about open access resources(OAR) and use for their academic and research purpose. The present study focus on knowing about open access resources, using sodhsindhu provided resources and OA resources links provided on SVU central library website and also to know about the purpose of using and the barriers for accessing the open access resources. The study finds that most of the research scholars were aware of e-resources in particularly open access content and using the resources provided in SVU library website along with subscribed e resources. Finally, the scholars suggested that the sources given on the SVU central library website are useful for their research purpose along with the resources subscribed by the INFLIBNET resources.*

## Introduction

Libraries are an extremely required for the researchers for getting the data from grass root level to advanced level of information on a specific area of a subject. The Research scholars spend most of the times to read the primary and secondary sources of the knowledge from libraries. The impact of the covid pandemic effects on education breaks the continuous visits to the library physically. Hence the scholars shift over their habitual and routine physical visits change over to electronic form. They needed the demand driven services from the libraries for getting the access for the library resources and services from the libraries and publication units and as well as in the form the openly available content for continuing their research.

Open access (OA) resources are electronic resources have a distinct role in the academic environment, which are freely available to all user with free of cost throughout the world. E-resources have a distinct role for the Research scholar for their research and need to use from various resources either from subscribed or from various openly available and one can read, download, copy, distribute with

others. These resources are openly available to everyone in various forms like forms such as an openly available e-book, e-databases, e-access repositories, and institutional repositories (I.R's). In the developing countries the economy to purchase more sources for build up the sufficient information providing to its scholars by the libraries is very crucial due to financial crisis and allocation of funds particularly in state universities. Hence, there is a need to explore the alternative ways of collection of data for the scholars for their research purpose is mandatory. Many of the scholars may or may not aware about the open resources. The Sri venkateswara University library given the various open source resources which are useful for the scholars is provided in its webpage (**svulibrary.ac.in.).** Hence, the present study was undertaken to evaluate the awareness and use of its open resource links provided in its website by their scholars.

## Methodology

The research has been conducted with a structured questionnaire for collecting the data from research scholars of Sri Venkateswara University, Tirupati. The structure of the questionnaire has been get ready in such a way that the respondents could easily know the meaning of the asked questions. A total of 100 number of questionnaires bifurcated among the research scholars and the collected 94 out of 100 questionnaires. This constitutes 94 % of the total response rate from the research scholars of Sri ventakeswara University, Tirupati.

## Objectives of the study

1. To know the awareness on open access (OA) resources among research scholars.
2. To know the discipline-wise usage of open access resources among the research scholars.
3. To identify the purpose of using open access resources.
4. To determine the users' perceptions towards the accessing of open access resources at SVU website
5. To determine the satisfaction level of scholars on using open access(OA) resources given at SVU website.
6. To know the barriers facing by the scholars while using open access resources.

## METHODOLOGY

The study purpose to know the awareness and perception towards open access resources among the Research scholars of Sri Venkateswara University, Tirupati in Andhra Pradesh State. Therefore, the survey method adopted for this study. The population of the study consists research scholars of SV University randomly selected and distributed 100 samples and return of 94 from the disciplines of Social sciences, sciences and Engineering. Respondents for the study were selected based

on the random sampling technique. The study mainly based on primary data collected through questionnaires from the scholars. A well designed and structured questionnaire was used to collect the data from the scholars. The questionnaires were distributed among the 100 users and return of 94 in which includes 51 from social sciences, 30 from the sciences and 13 from the Engineering research scholars were received back with 94% response and finally consider for analysis. The questions asked from the open source resources given in the SVU central library website.

**Limitations of the Study**

• This present study covers only the research scholars of the sri Venkateswara university (Tirupati).

• The research Students in Faculty of Arts in sri Venkateswara University.

• The study covers only 94 returned questionnaires out of 100 questionnaires dispense to the recipients.

**Data Analysis**

A Structured questionnaire was distributed among 100 students who are the research scholars of Sri Venkateswara University. The non probability sampling technique method chain-referral sampling has been chosen in collecting data of which 94 were received.

**Table1:** Discipline wise frequency of library visit

| Discipline | Rural Area | Urban Area | Frequency | Percentage |
|---|---|---|---|---|
| Social Sciences | 35 | 16 | 51 | 54.26% |
| Sciences | 24 | 6 | 30 | 31.91% |
| Engineering | 8 | 5 | 13 | 13.83% |
| Total | 67 (71%) | 27 (29%) | 94 | 94 |
| | | | | |

Table-1 shows that research scholars of 51(54.26%) of the frequency from social science, 30 (31.91%) of sciences and 13 (13,83%) of engineering students are in the use of open access resources from Sri Venkateswara University, Tirupati.

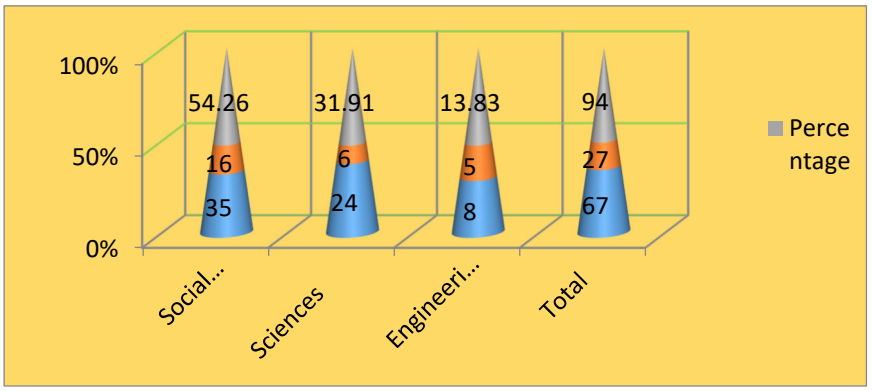



**Figure 1:** Accessing Library resources

Figure -1 shows that 71.27% (67) of the scholars are from Rural areas and 28.72%(27) of the scholars are from urban areas are accessing the Library resources for their academic and research purpose.

**Table2:** Various types of resources

| **Discipline** | **Print** | **Electronic** | **Both** |
|---|---|---|---|
| Social Sciences | 16 (31%) | 4(8%) | 31(61%) |
| Sciences | 4(13%) | 3(10%) | 23(77%) |
| Engineering | 2(15%) | 1(8%)) | 10(77%) |

Table-2 shows that 88% of research scholars of social sciences are using both the resources i.e, print and e-resources for their research and 76.6% and 76.9% are followed by science and Engineering scholars for both resources.

**Table3**Frequencyof library website visit for e- resources

| **Discipline** | **Daily** | **Once in a week** | **Once in fortnightly** | **once in monthly** |
|---|---|---|---|---|
| Social Sciences | 4(8%) | 22(43%) | 7(14%) | 18(35%) |
| Sciences | 1(3%) | 15(50%) | 10(33%) | 4(13%) |
| Engineering | 1(8%) | 8(62%) | 3(23%) | 1(8%) |

Table-3 shows that 64% of social science research scholars visit the library website for accessing the resources at least once in fortnightly and 63% and 85% scholars visit the library website from the science and engineering disciplines.

**Table4**Useof E-Shodh Sindhu

| Discipline | Yes | No |
|---|---|---|
| Social Sciences | 38 (75%) | 13(25%) |
| Sciences | 23(77%) | 7(23%) |
| Engineering | 12(92%) | 1(8%) |

Table-4 shows that 75% of social science research scholars using the Shodh Sindhu resources provided by INFLIBNET for their research and 77% and 92% followed by the science and and engineering disciplines scholars.

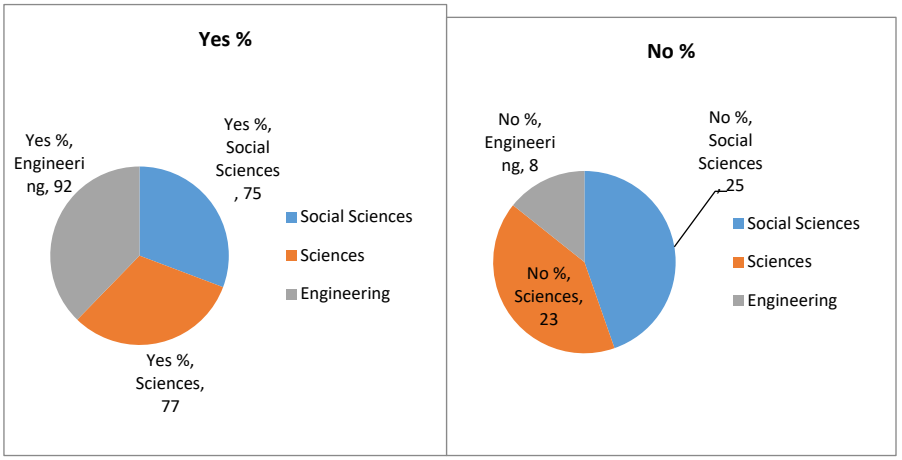



**Figure2:** Use of ShodhSindhu e-resources provided in SVU Library website

Above figures indicates that almost all the scholars accessing the ShodhSindhu e-resources for their research provided by the Inflibnet for gathering the required data.

**Table5:** Consulting the open access resources of SVU website

| **Discipline** | **Yes** | **No** |
|---|---|---|
| Social Sciences | 39 (76%) | 12 (24%) |
| Sciences | 19(63%) | 11(37%) |
| Engineering | 7(54%) | 6(46%) |

Table-5 shows that 76% of the social science scholars are consulting the open access resources provided in the SVU library website and 63% and 54% of the scholars followed by the science and engineering disciplines scholars are using the Open access resources provided in SVU Library website.

**Table6:** Open access resources from SVU library website

| Discipline | Daily | Once in a week | Once in fortnightly | once in monthly |
|---|---|---|---|---|
| Social Sciences | 10 (20%) | 11 (22%) | 10(20%) | 20(39%) |
| Sciences | 6(20%) | 6(20%) | 8(27%) | 10(33%) |
| Engineering | 5(38%) | 1(9%) | 5(38%) | 2(15%) |

Table-6 shows that 62% of the social science scholar's visits the library website for accessing open access resources and 67% and 85% of the scholars followed by the science and engineering disciplines scholars are using the Open access resources provided in SVU Library website.

**Table7:** Purpose of Using Open Access resources

| | Strongly Agree | Agree | Neutral | Disagree | Strongly disagree |
|---|---|---|---|---|---|
| For my research study purpose | 65(69%) | 11(12%) | 7(7%) | 6(6%) | 5(5%) |
| for my course work study | 37(39%) | 28(30%) | 9(10%)) | 6(6%) | 14(15%) |
| For writing article purpose | 32(34%) | 30(32%) | 12(13%) | 8(9%) | 12(13%) |
| for current information on my subject | 42(45%) | 13(14%) | 11(12%) | 15(16%) | 13(14%) |

Table-7: shows that 81% of the scholars are accepted they are using the open access resources for their research purpose 69% of the scholars are using OA resources for their course work purpose. 66% of the scholars agree that they are using OA resources are helpful for are collected data for writing article. 59% of researchers agree that they are getting current information searching from OA resources from SVU website.

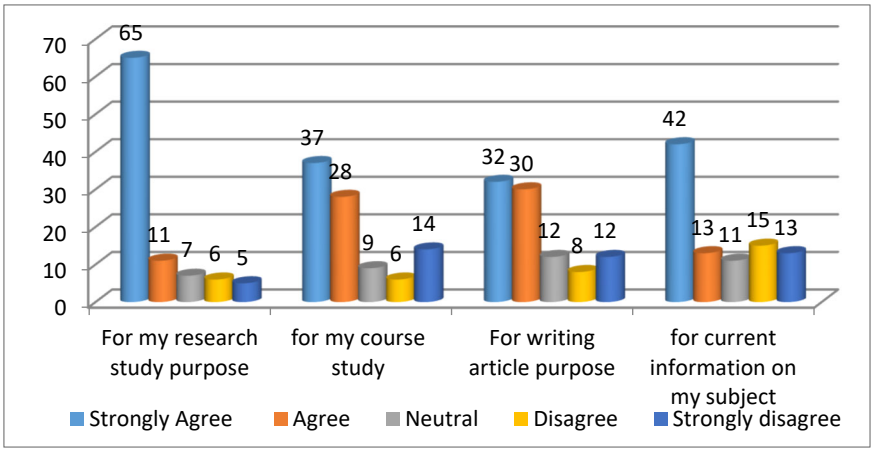



**Figure3:** Purpose of Using Open Access resources

Figure-3 shows that only 30% of the scholars from the engineering discipline were not agreed to use the OA resources provided in the SVU library website and almost all the scholars are using the e- resources given through SVU library website.

**Table7**Usefulness of Open access resource for Research

| OA Resources | Very much | Useful | Moderate | Less useful | Not useful |
|---|---|---|---|---|---|
| e journals | 54(57.45%) | 9(9.57%) | 9(9.57%) | 10(10.64%) | 12(12.76%) |
| e books | 39(41.49%) | 18(19.15%) | 17(18.08%) | 6(6.38%) | 14(14.89%) |
| open ETD | 61(64.89%) | 18(19.15%) | 4(4.25%) | 7(7.45%) | 4(4.25%) |
| online learning websites | 38(40.42%) | 16(17.02%) | 5(5.32%) | 14(14.89%) | 21(22.34%) |
| Online dictionaries | 31(32.98%) | 12(12.76%) | 12(12.76% | 31(32.97%) | 8(8.51%) |

Table-6: shows that 67% of the scholars are accepted they the open journals given on SVU Library website are useful for their research and 60.64% express that e books are useful for their studies. 84% are tells that open theses and dissertations are useful for their research .57.44% are using Open online learning websites and 45.74% are using online free dictionaries given on OA resources from SVU website.

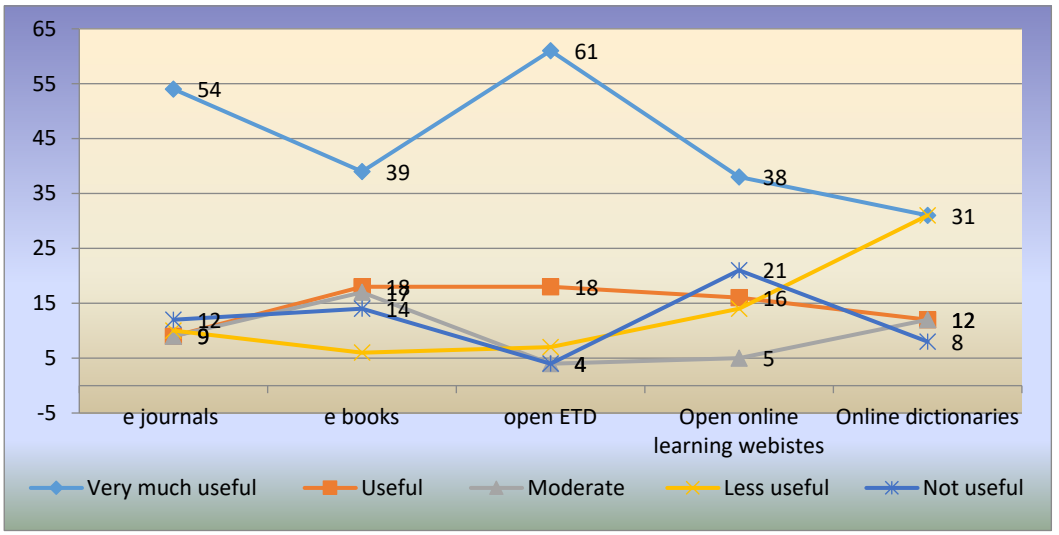



**Figure4:** Usefulness of Open access resource for Research

Figure shows that online dictionaries are little bit less useful for the scholars and the remaining all open access resources are useful for the scholars given on SVU library website.

**Table8:** Satisfaction level on open source resources

| OA Resources | **Extremely Satisfied** | **Very satisfied** | **Moderately satisfied** | **Slightly satisfied** | **Not at all** |
|---|---|---|---|---|---|
| e-books / Open textbooks | 10(11%) | 50 (53%) | 13 (14%) | 8 (9%) | 13(14%) |
| e- journals | 14(15%) | 45(48%) | 12 (13%) | 18 (19%) | 5(5%) |
| Open online databases | 12(13%) | 46 (49%) | 10 (11%) | 13(14%) | 13(14%) |
| Electronic Theses & Dissertations | 21(22%) | 40 (43%) | 11 (12%) | 14(15%) | 8(9%) |
| Bulletins, Reports & indicators | 13 (14%) | 49 (52%) | 10 (11%) | 14(15%) | 8(9%) |
| Online learning resources | 9 (10%) | 39 (41%) | 27 (29%) | 12(13%) | 7(7%) |
| Massive Online Open Courses | 9 (10%) | 48(51%) | 9 (10%) | 11 (12%) | 17(18%) |
| e-Newspapers | 7 (7%) | 40 (43%) | 30 (32%) | 14(15%) | 3(3%) |
| Various open search engines | 13 (14%) | 36 (38%) | 17 (18%) | 19(20%) | 9 (10%) |
| Dictionaries | 3 (3%) | 48 (51%) | 22 (23%) | 11 (12%) | 10 (11%) |

Table-6: shows that scholars of 64% are satisfied with e books and open textbooks, 63% are satisfied with e-journals, 62% with open online databases, 65% with ETDs and 66% are with bulletins, reports and indicators OA resources. The scholars are satisfied with 51% of online learning resources and mooc's courses. 50% are with e news papers. 52% are satisfied with various open search engines. And 54% are with open dictionaries.

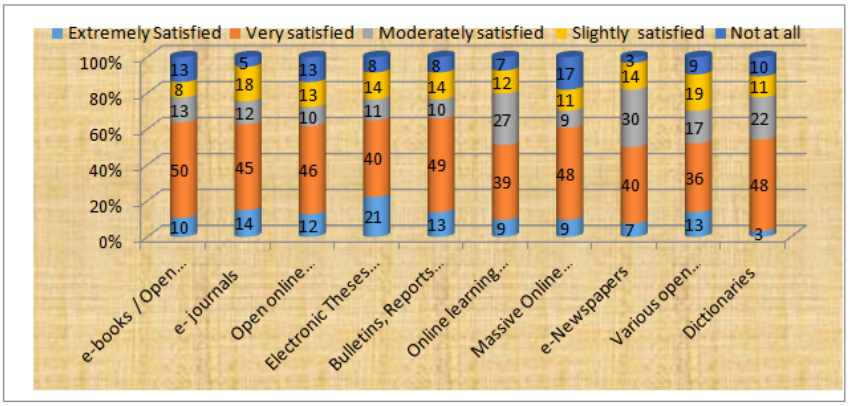



**Figure5:** Satisfaction level on open source resources

The above figure indicates that most of the scholars are using open textbooks, open journals, online databases, etd's and bulletins, reports and indicators.

**Table9:** Problems facing by the research scholars for accessing OA resources

| Problems facing by the scholars | Yes | No |
|---|---|---|
| Lack of awareness | 17(18%) | 76(81%) |
| internet connection & power supply problems | 63(67%) | 30(32%) |
| lack of computer skills for use databases | 65(69%) | 28(30%) |
| Don't have personal computers | 66(70%) | 27(29%) |

Table9: shows that the 81% of the research scholars are aware of open access resources for using for their study and research purpose. 67% of the students express that power problem & internet connection problem and 70% of the scholars didn't have personal computers for accessing the OA resources. 69 % of the scholars need skills of searching the database for proper utilizing the databases.

Significant findings from the study are:

- Almost all the research scholars are aware of electronic resources.

- The frequency of use of e-resources and open access resources among research scholars is once in a weekly and once in fortnightly.
- Maximum of the scholars are using both print and electronic resources for their research.
- 78% of the research scholars are using sodhsindhu resources provided by Inflibnet.
- On average 68.75% of the scholars are agreed to use the OA resources for getting alerts, writing article and doing for their research and course work purpose through SVU library website
- The scholars are mostly using ETD's, e journals and e books available on open access journals for their research and coursework and for writing the articles.
- The scholars satisfied for using the Open access resources available on SVU library website.
- It's found that the research scholars required the skills for searching various databases.
- Need of personal computers and internet connection without interruption of power supply helps more for using the OA resources over internet.

## Conclusions

Most of the scholars on average 71% are from the rural background and 29% are from the urban nativity doing their research in SVU University. It's found that engineering stream scholars are most frequently visits the library website for accessing library resources and fallowed by social science and Science students. Most of the scholars are accessing the sodhsindhu e resources and also consulting the Open access resources provided in SVU Library website.. For the research it's found that the scholars are very much using the online etd, e-journals and e books on priority basis for their research and less use of dictionaries by the scholars from the Open access resources link given on SVU library website. The research scholars are mostly using the e books a, journals, etd's and bulletins, reports and indicators are accessing more than the dictionaries and newspapers. The study express that the research scholar are almost aware of using the e-resources for their research purpose. but they need personal computers with proper internet connection and uninterrupted power supply will help more for using the OA content . Training on skills of using various databases will increases the optimum use of standard open access e-resources available on SVU library website as well as OA content available on Internet.

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# Health Information-Seeking Behaviour of Medical Students during Covid-19 Pandemic: A study

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## Abstract

The study investigated health information needs and seeking behavior of medical students of Kanachur Institute of medical sciences, Mangalore, Karnataka State. This study of the research used questionnaire-based survey method online questionnaire was designed to collect the data from the medical students of Kanachur Institute of Medical Sciences and Research Centre. 130 online questionnaires were distributed in, out of which 113 duly filled in questionnaires were received back. It was found that, the main source of health information during the pandemic was internet with103 (91.1),avast majority (93.9%) of the respondents reported covering their mouths while coughing and sneezing. A major reason for looking for health information during the pandemic was to search for medical information for academic purposes with 108(95.6).

**Keywords:** *information-seeking behavior, Internet, medical education, medical students*

## Introduction

Universal access to information for health professionals is a need to achieve "health for all strategy worldwide"(Tinuoye et.al, 2020). Access to and use of health related information, among medical doctors is important to provide a high quality of health services and to solve various health issues. In their medical practices, "doctors and nurses experience very specific information needs, in relation to which precision, reliability and promptness are fundamental aspects". The need to satisfy health professionals with the right information at the right time is paramount especially in the era of Covid 19.During the pandemic, information is inevitable and important, and having knowledge on pertinent information is very crucial for health-care professionals in order to deliver sustainable and quality health services to their clients, to help in preventing the spread of the virus and to also help in reducing medical errors and ensuring quality health care services.This study is therefore aimed at determining the COVID 19 information seeking behavior of medical students.

## Objectives of the study

- To find out the rreasons for looking for health information during the Covid-19 pandemic

- To find out the ssources of health information during the pandemic
- To find out the reasons for seeking health information during the pandemic
- To know the level of satisfaction toward availability of healthinformation regarding Covid-19
- To establish the problems that medical students encounter in information seeking

## Methodology

This study of the research used questionnaire-based survey method in order to achieve the above objectives. For this purpose a well-structured online questionnaire was designed to collect the data from the medical students of Kanachur Institute of Medical Sciences and Research Centre. 130 online questionnaires were distributed in, out of which 113 duly filled in questionnaires were received back. The collected data were classified, analysed and tabulated by using statistical methods.

## Data Analysis and Interpretation

**Table 1:** Gender of respondents

| Gender | Frequency | Percentage |
|---|---|---|
| Male | 68 | 60.1 |
| Female | 45 | 39.9 |
| Total | 113 | 100 |

From the Table 1 shows the genderwise distribution of respondents. Out of the total of 113 respondents, 68 (60.1%) were males whereas 45(39.9) were females.

**Table 2:** Studying class-Wise Distribution

| Studying class | Frequency | Percentage |
|---|---|---|
| 1st year | 31 | 27.5 |
| 2ndyear | 22 | 19.5 |
| 3rd year | 18 | 16.0 |
| 4th year | 42 | 37.0 |
| Total | 113 | 100.0 |

The Table 2presents that, about 42(37.0)of the students are 4th year MBBS students, followed by 31(27.5) 1st year MBBS students,22(19.5)2nd year MBBS students and remaining 18(16.0) who are 3rd year MBBS students

**Table 3:** Reasons for seeking for health information during the Covid-19 pandemic (multiple responses accepted)

| **Reasons** | **Frequency** | **Percentage** |
|---|---|---|
| Because I ran the risk of getting a particular disease | 62 | 54.8 |
| To search for medical information for academic purposes | 108 | 95.6 |
| Because I want general information on healthy lifestyle | 91 | 80.5 |
| Because I have been diagnosed and want to know more about my illness | 34 | 30.0 |
| To gain better understanding of the causes, severity, and prognosis of a disease | 76 | 67.2 |
| To find information on a specific disease, treatment and drugs/medication | 93 | 82.3 |

As presented in Table 3,a major reason for looking for health information during the pandemic was to search for medical information for academic purposes with 108(95.6), followed by 91(80.5)of the respondents also reported that they looked for health information during the pandemic because they had been diagnosed and want to know more about the illnesses, 76(67.2)of them indicated that to gain better understanding of the causes, severity, and prognosis of a disease and only 08(07.0)of the respondents also reported that they looked for health information during the pandemic because they ran the risk of getting a particular disease.

**Table 4:** Sources of health information during the pandemic (multiple responses accepted)

| Sources | **Frequency** | **Percentage** |
|---|---|---|
| Internet | 103 | 91.1 |
| Social media | 97 | 85.9 |
| Radio/TV | 63 | 55.8 |
| Family/Friends | 21 | 18.6 |
| Dedicated websites of Corona Virus, Govt. of India | 74 | |
| Newspapers (online/print) | | |

In Table4 , the main source of health information during the pandemic was internet with103 (91.1), followed by Social media with 97(85.9),radio/TV with 63(55.8) family/friends with 21(18.6).The finding shows that the internet and the social

media or mass media as major sources of health information to most people.Prominently, Govt. of India has launched antithetic platforms and apps to prevent any panic among the masses because of the fake and unauthentic information and has urged people of India to refer to the information provided on the government websites, and apps suggested, hence, these can be considered as most trusted sources of getting virus-related information.

**Table 5:** Specific topics searched for in the context of COVID-19(multiple responses accepted)

| **Specific topics** | **Frequency** | **Percentage** |
|---|---|---|
| Transmission routes of COVID-19 | 64 | 56.7 |
| Individual measures to protect against infection (e.g., hand-washing tips) | 52 | 46.0 |
| Current spread of COVID-19 (e.g., number of infected cases) | 97 | 85.9 |
| Symptoms of COVID-19 | 106 | 93.9 |
| Dealing with psychological stress caused by COVID-19 | 35 | 31.0 |

Table 5 illustrates that the specific search topics for COVID-19 , the vast majority 106(93.9) of respondents stated that they searched for the Symptoms of COVID-19, whereas 97(85.9)current spread of disease, 64(56.7)sstudents explored the information about transmission routes and 52(46.0)sstudentssearched the information about individual measures to protect against infection (e.g., hand-washing tips).

**Table 6:** Respondents' Healthcare Habits and Practices (multiple responses accepted)

| Opinion | **Frequency** | **Percentage** |
|---|---|---|
| I wash my hands several times in a day | 91 | 80.5 |
| I usually cover my mouth and nose while coughing or sneezing | 106 | 93.9 |
| I follow social distancing whenever I go outside | 67 | 59.2 |
| I use hand sanitizer quite frequently | 84 | 74.3 |
| I monitor my body temperature when I feel unwell | 53 | 46.9 |

Respondents were asked about their healthcare habits and practices during COVID-19 pandemic in the table 6. They were allowed to choose more than one statement from the list provided. As shown in table , a vast majority (93.9%) of the respondents reported covering their mouths while coughing and sneezing, while 91(80.5)of the respondents reported that they used to wash their hands several times a day and used hand sanitizer quite frequently with 84(74.3).The results shows that respondents were maintaining proper personal hygiene and taking good measures to prevent the viral infection from spreading.

**Table 7:** Level of satisfaction towards health information available about COVID-19

| Level of satisfaction | Frequency | Percentage |
|---|---|---|
| Very satisfied | 69 | 61.1 |
| Satisfied | 41 | 36.2 |
| Neutral | 03 | 2.7 |
| Dissatisfied | 00 | 00.0 |
| Very dissatisfied | 00 | 00.0 |
| Total | 113 | 100.0 |

The above table 7 shows that, a large number 69(61.1)of the respondent indicated they were very satisfied towards health information available about COVID-19, whereas 41(36.2)of them stated satisfied and only 3(2.7) of them opined neutral.

**Table 8:** Challenges to health information seeking during the pandemic era.

| Challenges | Frequency | Percentage |
|---|---|---|
| Credibility or authenticity of information on corona virus | 58 | 51.3 |
| Overload of information on the Internet | 32 | 28.4 |
| Lack of uninterrupted power supply | 08 | 7.0 |
| Internet speed is very slow | 15 | 13.2 |
| Total | 113 | 100.0 |

As represented in Table 8, the key challenge that more than half of the respondents reported was Credibility or authenticity of information on corona viruswith58(51.3), followed by 32(28.4) of the respondent indicated Overload of information on the Internet and only 8(7.0)of them indicated Lack of uninterrupted power supply in seeking health information during the pandemic.

## Findings of the study

- Out of the total of 113 respondents, 68 (60.1%) were males whereas 45(39.9) were females.

- about 42(37.0) of the students are 4$^{th}$year MBBS students, followed by 31(27.5) 1$^{st}$ year MBBS students, 22(19.5)2$^{nd}$ year MBBS students and remaining 18(16.0) who are 3$^{rd}$year MBBS students
- A major reason for looking for health information during the pandemic was to search for medical information for academic purposes with 108(95.6), followed by 91(80.5) of the respondents also reported that they looked for health information during the pandemic because they had been diagnosed and want to know more about the illnesses.
- About 76(67.2) of them indicated that to gain better understanding of the causes, severity, and prognosis of a disease and only 08(07.0) of the respondents also reported that they looked for health information during the pandemic because they ran the risk of getting a particular disease.
- The main source of health information during the pandemic was internet with103 (91.1), followed by Social media with 97(85.9), radio/TV with 63(55.8) family/friends with 21(18.6). The finding shows that the internet and the social media or mass media as major sources of health information to most people.
- A vast majority (93.9%) of the respondents reported covering their mouths while coughing and sneezing, while 91(80.5) of the respondents reported that they used to wash their hands several times a day and used hand sanitizer quite frequently with 84(74.3).
- A vast majority (93.9%) of the respondents reported covering their mouths while coughing and sneezing, while 91(80.5) of the respondents reported that they used to wash their hands several times a day and used hand sanitizer quite frequently with 84(74.3). The results shows that respondents were maintaining proper personal hygiene and taking good measures to prevent the viral infection from spreading.
- A large number 69(61.1) of the respondent indicated they were very satisfied towards health information available about COVID-19, whereas 41(36.2) of them stated satisfied and only 3(2.7) of them opined neutral
- The key challenge that more than half of the respondents reported was Credibility or authenticity of information on corona viruswith58(51.3), followed by 32(28.4) of the respondent indicated Overload of information on the Internet and only 8(7.0) of them indicated Lack of uninterrupted power supply in seeking health information during the pandemic.
- The key challenge that more than half of the respondents reported was Credibility or authenticity of information on corona virus with 58(51.3) and only 8(7.0) of them indicated Lack of uninterrupted power supply in seeking health information during the pandemic.

## Conclusion

Being aware of individuals' informational requirements and information seeking behaviors regarding COVID-19 is of paramount importance in performing interventions to reduce the adverse effects of this disease. Seeking apt, accurate and authoritative information is necessary for building-up the knowledge. ICT infrastructures like computer access, computer training and internet access at their workplace with frequent internet use were significant with information seeking on the COVID-19 pandemic. In conclusion, medical students showed expected level of health-seeking behavioural intentions and implemented proper strategies to prevent the spread. To better disseminate the useful information regarding COVID-19 to health-care providers the trusted WHO and EMOH websites are recommended. This study assesses the care providers' information seeking behaviour about COVID-19 information that advocates information dissemination using reliable sources and digital platforms for enabling health professionals to combat COVID-19 pandemic with other supportive stakeholders.

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# Information Seeking Behaviour of Management Students and Their Satisfaction Level with Libraries in Rayalaseema

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## Abstract:

*Information leads the day-to-day activities of the people. Everyone use information for their personal, societal and official needs. Effective usage of information determines the level of satisfaction on the fulfilment of needs. The perspective and effective usage of information depends upon the attitudes, otherwise called as behaviours that the information seeker applies in the process of seeking information. The application of behaviours in the information seeking process becomes complex in a situation where the flow of information in print, digital and visual forms are enormous. The appropriate application of attitude will enable the seeker not to be caught among the overflow of information, especially with irrelevant information. The libraries especially in management institutions play a vital role in providing information related to academic, research and general aspects. These libraries provide various resources such as books, periodicals, back volumes, patents, standards, projects, thesis, newspapers etc. Libraries facilitate access to these resources through print, digital and visual modes.*

**Keywords**: *Facilities, Access, Availability, Management, Periodically*

## Introduction:

Information explosion has paved the way to seek information in increasing variety and diversity at different levels, frequency, volume and use. This situation appears to be ambiguous and heterogeneous in character so that information needs of a particular group of users and information flow from a specific situation / organization are different to determine. The present era is the era of information and knowledge revolution. The increase in information available on the Web has greatly affected information seeking behavior. In Wilson's (1981, 1997) models, information-Seeking behaviour stems from a perceived need for information by the user. In response to this need, the user will place demands on the information system (e.g. library or database) and on other sources of information (e.g. textbook, lecturer, handouts and suchlike). Information needs do not operate in a vacuum but

in particular context. The context includes the person (physiological, the effective and cognitive states), the role (the student) and his or her environment. Very few studies draw a distinction between undergraduate users in different years of their studies in a particular discipline. A questionnaire was designed in an effort to understand how students are responding to the changing methods of information dissemination and to enable attention and resources to be directed and targeted where possible to meet those needs. Information behaviour encompasses information seeking as well as the totality of other unintentional or passive behaviours (such as glimpsing or encountering information) as well as purposive behaviours that do not involve seeking, such as avoiding information (Case, 2002). According to Krikelas (1983) information seeking behaviours refers to — any activity of an individual that is undertaken to identify a message that satisfies perceived needs.

**Objectives:**

1) To know Management students library needs in general
2) To identify their information seeking behaviour in various dimensions.
3) To measure their satisfaction level in this regard.
4) To suggest how to improve library services in this regard.

**Hypotheses:**

1. There is no association between reasons for information need of the students of business management from universities in Rayalaseema and gender of the respondents.
2. The level of satisfaction of the students on library collection and services are not correlated to each other in their pursuit of academic.

**Scope of the Study**

.The scope of the research is referred to as the location of the study. One of the primary goals of any library is to satisfy users information needs. In a university library, a thorough understanding of the information needs and seeking behaviour of students, academic staff is fundamental for effectively supporting their academic. Such an understanding is expected to help develop library collections and services that are more likely to satisfy their information needs. This study helps provide such an understanding

**Sample:**

Sample of 627 Management students opinions was gathered with the help of structured questionnaire in entire Rayalaseema region.

## Selection of Sample

In this study, sampling is carried out in two stages. Hence, random sampling method is adopted in this study.

## Data Analysis:

## Age and Gender wise Distribution of respondents

A question has been asked to the respondents to know their gender and age group. The respondent's information is provided in Table .1

**Table 1:** Distribution of sample respondents Age and Gender wise

| Age | Gender | | |
|---|---|---|---|
| | **Male** | **Female** | **Total** |
| **21-22** | 205 (50.6) | 178 (80.2) | 383 (61.1) |
| **23-24** | 140 (34.6) | 33 (14.9) | 173 (27.6) |
| **25-26** | 37 (9.1) | 10 (4.5) | 47 (7.5) |
| **Above 27 Years** | 23 (5.7) | 1 (0.5) | 24 (3.8) |
| **Total** | **405 (100)** | **222 (100)** | **627 (100)** |

**Source:** Compiled from the Data Collected from Field Work.

(Figures in parenthesis represent percentage)

| Between respondents | Chi-Square Value | Probability value | Degrees of freedom | Table value | Level of Significance |
|---|---|---|---|---|---|
| **Age- Gender** | 55.037 | 0.000 | 3 | 11.345 | Significant at 0.01 Level |

**Source:** Compiled from the Data Collected from Field Work.

It is observed from Table 1 that total respondents of the present study are 627. Further, it is observed from the above table that 61.1% of respondents are of the age-group of 21-22years, 27.6% are of the age group of 23-24years, 7.5%are of the age group of 25-26 years and the remaining 3.8% are of the above 27 years of age. From the chi-square output table we see that significance level of 99 % has

been achieved. This means that chi-square table is showing systematic association between the above two variables at 99 % level of confidence. Hence it conclude that there is significant relationship between age and Gender wise respondents.

A question has been put to the respondents to know their gender wise distribution of response. The respondents information is provided in Table-2

**Table 2:** Semester and Gender-Wise Distribution of Respondents

| Semester | Gender | | |
|---|---|---|---|
| | **Male** | **Female** | **Total** |
| **I semester** | 0 (0.0) | 0 (0.0) | 0 (0.0) |
| **II semester** | 205 (50.6) | 117 (52.7) | 322 (51.4) |
| **III semester** | 0 (0.0) | 0 (0.0) | 0 (0.0) |
| **IV Semester** | 200 (49.4) | 105 (47.3) | 305 (48.6) |
| **Total** | **405 (100)** | **222 (100)** | **627 (100)** |

**Source:** Compiled from the Data Collected from Field Work.

(Figures in parenthesis represent percentage)

| Between respondents | Chi-Square Value | Probability value | Degrees of freedom | Table value | Level of Significance |
|---|---|---|---|---|---|
| **Gender – Basic qualifications** | 0.25 | 0.617 | 1 | 3.84 | Not Significant |

**Source:** Compiled from the Data Collected from Field Work.

It is evident from the above table that all the respondents belong to either II Semester or IV Semester MBA students from different universities. It shows that out of 322(51.4%) of respondents are from II Semester and the remaining 305(48.6%) of respondents are from IV Semester. It is observed in the case of gender that majority of male (50.6%), female (52.7%) respondents are from II Semester followed by (49.4%) of male and (47.3%) of female respondents are from IV Semester MBA. The chi-square results shows that there is significant difference

Gender and basic qualifications. The calculated chi-square values 0.25 is less that the table value which is 3.84 (See table no. 5.3). This means that chi-square table is showing systematic association between variables at which is not significant.

A question has been put to the respondents to know the type of information they seek related to their subject cover. The respondent information is provided in Table 3.

**Table 3:** Type of Information Respondents Seek Related to their Subject **Cover.**

| Information type | Gender | | Universities | | | | Grand Total (N=627) |
|---|---|---|---|---|---|---|---|
| | Male (n=405) | Female (n=222) | RU (n=81) | SKU (n=158) | SVU (n=216) | YVU (n=172) | |
| Market research | 104 (25.6) | 73 (18.0) | 25 (31.4) | 18 (11.3) | 93 (43.0) | 41 (23.6) | 177 (28.2) |
| Financial information | 173 (42.7) | 141 (34.8) | 14 (17.6) | 67 (42.2) | 140 (64.9) | 93 (53.9) | 314 (50.1) |
| Economic news/ trends | 86 (21.2) | 26 (6.4) | 29 (35.3) | 39 (24.7) | 24 (11.0) | 21 (12.3) | 112 (17.9) |
| Industry information | 151 (37.3) | 69 (17.2) | 35 (43.1) | 47 (29.8) | 25 (11.7) | 113 (65.7) | 220 (35.2) |
| Company information | 253 (62.6) | 98 (24.2) | 49 (60.7) | 89 (56.6) | 110 (50.8) | 104 (60.5) | 352 (56.2) |
| Business news | 242 (59.7) | 142 (35.1) | 47 (58.0) | 119 (75.3) | 100 (46.2) | 118 (68.6) | 384 (61.2) |
| Business intelligence | 170 (42.0) | 53 (13.1) | 43 (52.9) | 91 (57.6) | 47 (21.9) | 42 (24.6) | 223 (35.6) |
| Analyst reports/ Trends Reports | 74 (18.3) | 42 (10.4) | 22 (27.4) | 20 (12.3) | 46 (21.1) | 29 (17.0) | 117 (18.6) |
| Statistical information | 101 (25.0) | 50 (12.3) | 6 (7.8) | 24 (15.4) | 76 (35.2) | 44 (25.5) | 151 (24.0) |
| Consumer trends/ Information | 51 (12.6) | 31 (7.7) | 17 (21.6) | 5 (3.1) | 32 (14.9) | 28 (16.1) | 82 (13.1) |
| Regulatory news | 78 (19.3) | 17 (4.1) | 10 (11.8) | 28 (17.5) | 37 (17.2) | 21 (12.3) | 95 (15.2) |
| Stock market trends/ Shares and debentures | 84 (20.9) | 37 (9.2) | 19 (23.5) | 24 (15.2) | 52 (24.1) | 27 (15.7) | 122 (19.5) |

(Respondents are permitted to tick more than one answer)

('n' values indicate total number of respondents taken from the concerned university)**Source:** Compiled from the Data Collected from Field Work.

(Note: Figures in parenthesis represent percentage)

It is observed from table 5.28 that the type of information respondents wants to seek from the libraries. Majority (61.2%) of the respondents use to know the

Business news, followed by (56.2%) to obtain the Company information, (50.1%) to know the Financial information, (35.2%) to learn Business intelligence, (35.2%)to know Industry information, (28.2%)to know the Market research, (24.0%)to know the Statistical information, (19.5%)to improve the knowledge regarding Stock market trends/ Shares and debentures,(18.6%) to know Analyst reports/ Trend reports, (17.9%) to know Economic news /trends, (15.2%)to know Regulatory news and (13.1%)to know the Consumer trends/ Information.

**Hypothesis: 1**

$H_0$: The reasons for information need of the students of business management from universities in Rayalaseema are independent of their universities and gender wise.

**Table 4:** Distribution of Respondents Opinion with Regard to Reasons for Information Need of the Students for Day to day Work.

| Reasons for information need of the students | Respondents | | | | | | Grand Total (N=627) |
|---|---|---|---|---|---|---|---|
| | Male (n=405) | Female (n=222) | RU (n=81) | SKU (n=158) | SVU (n=216) | YVU (n= 172) | |
| Information about previous work done in the field | 194 (47.90) | 94 (23.21) | 29 (35.80) | 89 (56.33) | 113 (52.31) | 57 (33.14) | 288 (45.93) |
| Information about current development in business and management | 313 (77.28) | 218 (53.83) | 58 (71.60) | 141 (89.24) | 198 (91.67) | 134 (77.91) | 531 (84.69) |
| Information about scientific or business data | 122 (30.12) | 102 (25.19) | 32 (39.51) | 63 (39.87) | 78 (36.11) | 51 (29.65) | 224 (35.73) |
| Information on Extension activity | 147 (36.30) | 107 (26.42) | 39 (48.15) | 65 (41.14) | 87 (40.28) | 62 (36.05) | 253 (40.35) |
| Information on recent and ongoing research project/Programmes | 221 (54.57) | 136 (33.58) | 49 (60.49) | 99 (62.66) | 137 (63.43) | 72 (41.86) | 357 (56.94) |
| Information on fourth coming conferences/seminars workshops etc | 273 (67.41) | 153 (37.78) | 51 (62.96) | 102 (64.56) | 161 (74.54) | 112 (65.12) | 426 (67.94) |
| Information on scholarship/ fellowship | 179 (44.20) | 122 (30.12) | 40 (49.38) | 84 (53.16) | 107 (49.54) | 70 (40.70) | 301 (48.01) |

Respondents are permitted to tick more than one answer) **Source:** Compiled from the Data Collected from Field Work.

(Note: Figures in parenthesis represent percentage)

| Between respondents | Chi-Square Value | Probability value | Degrees of freedom | Table value | Level of Significance |
|---|---|---|---|---|---|
| Male-Female | 12.99 | 0.04 | 6 | 12.59 | Significant at 0.05 Level. |
| RU-SKU | 5.50 | 0.48 | 6 | 12.59 | Not significant |
| RU-SVU | 6.27 | 0.39 | 6 | 12.59 | Not significant |
| RU-YVU | 5.73 | 0.45 | 6 | 12.59 | Not significant |
| SKU-SVU | 2.23 | 0.90 | 6 | 12.59 | Not significant |
| SKU-YVU | 8.56 | 0.20 | 6 | 12.59 | Not significant |
| SVU-YVU | 5.13 | 0.53 | 6 | 12.59 | Not significant |

**Source:** Compiled from the Data Collected from Field Work.

Table 5.19 clearly explains most of the (84.69%) expressed that they need information about current development in business and management followed by (67.94%) opined that they require information on fourth coming conferences/seminars workshops etc, (56.94%) for Information on recent and ongoing research project/Programmes, and only (35.73%) opined that they need information about scientific or business data. Most of the male respondents (77.28%) need the information about previous work done in the field, whereas female respondents (53.83%) opined that they need information about current development in business and management.

It is clear that (71.60%) of Rayalaseema University, (89.24%) of Sri Krishnadevaraya University, (91.67%) of Sri Venkateswara University, (77.91%) of Yogi Vemana University respondents need information about current development in business and management.

Table 5.19 shows the calculated chi-square values and table values regard the respondents opinion with regard to types of information seeking for day to day work. The table shows that in case of the male-female the chi-square value is 12.99 where as the table value is 12.59 which shows it is significant at 0.05 Level. In case of the Rayalaseema University -Sri Krishnadevaraya University, Rayalaseema University -Sri Venkateswara University, Rayalaseema University –Yogi Vemana University , Sri Krishnadevaraya University -Yogi Vemana University, Sri Venkateswara University -Yogi Vemana University and Sri Krishnadevaraya University -Sri Venkateswara University the chi-square values and table values shows that they are not significant

The data collected from the respondents were analyzed and presented in the table-4.19. Chi-square test is used to verify the hypothesis. From the chi-square output table we see that significance level of 95% has been achieved. This means that chi-square table is showing systematic association between the above two variables. Hence null hypothesis is rejected and at 95 % level of confidence we conclude that there is significant relationship between gender of the students and reasons for information need of the students of MBA. In another dimension universities wise chisquare output table we see that significance level has not been achieved. This means that chi-square table is showing not systematic association between the above two variables. Hence null hypothesis is accepted. Hence, it conclude the reasons for the needs of MBA students in the universities of rayalaseema region are not significantly different.

**Hypothesis: 2**

$H_0$: The level of satisfaction of the students on library collection is independent of the library collection used by them.

The data collected from the respondents are analyzed presented in the table-4.34 and the null hypothesis is verified with ANOVA (one way). The ANOVA used for studying the differences among the influence of various categories of one independent variable on a dependent variable is called one-way ANOVA. The ANOVA is designed to test whether a significant difference exists among three or more sample means. In this analysis, the total variance in a set of data is divided into variation within groups and variation between-groups4. The analysis of variance technique is used when independent variables are of nominal scales and dependent variables are metric or least interval scaled.

**Satisfaction of your University Library Services**

**Level of Performance of Services Offered by in your University Library**

A question has been asked the respondents to know their level of performance of services offered in your university library. The respondent information is provided in4.

**Table 5:** Level of Performance of Services offered by in your University Library.

| Library Services | Gender | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | Male | | | | | Female | | | | |
| | VQ | AQ | SADQ | INAD | VADQ | VQ | AQ | SADQ | INAD | VADQ |
| Lending of books | 179 (44.2) | 75 (18.5) | 88 (21.7) | 63 (15.6) | 0 (0.0) | 111 (50.0) | 47 (21.2) | 44 (19.8) | 18 (8.1) | 2 (0.9) |
| Bibliographical services | 55 (13.6) | 164 (40.5) | 121 (29.9) | 59 (14.6) | 6 (1.5) | 58 (26.1) | 73 (32.9) | 48 (21.6) | 37 (16.7) | 6 (2.7) |
| Reprographic service | 19 (4.7) | 81 (20.0) | 187 (46.2) | 84 (20.7) | 34 (8.4) | 19 (8.6) | 56 (25.2) | 94 (42.3) | 37 (16.7) | 16 (7.2) |
| Translation service | 26 (6.4) | 80 (19.8) | 105 (25.9) | 157 (38.8) | 37 (9.1) | 20 (9.0) | 37 (16.7) | 82 (36.9) | 69 (31.1) | 14 (6.3) |
| CD-ROM data base services | 22 (5.4) | 68 (16.8) | 112 (27.7) | 99 (24.4) | 104 (25.7) | 18 (8.1) | 34 (15.3) | 96 (43.2) | 42 (18.9) | 32 (14.4) |
| Ready Reference service | 58 (14.3) | 69 (17.0) | 99 (24.4) | 135 (33.3) | 44 (10.9) | 37 (16.7) | 47 (21.2) | 72 (32.4) | 52 (23.4) | 14 (6.3) |
| Current Awareness Services | 70 (17.3) | 10 (27.2) | 100 (24.7) | 98 (24.2) | 27 (6.7) | 35 (15.8) | 57 (25.7) | 60 (27.0) | 48 (2.6) | 22 (9.9) |
| Selective Dissemination of Information | 36 (8.9) | 103 (25.4) | 170 (42.0) | 63 (15.6) | 33 (8.1) | 21 (9.5) | 82 (36.9) | 57 (25.7) | 43 (19.4) | 19 (8.6) |
| Internet services | 61 (15.1) | 145 (35.8) | 93 (23.0) | 60 (14.8) | 46 (11.4) | 24 (10.8) | 62 (27.9) | 73 (32.9) | 41 (18.5) | 22 (9.9) |
| Other services | 93 (23.0) | 125 (30.9) | 86 (21.2) | 46 (11.4) | 55 (13.6) | 39 (17.6) | 83 (37.4) | 42 (18.9) | 40 (18.0) | 18 (8.1) |

**Source:** Compiled from the Data Collected from Field Work.

Note: Figures in parentheses denote percentages; VQ- Very Adequate, A-Adequate, SADQ- SOMEWHAT

ADEQUATE, INAD –INADEQUATE; VADQ- VERY INADEQUATE

Regarding the opinion on level of performance of services majority (44.2%) of male respondents expressed that the service of lending of books is very adequate whereas (40.5%) said that bibliographical services are adequate, and (46.2%) of them expressed that reprographic services are somewhat adequate, and (38.8%) of them said that translation services are inadequate, (25.7%) said that CD-ROM

database services are inadequate. 50% of female respondents opined that the service of lending of books is very adequate, followed by 32.9% bibliographical services with adequate, 42.3% of female respondents have expressed that reprographic services are somewhat adequate, 31.1% of inadequate services on translation services and a few respondents opined that very inadequate services are there.

It is identified from the table that the p-value is less than 0.05 ($p<0.05$); and the results are significant. Hence, the hypothesis that "there is no significant difference between the universities wise and the level of satisfaction in the library collections is disproved. This shows that there is significant difference between universities wise and the level of satisfaction of the students in the library collection the alternative hypothesis proposed is

## DISCUSSION OF RESULTS:

The results of present report describes that a clear understanding about the information needs and information seeking behaviour of students and research scholars is essential to expand the existing information and library services in the universities of Rayalaseema region. It is evident from this study that information and library services for students need to be strengthened to suit information needs and variations in information gathering and to provide the type of service that would be most useful for both students and research scholars. The majority of users need effective collection of text books, journals, periodicals and magazines. It is also noted that a considerable number of respondents also visited certain other libraries; it is understandable that no one library can acquire all materials produced in a particular discipline.

Procurement of latest Text books and withdrawal of the outdated Text books is suggested; Improve the latest collection of journals and magazines; Subscribing more periodicals in the Library is very much useful to students reference purpose; Respondents also suggested that proper arrangement and cleaning dust on the documents is necessary; Qualified staff should be appointed for maintaining for effectiveness of library; The documents should be procured in multiple numbers; Making the online public access catalogue is more useful to the library users, without wasting of time they could know the availability of documents. Some suggested that in the time table one library period should be included on library utilization.

**Improvement of Library services by:**

- Providing internet facility in the library.
- Providing the Photostat facility.

- Improving Internet facility.
- Improving the Photostat facility.
- Improve drinking water and toilet facilities.
- Providing Inter library loan facility.

The study also discovered that most of the students aren't aware of the available resources and the means of using information retrieval tools. Resources should be properly organised and guided by way of establishing latest arrival racks at different places in the library, proper advertisement of resources etc .It is also suggested that library professionals ought to train the students within the e-environment as per the changing needs and should guide them in using varied information retrieval tools with efficiently.

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# A Study on Information Needs and Information Seeking Behavior of Academic Community In K.S.R.M. College Of Engineering (A), Kadapa- A Study

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## Abstract

*Information is become an essential requirement of modern existence. Information is essential for anything and everything. A variety of sources can be used to collect or retrieve information. At all times, libraries act as a hub for getting the appropriate information to the right people. User studies must be regarded as a critical component of information packages. Information providers, such as libraries and information centers, must be aware of their users' information requirements as well as their information seeking and retrieval methods in order to provide better services. The purpose of this research is to investigate how users seek information in the K.S.R.M. College of Engineering (Autonomous) Library, Kadapa.*

**Keywords:** *Information seeking behavior, library resources*.

## Introduction

Information gathering is a basic task that everyone engages in and is manifested in a certain manner of behaving. Personal motives for gathering information, the types of information sought, and the procedures and sources used to obtain essential information all play a role in information seeking behavior. Reading written material, study, and testing are all examples of information seeking activity. Research Scholars, learners, and lecturers actively seek current knowledge from encyclopedias, periodicals, and, more recently, electronic media, which are all available in libraries. Users of information are having trouble recognizing and practically locating the information they need when they need it. In this scenario, libraries, as knowledge repositories and learning centers, have a larger duty for delivering the appropriate data to the appropriate user at the correct time and in the

right format, allowing the information to be put to the best possible use, hence boosting information usage. To do this, libraries/information centers must be organized and constructed around the needs and preferences of library users.

## Objectives of the Study

The objectives of this present study are

- To find out the level of usage of library visit.
- To find out the usage of information sources in the library.
- To find out the pattern of information searching in the library.
- To find out the opinion about the usage of ICT facilities in the library.
- To find out the purpose of accessing the information sources in the library.

## Sample of the Study

The researcher delivered 260 questionnaires to the lecturers and students of K.S.R.M. College of Engineering (A), Kadapa academic community. Only 210 completed surveys were received by the researcher, who used them for analysis and interpretation.

## Methodology

Lecturers and students from K.S.R.M. College of Engineering (A), Kadapa, who are associated with JNTUA, Ananthapuramu, were participated in this study. The information gathered by the survey was submitted to descriptive statistical analysis. The percentage analysis was used to examine the replies to the questionnaire item.

## Analysis of the Study

**Table 1** Library Visit

| S. No | Periodicity | Frequency | Percentage |
|---|---|---|---|
| 1 | Daily | 77 | 36.66 |
| 2 | Weekly Once | 39 | 18.59 |
| 3 | Weekly Twice | 28 | 13.33 |
| 4 | Fortnightly | 34 | 16.19 |
| 5 | Monthly | 32 | 15.23 |
| | **Total** | **210** | **100.00** |

Table 1 shows that, the respondents were asked to indicate how often they visited the library. 36.66% of the respondents visited the library daily, followed by 18.59% at once in a week, 13.33% at twice a week, 16.19% Fortnight once and 15.23% at once in a month.

**Table 2** Usages of Information Sources

| S. No | Sources | Frequency | Percentage |
|---|---|---|---|
| 1 | Text Books | 163 | 77.61 |
| 2 | Reference Books | 154 | 73.33 |
| 3 | Periodicals | 142 | 67.61 |
| 4 | e-Journals | 131 | 62.38 |
| 5 | e-Books | 136 | 64.76 |
| 6 | e- Conference Proceedings | 94 | 44.76 |

(Multiple answers were allowed)

Table 2 shows that, 163respondents using textbooks, followed by 154 respondents referring reference books, 142 respondents using periodicals, 131 respondents refers e-Journals, 136 respondents refers e-books, and 94 respondents refer e-Conference Proceedings.

**Table 3**Pattern of Information Search in the Library

| S. No | Search Pattern | Frequency | Percentage |
|---|---|---|---|
| 1 | OPAC | 138 | 65.71 |
| 2 | With help of Library Staff | 43 | 20.49 |
| 3 | Searching in the Shelves | 29 | 13.80 |
| | **Total** | **210** | **100.00** |

Table 3 shows that, 65.71% of the respondents searching the information using OPAC, 20.49% of the respondents directly ask the help of Library staff, and 13.8% of the respondents searches books directly in the shelves.

**Table 4** Opinion about the Usage of Library facilities

| S. No | Response | Facilities in the Library | |
|---|---|---|---|
| | | Internet | Reprographic |
| 1 | Very Good | 179 (85.25) | 182 (86.70) |
| 2 | Satisfied | 24 (11.42) | 26 (12.38) |
| 3 | Not Satisfied | 7 (03.33) | 02 (0.92) |
| | **Total** | **210 (100.00)** | **210 (100.00)** |

Table 4 shows that, 85.25% of the respondents responded Internet facility is Very good, 86.7% responded reprographic facility is also very good in the library. 11.42 % of the respondents felt satisfactory about the Internet facility and 12.38% are satisfied about the reprographic facility available. 3.33% and 0.92% are not satisfied about the Internet/Reprographic facilities available in the library.

**Table 5** Purpose of accessing Information Sources

| S. No | Purpose | Frequency | Percentage |
|---|---|---|---|
| 1 | Preparing for Semester Exams | 182 | 86.66 |
| 2 | Preparing for Assignments | 156 | 74.28 |
| 3 | Preparing for Competitive Exams | 174 | 82.85 |
| 4 | General Awareness purpose | 169 | 80.47 |
| 5 | Preparing for Seminar/Conference | 152 | 72.38 |

(Multiple answers were allowed)

Table 5 shows that, 86.66% of respondents visiting library for preparing for end semester exams, 74.28% of respondents visiting library for preparing assignments, 82.85% of the respondents visiting library for preparing competitive exams, 80.47% of respondents visits the library for the general awareness purpose and 72.38% of the respondents visits the library for preparing Seminar/ conference.

## Major findings of the study

- 36.66% of the respondents visits library every day.
- 77.61% of the respondents visit the library for referring/borrowing Textbooks.
- 65.71% of the respondents use OPAC service for searching.
- 179 and 182 respondents are very happy with the internet and reprographic facilities available in the library.
- 86.66% of the respondents visit the library for preparing semester examinations.

## Conclusion

According to the findings, the academic community has a wide range of information from many sources for various reasons, making it difficult to retain support for a single official information channel. The most commonly utilized sources were those that were easily accessible on a physical, functional, and intellectual level. Users prefer to choose information sources that they are familiar with and that are also conveniently available, regardless of the content's quality. Information may be sought for a specific reason in a specific situation, or it may be gathered in advance because it is anticipated to be valuable. It is most useful when it meets a very particular requirement. In light of the foregoing, it is reasonable to conclude that the individual's working culture, the importance placed on obtaining information, the facilities available for obtaining it, knowledge of these facilities, value judgments, and the likelihood of obtaining what is desired are all factors that may influence information seeking behavior. As a consequence of the research,

students and faculty members at the K.S.R.M. College of Engineering (A) has begun to use the library's materials and services.

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# Use and Impact of open E-resources for College students in Pandemic period special reference to Pollachi

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## Abstract

*The present study is Use and Impact of Open E-Resources for college students in Pandemic Period special reference to Pollachi taluk. The major objectives if the study is to determine the usage and impact of open access resources, purpose and reason for using open access resources, level of satisfaction and perception towards open access resources in pandemic period.. Data were collected from students at Pollachi taluk. The study reveals that the majority of the respondents were fully aware about open access resources and using for learning purpose*.

Key words: *pandemic period, Open e-resources, college students*.

## Introduction

A lot of Publishers and vendors have taken helpful initiatives. In the academic field many publishers have provided open access to relate Covid-19. Others have facilitated access by making it easier to log-in and access materials from outside of official networks. In this situation open e resource is most and essential in the modern society because everyone can access everywhere. Open E resources include e journal, e books, e thesis, e newspaper and electronic online databases. The National Digital Library of India, E pg Pathshala, J Store, E-Acharya, DLA, Oxford University Press also focused strongly on building its offer of online materials, sage, Macmillam, Science publications Bentham Science are available online for free for the benefit of students.

## Objectives

To determine awareness of open access resources

To explore the use of open access resources

To ascertain the frequency of use of open access resources and

To indentify the Purpose of using open access resources

To study the satisfaction level of users.

## Scope of the Study

The scope of the present study is to examine the open access e resources in the College students at Pollachi

## Tools used for Data Collection

The data collected through on line. Questionnaire was feed into tables and simple statistical tools were used for the calculation of average and percentages. Tables were used for analysis and interpretation of the data collection.

## Methodology

For the present study, questionnaire was used for online data collection. A random sampling technique was adapted to selected six college Students at Pollachi Taluk. Collected the questionnaires through email and What's App, I have received 280 data's.

## Data Analysis

**Table 1** Distribution of respondents according to the gender wise

| Gender | Respondents | Percentage |
|---|---|---|
| Male | 158 | 56 |
| Female | 122 | 44 |
| Total | 280 | 100 |

The above table details the number and percentage of Male and Female respondents selected for this study. 280 respondents 158 [56 %] are male and 122 [44 %] are female respondents. This clears that the male respondents were exceeding than male respondents with the count of 12.

**Table 2** Distribution of respondents according to the educational qualifications

| Qualification | Respondents | Percentage |
|---|---|---|
| UG | 172 | 61 |
| PG | 108 | 39 |
| Total | 280 | 100 |

The above table clarifies about the educational qualification of the selected respondents. It is interpreted that highest percentage is (61) which counts 172 respondents who have UG qualification followed by 108 respondents with PG which accounts for (39%).

**Table 3** Gadget used for online resources

| Gadget | Respondents | Percentage |
|---|---|---|
| Laptop | 41 | 15 |
| Mobile phone | 230 | 82 |
| Tap let | 7 | 02 |
| Computer | 2 | 01 |
| Total | 280 | 100 |

It is evidence from the table that most of the 230 respondents are used mobile phone (82%)

41 respondents are used Laptop (15%) used for tablet is 7 percentage is 2, remaining 1 percentage of respondents are used computer. Hence it can be concluded that the majority of the students are used mobile phone.

**Table 4**Satisfaction Level on the Usage of open E Resources

| Statement | S | % | HS | % | N | % | DS | % | HDS | % |
|---|---|---|---|---|---|---|---|---|---|---|
| E Journals &Magazines | 152 | 54 | 102 | 36 | 10 | 4 | 33 | 12 | 20 | 7 |
| E-Books | 130 | 46 | 86 | 31 | 18 | 6 | 30 | 11 | 16 | 6 |
| Databases | 118 | 42 | 99 | 35 | 4 | 2 | 17 | 6 | 5 | 2 |
| E Thesis & Dissertations | 80 | 29 | 69 | 25 | 90 | 32 | 21 | 7 | 20 | 7 |
| ENews Papers | 81 | 29 | 68 | 24 | 53 | 19 | 48 | 17 | 30 | 11 |
| E Research Reports&Projects | 25 | 9 | 19 | 7 | 113 | 40 | 65 | 23 | 58 | 21 |

S-Satisfaction, HS-Highly Satisfaction, N-Neutral, DS-Dissatisfaction, HDS–Highly Dissatisfaction

It is evidence from the Table 4Satisfaction level of usage of e resources. It is observed that highest 54 percentage (152) of respondents are satisfied used in E journals and Magazines next highest 36 percentage (102) of respondents are Highly Satisfied .4 percentage (10) of respondents are neutral. 12 percentages (33) of users are dissatisfied and 7percentages (20) of respondents are highly dissatisfied. 130 respondents are 46 percentage of respondents are satisfied felt about the opinion of E Books facility. Next highest 31 percentage (86) students are used e books highly

satisfied, 6 percentage (18) of respondents are neutral, dissatisfied of 11 percentage (30) and 7 percentage (20) of users Highly dissatisfied. students are felt about the Database 42 percentage (118) are satisfied, 35 percentage (99) respondents are highly satisfied 2 percentage (4) of students are neutral, 6 percentage (17) of respondents are dissatisfied, 2 percentage (5). students are highly dissatisfied, satisfied of e thesis & dissertation are 29 percentage (80) next 25 percentage (69) respondents are highly satisfied, 32 percentage (90 ) of users are neutral, 7 percentage (21) of users opinion is dissatisfied, highly dissatisfied. Satisfied for e news papers is highest 29 percentage (81), highly satisfied of 24 percentage (68) next 19 percentage (53) of students are neutral, 17 percentage (48) of students are dissatisfied remaining 11 percentage (30) of users highly dissatisfied. Students opinion for 9 percentage (25) of students are satisfied for research reports and project, 7 percentage (19) of respondents are highly satisfied, highest 40 percentage (113) of users are neutral, next 23 percentage (65) respondents are dissatisfied 21 percentage (58) students are highly dissatisfied. Hence it can be concluded that the majority of the students are satisfied for E journals and Magazines.

**Table 5** Are you Aware of the following Open Courses of educational online services

| Services | Aware | % | Not Aware | % |
|---|---|---|---|---|
| NPTEL | 250 | 89 | 30 | 11 |
| Mooc | 198 | 71 | 82 | 29 |
| Swayam | 213 | 76 | 67 | 24 |
| Swayam Prabha | 157 | 56 | 123 | 44 |
| E-Pg Pathshala | 88 | 31 | 192 | 69 |
| Course era | 102 | 36 | 178 | 64 |
| Khan academy | 156 | 56 | 124 | 44 |

The above table describes respondent's awareness of open Courses of educational online services such as NPTEL, Mooc, Swayam, Swayam Prabha, E pg Pathshala, Course era, Khan academy etc. There are 89 percentage (250) of respondents are aware NPTEL and 11 percentage (30) of the respondents are not aware, Next 71 Percentage (198) respondents are aware Mooc but not aware 29 percentage (82), next highest percentage is 76 (213) are aware Swayam 24 percentage (67) of the respondents are not aware, 56 percentage (157) students are aware swayam prabha, 44 percentage (123) respondents are not aware, 31 percentage (88) of the students aware e-pg pathshala 69 percentage (192) users are not aware. 36 percentage (102)

of students aware Coursera 64 percentage (178) students are not aware. 56 percentage (156) of the respondents are aware Khan academy 44 percentage (124) of the respondents are not aware. Hence it can be concluded that the majority of the students are aware NPTEL Course.

**Table 6** Frequently used for e resources

| Re-sources | frequently | % | Occasion-ally | % | Never | % | Rarely | % | Very Rarely | % |
|---|---|---|---|---|---|---|---|---|---|---|
| Delnet | 90 | 32 | 49 | 18 | 98 | 35 | 32 | 11 | 11 | 4 |
| Inflibnet-N List | 85 | 31 | 62 | 22 | 59 | 21 | 40 | 14 | 34 | 12 |
| Proquest | 56 | 20 | 49 | 18 | 63 | 22 | 83 | 30 | 29 | 10 |
| J gate | 69 | 25 | 29 | 10 | 79 | 28 | 48 | 17 | 55 | 20 |
| Ebsco | 55 | 20 | 32 | 11 | 74 | 26 | 50 | 18 | 69 | 25 |
| Web of Science | 22 | 8 | 15 | 5 | 210 | 75 | 14 | 5 | 19 | 7 |
| Scopus | 21 | 8 | 17 | 6 | 220 | 79 | 15 | 5 | 7 | 2 |
| NDLI | 94 | 34 | 71 | 25 | 60 | 21 | 25 | 9 | 30 | 11 |
| Oxford University Press | 46 | 16 | 30 | 11 | 128 | 46 | 44 | 16 | 32 | 11 |
| Springer | 22 | 8 | 16 | 6 | 161 | 57 | 32 | 11 | 49 | 18 |
| Elsevier | 18 | 6 | 15 | 5 | 176 | 63 | 43 | 15 | 28 | 10 |

It is evidence from the Table 6 frequently used for e resources. It is observed that 32 percentage (90) of the students are used frequently for delnet, 18 percentage (49) of the students are used occasionally, 35 percentage (98) of the students never used delent, 4 percentage (11) of the students are used very rarely. 31 percentage (85) of the users are used inflibnet-n list frequently, 22 percentage (62) respondents are used occasionally 21 percentage (59) of users of the students are never used, 14 percentage (40) of the students are used rarely 12 percentage (34) of the users are used very rarely. Next highest frequently used for NDLI 34 Percentage (94) respondents, 25 percentage (71) of users are used occasionally 21 percentage (60) of the students are never used remaining 11 percentage (30) are used very rarely. Other resources are used rarely. Hence it can be concluded that the majority of the students are frequently used NDLI.

**Table 7** How to you aware about Open e-resources Services and facilities

| Description | Respondents | Percentage |
|---|---|---|
| Library Orientation Programme | 116 | 41 |
| Library Staffs | 59 | 21 |
| Faculties | 57 | 20 |
| Institution Website | - | - |
| E-Mail Notifications | 8 | 3 |
| Self Awareness | 6 | 2 |
| Seminars/Conference | 10 | 4 |
| Peer Groups | 24 | 8 |
| Total | 280 | 100 |

The above table 7 described how they aware about open e-resources Services and facilities 41 percentage (116) of the students got awareness from Library Orientation Programme, 21 percentage 59 of the respondents got awareness from Library Staffs and Faculties , remaining few percentage of students are got from aware seminar/conference and peer groups. Hence it can be concluded that the majority of the students are get the awareness of Open e-resources Services and facilities from library Orientation Programme.

**Table 8** Purpose of Using E Resources

| Description | Respondents | Percentage |
|---|---|---|
| For Studying Coursework/Assignment | 110 | 39 |
| Research Work/Project | 56 | 20 |
| Update the Subject Knowledge | 79 | 28 |
| Writing Articles /Paper Presentation | 35 | 13 |
| Total | 280 | 100 |

The above table 8 reveals purpose of e resources 30 percentage (110) of students are studying for course work/assignment, 20 percentage (56) of the students purpose of used research work /project, 28 percentage (79) respondents are update the subject knowledge, remaining 13 percentage(35) of users are used writing articles/paper presentation. Hence it can be concluded that the majority of the students Purpose of Using E Resources for studying coursework/assignment.

**Table 9** Reasons for using e resources

| Description | Respondents | Percentage |
|---|---|---|
| Time Saving | 115 | 40 |
| Easy to Use | 86 | 31 |
| More Information | 35 | 13 |
| More Useful | 44 | 16 |
| Total | 280 | 100 |

It is evident from table 9 shows that 40 percentage (115) of the respondents prefer to use e resources felt that e-resources are Time saving, 31 percentage (86) of students followed by easy to use, 13 Percentage (35) of students get more information, 16 percentage (44) of students feel more useful. Hence it can be conclude that the majority of students to using e resources to time saving.

**Table 10** Problem faced for E-resources

| Description | Respondents | Percentage |
|---|---|---|
| Poor Network | 88 | 31 |
| More expensive | 54 | 19 |
| Language Barriers | 42 | 15 |
| More Information's | 23 | 9 |
| Handling | 44 | 16 |
| Lack of technical knowledge | 29 | 10 |
| Total | 280 | 100 |

The above table10 described the respondent's opinion about problems faced by them for using different aspects of e resources. There are 6 aspects included fir

analyzing the problems face by the users. It is evident from the analysis that 31 percentage(88) of the respondents opined poor network connection,10 percentage (54) of the users opinion is more expensive, 15percentage (42) of respondents opined language barriers, next 16 percentage (44) of respondents faced handling for the e-resources, remaining respondents 10 percentage (29) lack of technical knowledge and get more information's..Hence it can be concluded that the majority of the students facing poor network connection.

## Conclusion

The study aimed to find out the Use and Impact of open E-resources for College students in Pandemic period special reference to Pollachi. The study reveals that open e resources are most useful for the pandemic period. The students are used the open e resources frequently e-journals, e book and online database and preparing assignments studying course work and update their knowledge. Students are satisfied on open e resources ,The open e resources easy to use and easy to learn.

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# Awareness and Usage of Open Access Resources among Post Graduate Students: A Case Study of Lakireddy Balireddy College of Engineering

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**Abstract**

*This study examines postgraduate students' views on the awareness and access of open access resources of* Lakireddy Bali Reddy College of Engineering *(*LBRCE*), Mylavaram, Krishna district of Andhra Pradesh. A sample of 288 (100% of the total population) PG students has been drawn by the census sampling method. However, the investigator received responses from the 175 (60.76% of the sample) students only. The data analysed toward the awareness, frequency of usage, different types, advantages, satisfaction level of open access resources. It suggests further for an improvement in the access facilities with high Internet speed and provide to more number of computers in college central Library. The present study also attempts to encounter different problems faced by the students during accessing open access resources.*

**Keywords:** *Open Access Resources, Awareness, Usage, PG students*

## Introduction

Open Access (OA) to scholarly communication has given free access to scientific literature on the Web. The tremendous developments in information and communication technology and rising cost of publishing led to OA movement as an alternative model for accessing scholarly journals during early 2002. Since then several initiatives have been taken both nationally and internationally. There are three major players driving open access, viz. publishers, authors and libraries. To support OA movement authors started self-archiving on their personal websites or on institutional repositories. Commercial publishers also started publishing open access journals to which authors contributed. Because of all these, several open

access initiatives have emerged. In the present study, we analyse, awareness and usage of open access resources by post graduate students at Lakireddy Balireddy College of Engineering (LBRCE), Mylavaram of Andhra Pradesh.

## Lakireddy Balireddy College of Engineering

The Lakireddy Bali Reddy Charitable Trust sponsored the Lakireddy Bali Reddy College of Engineering which is built with a vision to serve the region for generations to come and to be among the premier institutions in the country in the sphere of technical education. In the short span of its existence the College earned a respectable position among its peers in the state for its spacious and serene environment, well designed and well ventilated buildings, fully equipped and state of the art laboratories, enthusiastic and well qualified faculty and student discipline and care.

The college has offered both undergraduate and post graduate programmes with intake of 1164 students. The library has 61553 volumes with 12159 titles of books and about 3400 back volumes of scientific and technical periodicals. The library also subscribes to nearly 115 National print journals and 45 magazines and more than 6800 e-journals & 31,35,000 e- books. A separate reference section is maintained with Handbooks and General knowledge books. Interlibrary loan facility is available through DELNET. Central Library supports departmental libraries in all departments. The library follows open access system encouraging the user to browse freely in the stock area.

## Open access resources

In general, the open access resources are open to all and are freely available. The users can download, use and share the required information for non-commercial purposes. Open access resources have no financial or legal barriers to access for members of our user community. The following factors must be in evidence:

1. The publication must be available online at no charge to readers or institutions. No subscription can be required for online access. \
2. Readers must be permitted to use the material for any lawful purpose, including downloading, copying, making derivative works, distributing, printing, searching, or linking to the full texts of works, crawling for indexing, or passing as data to software.

3. No licensor/licensee relationship shall exist between the publisher or provider of the online publication and the individual user or institution.
4. The publication must not be a free trial, complimentary access with subscription, part of an open access pilot project, or an "opt-in" title.
5. The publication must not be part of a mass digitization project (e.g., Google books, Open Content Alliance, etc.).

## Objectives of the Study

The objectives of the study are:

i. To find out awareness of open access resources;
ii. To examine the usage of open access resources;
iii. To identify frequently usage of various types of OAR;
iv. To study the satisfaction level of students; and
v. To study about the barriers of Open Access Resources.

## Methodology

The study was conducted by using a questionnaire method. At present there are 1738 (1020 UG students + 288 PG students + 250 Teaching + 180 Non teaching) users in this college. The investigator selected postgraduate students only. A sample of 288 (100% of the total population) PG students has been drawn by the census sampling method. However, the investigator received responses from the 175 (60.76% of the sample) students only. The questionnaires were distributed among the different branches of the students. The collected data was further supplemented by informal discussion with the students. The analysis and interpretation of the data is presented in the following paragraphs.

## Data Analysis

### Gender

The distribution of students' according to their gender is given in Table 1.

**Table 1:** Distribution of students according to their gender

| Gender | Number of students | Percentage |
|---|---|---|
| Male | 126 | 72.00 |
| Female | 49 | 28.00 |
| **Total** | **175** | **100.00** |

It is evident from Table 1 that out of 175 students, 72 percent are males and the remaining 28 percent are females.

**Learned to use open access resources**

The distribution of students learned to use open access resources is shown in Table 2.

**Table 2:** Distribution of students according to the learned to use open access resources

| Learned to use open access resources | Number of students | Percentage |
|---|---|---|
| Self study (reading books/journals, tutorials) | 75 | 42.86 |
| Family, friend or Colleague | 54 | 30.86 |
| Guidance from the library staff | 71 | 40.57 |
| Guidance from the departmental staff of computer Science | 49 | 28.00 |
| Formal courses | 31 | 17.71 |

(Multiple answers were permitted)

It is evident from Table 2 that 42.86 percent of the students are learning the necessary skills to use open access resources through self study (reading books/journals, tutorials etc), 40.57 percent learned through the guidance from library staff, 30.86 percent through family, friend or colleague, 28 percent guidance from the departmental staff of computer science, and 17.71 percent of the students are learning to use open access resources through formal courses.

**Places for accessibility of open access resources**

The distribution of students according to the places from which they access of electronic journals is shown in Table 3.

**Table 3:** Places for accessibility of open access resources

| Places | Number of students | Percentage |
|---|---|---|
| College Central Library | 105 | 60.00 |
| Computer Centre | 49 | 28.00 |
| Hostels | 51 | 12.00 |
| Anywhere in the campus | 77 | 44.00 |

(Multiple answers were permitted)

Table 3 shows that 60 percent of the respondents are accessing the open access resources from their college central library, 44 percent of them from anywhere in the college campus, 28 percent of them from departmental computer

centre, and 12 percent of them from hostels. It concluded that the majority of the users are accessing the open access resources from their college library.

**Frequency of using OPR**

The distribution of students according to the frequency of using the open access resources is shown in Table 4.

**Table 4:** Frequency of using OAR

| Frequency | Number students | Percentage |
|---|---|---|
| Daily | 71 | 40.57 |
| 2 or 3 times a week | 33 | 18.86 |
| Once in a week | 19 | 10.86 |
| Once in a month | 21 | 12.00 |
| Rarely | 31 | 17.71 |
| **TOTAL** | **175** | **100.00** |

It is evident from Table 4 that 40.57 percent of the postgraduate students are using the open access resources daily, 18.86 percent of them two or three times in a week, 17.71 percent are rarely, 12 percent of them once in a week and 10.86 percent of them are using once in a week.

**Usage of different open access resources**

The distribution of respondents according to the usage of different open access resources is shown in Table 5.

**Table 5:** Usage of different open access resources

| Types of E-Resources | Number of students | Percentage |
|---|---|---|
| E-Books | 51 | 29.14 |
| E-Journals | 84 | 48.00 |
| Online Databases | 58 | 33.14 |
| E-theses/dissertations | 43 | 24.57 |
| E-Newspapers | 41 | 23.43 |

(Multiple answers were permitted)

Table 5 shows that 48 percent of the post graduate students frequently used e-journals, followed by online databases (33.14%) e-books (29.14%), e-theses/dissertations (24.57%), and e-newspapers (23.43%).

## Purpose of using OAR

The distribution of students according to the purpose of using the open access resources is shown in Table 6.

It can be seen from Table 6 that 45.24 percent of the postgraduate students are using open access resources and services for their study. 35.43 percent of them are using it for their project work, 10.86 percent of them are using it to gain current information and 8.57 percent of the postgraduate students are the open access resources to update their knowledge.

**Table 6:** Purpose of using OAR

| Purposes | Number of students | Percentage |
|---|---|---|
| To gain current information | 19 | 10.86 |
| For research work/projects | 62 | 35.43 |
| For study | 79 | 45.24 |
| To update knowledge | 15 | 8.57 |
| **Total** | **175** | **100.00** |

## Advantages of using OAR

The distribution of postgraduate students according to the advantages of using open access resources is shown in Table 7.

**Table 7:** Advantages of using OAR

| Advantages | Number of students | Percentage |
|---|---|---|
| Articles can be accessed freely | 111 | 63.43 |
| Ease of access | 29 | 16.58 |
| More informative | 15 | 8.57 |
| Open Access provides larger potential evidence | 11 | 6.28 |
| Time saving | 9 | 5.14 |
| **TOTAL** | **175** | **100.00** |

Table 7 shows the responses of postgraduate students about the advantages for using the open access resources. It is revealed that it provides free online access (63.43%) and easy accessibility (16.58%) are the major advantages of open access resources.

**Level of satisfaction with OAR**

The distribution of postgraduate students according to the level of satisfaction with open access resources is shown in Table 8.

**Table 8:** Level of satisfaction with open access resources

| Level of satisfaction | Number of students | Percentage |
|---|---|---|
| Satisfied | 98 | 56.00 |
| Neither satisfied nor dissatisfied | 45 | 25.71 |
| Dissatisfied | 32 | 18.29 |
| **TOTAL** | **175** | **100.00** |

It is evident from Table 8 that more than half of the postgraduate students (56%) are satisfied with the open access resources, 25.71 percent of them are neither satisfied nor dissatisfied, and 18.29 percent of them dissatisfied.

**Problems encountered while accessing OAR**

The distribution of respondents according to the Problems encountered while accessing open access resources is shown in Table 9.

**Table 9:** Problems encountered while accessing OAR

| Problems | Number of students | Percentage |
|---|---|---|
| Lack of Internet access speed | 73 | 41.71 |
| Insufficient number of computers | 54 | 30.86 |
| Overload of information on the Internet | 43 | 24.57 |
| Lack of computer Skills | 21 | 12.00 |
| Difficult in finding relevant information | 38 | 21.71 |

(Multiple answers were permitted)

Table 9 shows the responses of postgraduate students about their problems for accessing the open access resources. It is revealed that the major problems are lack of internet access speed (41.71%), insufficient number of commuters (30.86%), and difficulty in finding relevant information from the internet.

## Conclusions and Suggestions

i. Out of 175 students, 72 percent are males and the remaining 28 percent are females.

ii. Most of the postgraduate students (42.86%) are learning the necessary skills to use open access resources through self study (reading books/journals, tutorials etc) compared to other sources.

iii. Majority of the postgraduate students (60%) are accessing the open access resources from their college central library compared to other places.

iv. Most of the postgraduate students (40.57%) are using the open access resources daily, 18.86 percent of them two or three times in a week, 17.71 percent are rarely, 12 percent of them once in a week and 10.86 percent of them are using once in a week.

v. Most of the postgraduate students (48%) frequently used e-journals, followed by online databases (33.14%) e-books (29.14%), e-theses/dissertations (24.57%), and e-newspapers (23.43%).

vi. Most of the postgraduate students (45.24%) are using open access resources and services for their study.

vii. Majority of the postgraduate students are replied free online access (63.43%) and easy accessibility (16.58%) are the major advantages of open access resources.

viii. More than half of the postgraduate students (56%) are satisfied with the open access resources, 25.71 percent of them are neither satisfied nor dissatisfied, and 18.29 percent of them dissatisfied. It is suggest that the user friendly training programmes regarding on how to use open access resources effectively should be organized at regular intervals.

ix. The study revealed that the major problems are lack of internet access speed (41.71%), insufficient number of commuters (30.86%), and difficulty in finding relevant information from the internet. Hence, it suggests that to increase the bandwidth of speed and more number of computers is provided.

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# Awareness and Use of Electronic Theses and Dissertations among the Research Scholars of Sri Venkateswara University, Tirupati: A Study

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## Abstract

*Discuss the awareness and use of electronic theses and dissertation (ETDs) among the research scholars of Sri Venkateswara University, Tirupati, AP. In this study survey method of research has been used to collect data from the research scholars of Arts and Science. 135 questionnaires were prepared and distributed to users; Out of 135 questionnaires 100 usable questionnaires were received. High percentage (90%) of the respondents visit library to refer theses / dissertations and (84%), to read newspapers / magazines, most of the respondents (86%) are aware on Shodhganga (ETDs) and (83%) of research scholars felt that it is easy to search information on Shodhganga.*

***Keywords:*** *ETDs, Research scholars, Shodhganga, Sri Venkateswara University, Tirupathi.*

## Introduction

University libraries are serving the information need of the students, research scholars and faculty members. There are no research and extension activities without proper library facilities. University library holds different kinds of reading materials needed for academic and research activities. Every year hundred of research scholars are admitting into university into various disciples. Generally, the research scholars select their research topics with consultation of their research supervisor and consulting the thesis available in their library. At present, there are many repositories of electronic theses and dissertations (ETDs) have been established throughout the world imparting that to avoid duplication of research work. India also establishing ETDs like Shodhganga under UGC-INFONET. In these circumstances the study has been chosen to examine and identify the research scholars' opinion, problems and their experience with the ETDs

Electronic theses and dissertations (ETDs) are electronic version of the thesis or dissertation which is extremely valuable resources for research and development in academic institutions. Earlier research papers and reports were mainly available in print form, but now with technological advancements these were available in digital form and can be accessed anywhere across the globe.

Theses and dissertations are vital for research work and these are do not find its way into various publication channels. ETDs have many advantages and are gaining importance over print formats. Thesis submitted for the PhD degree are hard to get to access, because these were collected (by the library of the) university that granted the Ph.D degree. ETDs can be easily located, accessible. There are many ETDs are available some of them are Shodhganga, ShodhBhagirath, Mahatma Gandhi University-Online Thesis, ETD @IISc, Etheses, Dyuthi, Library of the Indian Institute of Science -JRD Tata Memorial Library, North-Eastern Hill University Digital Library,[1]Vidyanidhi, ETD-JNUandEprint@IITDelhietc.

## Shodhganga: a reservoir of Indian Theses

"Shodhganga" is the digital repository of Indian Electronic Theses and Dissertations set-up by the INFLIBNET Centre. The word "Shodh" is originated from Sanskrit which means for research and discovery. The "Ganga" is the holiest, and longest of all the rivers in the India. Shodhganga stands for the reservoir of Indian intellectual output stored in a repository hosted and maintained by the INFLIBNET Centre.

The Shodhganga@INFLIBNET is set-up using open source digital repository software called DSpace developed by MIT (Massachusetts Institute of Technology) with collaboration Hewlett- Packard (HP). Shodhganga provides a platform for research scholars to deposit their Ph.D. theses and make it available to the entire scholarly community in open access.[2]

## Objectives

- To know the purpose of library visit of research scholars.
- To know the awareness on Shodhganga and other ETDs.
- To know the purpose of using Shodhganga and ETDs
- To examine the search strategies in using ETDs by research scholars and
- To identify the problems in using ETDs.

## 1. Methodology

In this study, survey method was used for collection of data. A questionnaire tool was prepared containing question on different aspects on awareness and usage of Shodhganga and other ETDs. One hundred and thirty five questionnaires were prepared and distributed to research scholars of Arts and Science in Sri Venkateswara University, Tirupati using convenient sampling

method. Out of 135 questionnaires 100 usable questionnaires were received. After collecting the data, the data was analyzed and interpreted in the form of tables as well as presented in graphs.

**Analysis of data**

**Discipline**

A question has been asked to the respondents to know their discipline. The replies given by them are shown in Table-1.

**Table 1:** Discipline wise respondents

| Discipline | Response by Type | |
|---|---|---|
| | **Number** | **Percentage** |
| Arts | 60 | 60% |
| Science | 40 | 40% |
| **Total** | **100** | **100%** |

It is observed from the table-1 that majority of the respondents (60%) are from arts discipline and reaming of them form (40%) are from science discipline.

**Library visit**

A question has been asked to the respondents to know their library visit. The replies given by them are shown in Table-2.

**Table 2:** Library Visit

| Library visit | Response | |
|---|---|---|
| | **Number** | **Percentage** |
| Daily | 38 | 38% |
| Alternatively | 10 | 10% |
| Weekly | 18 | 18% |
| On requirement | 34 | 34% |
| **Total** | **100** | **100%** |

It is observed from the table-.2 that majority of the respondents (38 %) visit the library daily followed by on requirement (34%), weekly (18%) and reaming of them (10%) visit Alternative days.

**Purpose of visiting the library**

A question has been asked to the respondents to know their purpose of library visit. The replies given by them are shown in Table-.3

**Table 3:** Purpose of visiting library

| Purpose | Total respondents | Response by Type | |
|---|---|---|---|
| | | Number | Percentage |
| To read newspapers / magazines | 100 | 84 | 84% |
| To collect Subject Information | 100 | 54 | 54% |
| To consult books/periodicals | 100 | 69 | 69% |
| To get general information | 100 | 44 | 44% |
| To prepare competitive examinations | 100 | 84 | 84% |
| To consult reference sources | 100 | 60 | 60% |
| To refer Theses / Dissertations | 100 | 90 | 90% |
| To search online databases | 100 | 83 | 83% |
| To improve knowledge in the area of specialization | 100 | 52 | 52% |

(Respondents are permitted to tick more than one answer)

It is clear from the Table-.3that the majority of the respondents (90%) visit library to consult theses/dissertations followed by for preparing competitive exams and to read newspapers/magazines (84%),to search online databases (83%),to consult books/periodicals (69%), to consult reference sources (60%), to collect Subject Information (54%), to improve knowledge in the area of specialization (52%) and remaining of them (44%) to general information.

**Selection of Ph.D topics**

A question has been posed to the respondents to know how they selected their research topic. The replies given by them are shown in Table-.4.

**Table 4:** Selection of Ph.D Topic

| Selection of Ph.D topics | Total respondents | Response by Type | |
|---|---|---|---|
| | | Number | Percentage |
| Research supervisor | 100 | 92 | 92% |

| | | | |
|---|---|---|---|
| Own initiation | 100 | 24 | 24% |
| Going through old Library catalogues | 100 | 44 | 44% |
| Search on shodhganga (ETDs)/Internet | 100 | 57 | 57% |

(Respondents are permitted to tick more than one answer)

It is observed from the table-.4 that majority of the respondents (92%) replied that the research topic was finalized on the advice of the research supervisor followed by Search on shodhganga (ETDs)/Internet (57%), Going through old Library catalogues (44%) and reaming of them (24%) by their own initiation

**Awareness on Shodhganga**

A question has been put to the respondents to know their awareness on Shodhganga (ETDs). The replies given by them are shown in Table-5

**Table 5:** Awareness on Shodhganga

| **Reply** | **Response by Type** | |
|---|---|---|
| | **Number** | **Percentage** |
| Yes | 86 | 86% |
| No | 14 | 14% |
| **Total** | **100** | **100%** |

Table-5 confirms that majority of the respondents (86%) are aware on Shodhganga (ETDs) and remaining of them (14%) are not aware.

**Visit of Shodhganga website**

A question has been posed to the respondents to know their visit to the Shodhganga website visit. The replies given by them are shown in Table-6

**Table6:** Visit of Shodhganga website

| **Reply** | **Response by Type** | |
|---|---|---|
| | **Number** | **Percentage** |
| Yes | 89 | 89% |
| No | 11 | 11% |

| | | |
|---|---|---|
| **Total** | **100** | **100%** |

Table-6reveals that majority of the respondents (89%) are visit Shodhganga (ETDs) for research purpose and remaining of them (11%) are not.

**Sources to know about Shodhganga**

A question has been posed to the respondents how they came to know the Shodhganga (ETDs). The replies given by them are shown in Table-7

**Table7:** Sources to know about Shodhganga

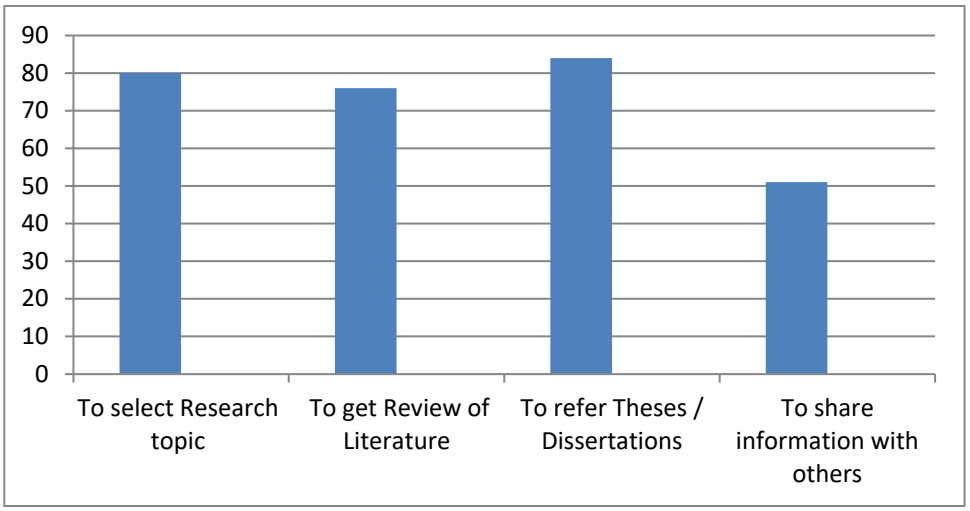
| **Sources to know about Shodhganga** | **Total respondents** | **Response by Type** | |
|---|---|---|---|
| | | **Number** | **Percentage** |
| Through research supervisor | 100 | 72 | 72% |
| Through fellow researchers | 100 | 88 | 88% |
| Self | 100 | 16 | 16% |

(Respondents are permitted to tick more than one answer)

It is observed from the table-7 that majority of the respondents(88%) replied that they came to know about Shodhganga through fellow researchers followed by Through research supervisor (72%), and reaming of them (16%) came to know about Shodhganga by themselves.

**Purpose of visiting Shodhganga**

A question has been posed to the respondents to know their purpose of visiting the shodhganga website. The replies given by them are shown in figure-1.




(Respondents are permitted to tick more than one answer)

**Figure1:** Purpose of visiting Shodhganga

The replies given by them are shown in figure-1. It is clear from the figure-1 that the majority of the respondents (80%) visit Shodhganga to refer Theses / Dissertations followed by to select Research topic (80%), to get Review of Literature (76%), and remaining of them (51%) to share information with others.

**Availability of related information**

A question has been posed to the respondents to know their availability of related information. The replies given by them are presented in Table-8.

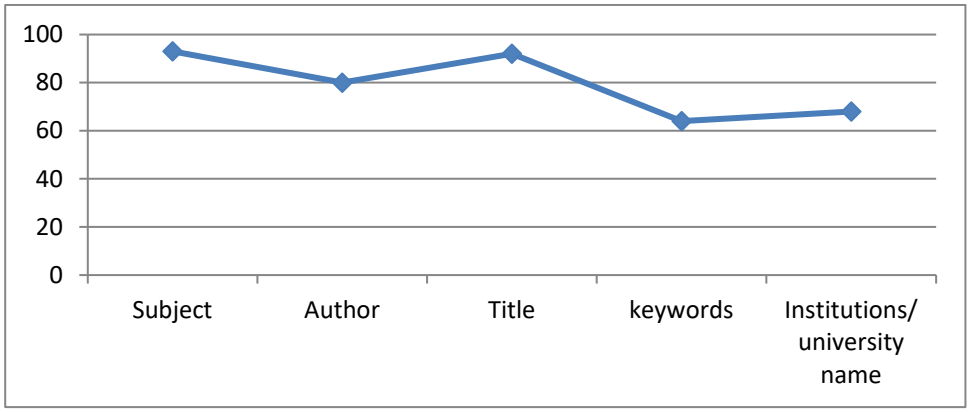
**Table 8:** Availability of related information

| Reply | Response by Type | |
|---|---|---|
| | **Number** | **Percentage** |
| Yes | 100 | 100% |
| No | 00 | 0% |
| **Total** | **100** | **100%** |

It is observed from the table-8 that all the respondents' replied that they got related information on shodhganga.

## Search strategy

A question has been asked to the respondents to know their search strategy to get relevant information through shodhganga. The replies given by them are shown in figure-2.




(Respondents are permitted to tick more than one answer)

**Figure2:** Search strategy

It is clear from the figure-2 that the majority of the respondents (93%) get required information by using Subject as search strategy followed by Title (92%), Author (80%), Institutions/ university name (68%), and remaining of them (64%) use keywords to get required information on Shodhganga.

## Easy to search

A question has been posed to the respondents to know whether it is easy to search information on Shodhganga or not. The replies given by them are shown in Table-9.

**Table 9:** Easy to search

| Reply | Response by Type | |
|---|---|---|
| | Number | Percentage |
| Yes | 83 | 83% |
| No | 17 | 17% |
| **Total** | **100** | **100%** |

Table-9 confirms that most of the respondents (83%) are opined that searching is easy in Sodhganga by using search strategies.

## Awareness on Other ETDs

A question has been asked to the respondents to know whether they aware ETDs similar to Shodhganga or not. The replies given by them are shown in Table-5.10.

**Table10:** Awareness on Other ETDs

| ETDs | Total respondents | Response by Type | |
|---|---|---|---|
| | | Number | Percentage |
| Vidyanidhi | 100 | 44 | 44% |
| Shodh Bhagirathi | 100 | 36 | 36% |
| ETD-JNU | 100 | 8 | 8% |
| Eprint@IIT Delhi | 100 | 4 | 4% |
| KrishiPrabha | 100 | 16 | 16% |
| ETD-IISc | 100 | 25 | 25% |
| Dyuthi,-Digital Repository of Cochin University of Science and Technology | 100 | 16 | 16% |
| Etheses – A Saurashtra University Library Service | 100 | 16 | 16% |
| MGU Online Theses Library | 100 | 4 | 4% |

(Respondents are permitted to tick more than one answer)

It is clear from the Table-10 that the majority of the respondents (44%) were aware about Vidyanidhi followed by Shodh Bhagirathi (36%), ETD-IISc (25%), Dyuthi, Etheses, Krishi Prabha (16%), ETD-JNU (8%) and remaining of them (4%) MGU Online Theses Library and Eprint @ IIT Delhi.

## Training program

A question has been asked to the respondents to know whether they have attended the training programmes on shodhganga. The replies given by them are shown in Table-11.

**Table11:** Awareness program

| Reply | Response by Type | |
|---|---|---|
| | Number | Percentage |
| Yes | 56 | 56% |

| | | |
|---|---|---|
| No | 44 | 44% |
| **Total** | **100** | **100%** |

It is confirms from the table-11that majority of the respondents (56%) replied that they have attended trainning program on shodhganga and remaining of them (44%) replied negatively.

**Awareness on plagiarism checker softwares**

A question has been asked to the respondents to know whether they have aware of plagiarism checker software's. The replies given by them are shown in Table-12

**Table12:** Awareness on plagiarism checker software's

| Plagiarism checker softwares | Total respondents | Response by Type | |
|---|---|---|---|
| | | Number | Percentage |
| Urukund | 100 | 84 | 84% |
| Turnitin | 100 | 36 | 36% |
| viper | 100 | 28 | 28% |
| iThenticate | 100 | 12 | 12% |
| Plagiarism Checker X | 100 | 24 | 24% |

(Respondents are permitted to tick more than one answer)

It is clear from the Table-12 that the majority of the respondents (84%) were aware about Urukund followed by Turnitin (36%), Viper (28%), Plagiarism Checker X (24%), and remaining of them (12%) were aware about I Thenticate plagiarism checker software.

**Problems faced in using Shodhganga and other ETDs**

A question has been asked to the respondents to know whether they were facing any problems while using shodhganga and other ETDs. The replies given by them are shown in Table-13

**Table13:** Problems faced in using Shodhganga and other ETDs

| Problems | Total respondents | Response by Type | |
|---|---|---|---|
| | | Number | Percentage |
| Lack of browsing | 100 | 94 | 94% |

| | | | |
|---|---|---|---|
| skills | | | |
| Poor knowledge of search strategy | 100 | 79 | 79% |
| Low internet speed | 100 | 56 | 56% |
| Lack sufficient computers | 100 | 82 | 82% |
| Lack of training on ETDs | 100 | 91 | 91% |

(Respondents are permitted to tick more than one answer)

The Replies given by them are shown in Table-13. It is clear from the Table-15 that the majority of the respondents (94%) were faced problem due of lack of browsing skill followed by lack of training on ETDs (91%), lack sufficient computers(82%), poor knowledge of search strategy (79%), and remaining of them (56%) were faced problem due to low internet speed.

**Major findings of the study**

- Majority of the respondents (38.%) are visit library daily
- High percentage (90%) of the respondents(research scholars) visit library to refer Theses / Dissertations and (84%) to read newspapers / magazines
- Majority of the respondents (92%) have replied that the selection of topic was on the advice of the research supervisor.
- Majority of the respondents (86%) are aware on Shodhganga (ETDs)
- Majority of the respondents (72%) replied that they came to know about Shodhganga through fellow researchers.
- Majority of the respondents (89%) replied that they have visited the Shodhganga website to get related information.
- Majority of the respondents (84%) replied that they visit shodhganga to refer theses and to get literature on the topic.
- Cent percentage of the respondents (100%) replied that they have found related information for research purpose.
- Majority of the respondents (92%) have replied that they use Subject and title as search strategy to get information on Shodhganga.
- Majority of the respondents (83%) felt that it is easy to search information on Shodhganga.
- Majority of the respondents (84%) are aware on Urukundu plagiarism checker software.

## Suggestions

- Majority of research scholars (90%) are using library for consulting theses and dissertations and (84%) reading newspapers, it is necessary that the library officials should take proper steps to improve the availability of various resources in library and conduct awareness programs on use of other resources that are useful to research scholars.
- Majority of the respondents (92%) replied that the research topic was finalized on the advice of the research supervisor. The research scholars should be encouraged to select the research topic of their interest and research supervisor should guide them in topic selection.
- Lack of browsing skills, lack of sufficient computers and lack of training on using the ETDs are the main problems faced by the research scholars hence library should conduct training programmes on information searching skills to research scholars.
- Library should conduct awareness and training programs on plagiarism checker softwares.

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# Usages Of E-Pg Pathshala Among Postgraduate Students Of Iihs(Institute Of Integrated And Honours Studies) Kurukshetra University, Kurukshetra, Haryana: A Study

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## Abstract

*This study examines postgraduate students' of IIHS (Institute of Integrated and Honours Studies) awareness and use of e-PGPathshalaactivities.The survey method was used to collect primary data from the respondents. In addition, a Structured questionnaire with personal interaction was also conducted among all respondents. Different factors, such as frequency (% age), analysed the study.The study shows that e-PG Pathshalahas effectively fulfilled the students' goals of IIHS Kurukshetra University, complementing their traditional learning. The study found that teachers and colleagues are playing a very significant role in educating students regarding e-PGPathshala.*

**Keywords:***e-PGPathshala, Postgraduate Students, IIHS, Awareness, OER(Open Educational Resources), Kurukshetra University*

## Introduction

Open Educational Resources (OER) play a significant role in e-learning. The term Open Educational Resources are an international initiative first introduced by UNESCO in 2002. The main aim of OER is to help the users in e-learning (Online Learning) to access their study material, course note, learning videos. OER can be classified into Open Course Ware (OCW) and Massive Open Online Courses (MOOCs). OCW has included teaching material, videos and content from seminars, lecture notes, and supplementary materials links. MOOCs have included a

collection of teaching material and allow students to interact through discussion forums. It is also providing students with a complete and well-organised package.

The Government of India has taken many steps to promote educational resources such as e-Gyankosh, Sakshat, NEPTEL, and e-PGPathshala. And this paper focuses on e-PGPathshala among them. E-PGPathshala is an initiative of the MHRD under its National Mission on Education through ICT (NME-ICT) being executed by the UGC. It is one of the best platforms for students of postgraduate, research scholars and teachers. It covers 23,000 modules (e-Text and Videos) in 70 Postgraduate streams of social sciences, arts, fine arts and humanities, natural and mathematical sciences.

In a nutshell, we can say that online learning is easy to understand because it is delivered using a variety of Information and Communication Technology (ICT) applications for educational purposes. It means that any educational resource or electronic content, be it lectures, audio/video, or notes with various types of textbooks is delivered to students through technological innovation in the digital form of computerised electronic devices. Only ICT has made this dream of distance education a reality.

In cloud computing technology, online schooling learning (OEL) has drastically converted coaching and studies. Therefore, the predominant position of OEL surfaced at some stages in the duration of COVID-19, which brought some modes of online schooling education.

## Research Methodology

The present study data were collected in November 2021from postgraduate students' of IIHS (Institute of Integrated and Honours Studies). A well-structured questionnaire was randomly distributed to postgraduate students' total questionnaires, 52 were distributed randomly through personal interaction, and 42 filled questionnaires were obtained. The analysed data is presented in tabular and graphical form.

## Scope of the Study

The study is undertaken to identify awareness and use of e-PGPathshala among Postgraduate students of M.Sc. Biotechnology, M.Sc. Engineering Physics, M.Sc. Economics of **IIHS (Institute of Integrated and Honours Studies)** Kurukshetra University, Kurukshetra, Haryana.

## Objectives of the Study

The following are the main objective of the study:

- to identify the awareness about e-PGPathshala among the Postgraduate students of the Science stream, Kurukshetra University, Kurukshetra,

- to know the use of e-PGPathshala among Postgraduate students,
- to find out the extent of the level of satisfaction towards e-PGPathshala,
- to find out the benefits of e-PGPathshala among Postgraduate students and
- to measure the problems in accessing e-PGPathshala by Postgraduate students.

**Data Interpretation**

**Table 1:** Gender wise distribution

| S.No. | Gender | N | % |
|---|---|---|---|
| 1. | Male | 18 | 42.85 |
| 2. | Female | 24 | 57.14 |
| 3. | Total | 42 | 100 |

Table 1 shows the gender-wise distribution of respondents and found that 42.25 % of respondents were male and 57.14% of respondents were female.

**Table 2:** Awareness of Respondents

| S.No. | Awareness | N | % |
|---|---|---|---|
| 1. | Yes | 20 | 47.61 |
| 2. | No | 22 | 52.38 |
| 3. | Total | 42 | 100 |

Table 2 showsrespondents' awareness and that 47.61% of respondents were aware of e-PGPathshala, and 52.38% of respondents were not aware of it.

**Table 3:**Source of Information regarding e-PGPathshala

| S.No. | Source of Information regarding e-PGPathshala | N | % |
|---|---|---|---|
| 1. | Through teacher | 8 | 40 |
| 2. | Through Internet | 10 | 50 |
| 3. | Through library staff | 0 | 0 |

Table 3 depicts that 40% of respondents were aware through teachers, and 50% were aware through the Internet.

**Table 4:** Prefer material access through e-PGPathshala

| S.No. | Prefer material access through e-PGPathshala | N | % |
|---|---|---|---|
| 1. | E-text | 12 | 60 |
| 2. | Video Lecture | 4 | 20 |
| 3. | Quiz | 4 | 20 |

The table 4 shows that 60% of respondents used e-PGPathshala through E-Text, 20% respondents used e-PG Pathshala through video lecture and 20% of respondents used e-PG Pathshala through Quiz.

**Table 5:** e-PGPathshala fulfil the purpose of classroom teaching

| S.No. | e-PGPathshala fulfil classroom teaching | N | % |
|---|---|---|---|
| 1. | Yes | 9 | 45 |
| 2. | No | 6 | 30 |
| 3. | Not Sure | 5 | 25 |

Table 5 shows that 45% of respondents said that e-PGPathshala fulfils the purpose of classroom teaching, and 30 % of respondents said that e-PGPathshala does not fulfil the purpose of classroom teaching, whereas 25% of respondents do not feel sure about it.

**Table 6:**Quality of e-content of e-PGPathshala

| S.No. | Quality of e-content | N | % |
|---|---|---|---|
| 1. | Very good | 16 | 80 |
| 2. | Good | 4 | 20 |
| 3. | Poor | 0 | 0 |
| 4. | Very Poor | 0 | 0 |

Table 6 shows that 16 (80%) respondents said that the materials on e- PGpathshalaare very good, whereas 4 (20%) students said material is good on e-PGPathshala.

**Table 7:**Purpose of using e-PGPathshala

| S.No. | Purpose of using e-PGPathshala | N | % |
|---|---|---|---|
| 1. | Class Assignment | 18 | 90 |
| 2. | Preparing exam notes | 15 | 75 |
| 3. | Keeping up to date | 3 | 15 |
| 4. | E-learning for speed and saving money | 0 | 0 |
| 5. | Competitive examination | 5 | 25 |
| 6. | For information search | 1 | 5 |
| 7. | Enhance knowledge | 6 | 30 |

Table 7 shows that the majority of the respondents, i.e. 18 (90%), use e-PGPathshala for the contents related to their syllabus. 15(75%) of respondents use e-PGPathshala to get the material for their classroom teaching, whereas 13(35.13%) respondents retrieve exam notes from the repository of e-PGPathshala. 5 (13.51%) respondents access material for competitive examination. On the other hand, few respondents, i.e. 3(8.10%), use e-PGPathshala for interview queries.

**Table 8:**Satisfaction level of respondents regarding e-PGpathshala

| S.No. | Satisfaction Regarding E-PGPathshalaStudy Material | N | % |
|---|---|---|---|
| 1. | Fully satisfied | 02 | 10 |
| 2. | Satisfied | 16 | 80 |
| 3. | Not satisfied | 02 | 10 |

The table 8 shows that 16 (80%) respondents were satisfied with e-PGPathshala, 2(10%) respondents were fully satisfied with e-PGPathshala, whereas a very few respondents were not satisfied.

**Table 9:** Frequency of using e-PGPathshala

| S.No. | Frequency | N | % |
|---|---|---|---|
| 1. | Daily | 00 | 00 |
| 2. | Weekly | 04 | 20 |
| 3. | Monthly | 15 | 75 |
| 4. | Sometimes | 09 | 45 |
| 5. | Never | 00 | 00 |

Table 9 depicts the frequency of using e-PGPathshala by the respondents and found that 15(75%) respondents use e-PGPathshalaevery month, followed by 9(45%) respondents who use it monthly basis and only 4(20%) respondents use it weekly.

**Table 10:**SearchTerm used by the Respondents

| S.No. | Search Term Used | N | % |
|---|---|---|---|
| 1. | Subject | 6 | 30 |
| 2. | Authors | 5 | 25 |
| 3. | Keywords | 7 | 35 |
| 4. | Title | 8 | 40 |

Table 10 shows the search term used by the Post Graduate students while accessing study materials in e-PGPathshala study materials. Data shows that 8(40%) respondents search subject-wise study materials in e-PGPathshala, whereas 7(35%) respondents prefer to use e-PGPathshala by keywords. 6(30%) respondents access information in e-PGPathshala by using the name of the author

**Table 11:** Advantage of using e-PGPathshala

| S.No. | Advantage of e-PGPathshala | N | % |
|---|---|---|---|
| 1. | Easy to use | 0 | 0 |
| 2. | Easy to search | 10 | 50 |
| 3. | Multi user access | 0 | 0 |
| 4. | 24*7 availability | 13 | 65 |
| 5. | Free of cost | 15 | 75 |
| 6. | Quality of content | 9 | 45 |

The table 11 shows the advantages of using e-PGPathshala. It reveals that 15(75%) respondents say thattheavailability of free of cost material of e-PGPathshala is the most effective factor.And it is preferred to use e-PGPathshalaon print sources. 13(65%) respondents prefer to use e-PGPathshala because it is 24*7 availability, whereas 10(50%) respondents prefer to use it as it provides easy search with the material.

**Table 12:**ProblemsFaced by Respondents while Using e-PGPathshala

| S.No. | Problem Faced while using e-PGPathshala | N | % |
|---|---|---|---|
| 1. | Speed of Internet | 18 | 90 |
| 2. | Inadequate information regarding study material | 00 | 00 |
| 3. | Lack of search techniques | 04 | 20 |
| 4. | Lack of desirable materials | 06 | 30 |

The table 12 depicts the problem faced by the respondents though accessing contents in e-PGPathshala and found that a good majority of students, i.e. 18(90%) face the problem of internet speed, 6(30%) Lack of desired material, followed by lack of search technique by 4(20%) respondents.

## Conclusion

e- PGPathshala is the most effective gateway of scholarly literature in India for postgraduate students, and it provides very useful material to its users. The study found that most respondents, i.e. 47.61 %, are aware of e-PGPathshala. The study found that teachers and the Internet play a responsible role in educating students regarding the use of e-PGPathshala. Further, this study shows that e-PGPathshala fulfils the purpose of classroom teaching. The study recommended that

UGC/universities organise training programs on the awareness of e-PG Pathshala so that postgraduate students can effectively use it.

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# Automation and Usage of Library Repositories: A case study of Faculty of Science and Technology (FST-ICFAI Tech) Hyderabad

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## Abstract:

*Libraries are becoming knowledge resource centres or knowledge focus. With the changing needs of the Users, Libraries have to use the latest information technologies to satisfy their user's information needs. Information Technology is moving so fast that it is difficult to cope with changes and challenges. With the introduction of new technologies, information activities quickly abandoned traditional methods to meet the tremendous information explosion and high demand for information; libraries are now taking advantage of digital technology available at a cheaper rate. This study outlines efforts to use information technology tools to automate the FST- (ICFAI- Tech) Library in Hyderabad. It goes over the automation process with the Lib Suite library software.*

**Keywords:** *Library Automation, Lib Suite Software, Digital Library*.

## Introduction:

In any educational institution, the library is essential from the start; the concept of the library was "a storehouse for books", where books were kept in closed access. Over time, most Libraries introduced Open Access Systems, where users could easily find the books. 21st-century libraries started to use Computers and IT tools to automate their libraries with different functioning. To "provide the right information to the right reader at the right time" is possible only if libraries use Information Technology as a tool. The librarian must as a knowledge manager or information manager with the changing needs of the users; Libraries have to follow the latest technologies to satisfy their user needs. Effective use of technology enables users to retrieve information quickly and efficiently.

The Faculty of Science and Technology (ICFAI-TECH), Hyderabad, offers Four years of PhD full time/Part-time/ PG program (M.Tech), UG program (B.Tech) and Five years Integrated Dual Degree B.Sc. (First Degree) - B.Tech. (Second Degree) for delivering high-quality science and technology education. To

provide quality education and research, an Academic institution should have an excellent and well-equipped modern library.

**Objectives of the study:**

1. Develop and update library books and other resource databases.
2. Use the lib suite software to implement the Automation systems
3. Perform the charge and discharge functions of the cycle more efficiently.
4. Provide various search options to understand the Availability of books in the library.
5. Generate a list of books payable by specific members and late fees

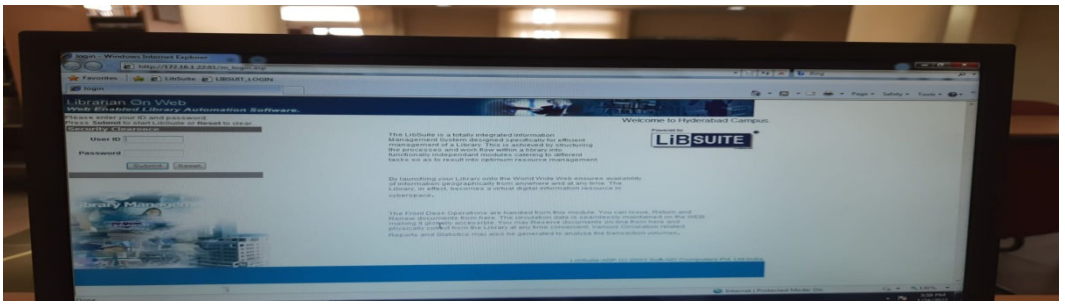
**FST Library:**

Initially, the FST library had many books distributed manually, like the Browne Issue system. It was decided to use the Lib Suite software, including cataloguing books, distribution, query, and serial control.

Before automation, the whole process was completed in a manual process in the library. Everything had to be achieved by maintaining different registers, book cards, book covers, etc., which resulted in a longer process. Collecting data for various reports is a time-consuming and challenging process in the manual process. It's tough to uncover all components of the subscription problem from the newspaper's perspective. As user needs evolve, libraries also need to meet technical requirements and implement automation better to serve users in a shorter time. The library finally selected Lib Suite software from Soft-Aid Computers at Pune.

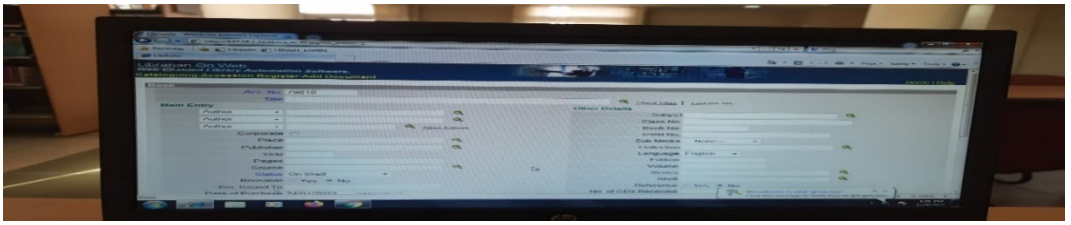
**Lib Suite Software**:

FST (IFHE) Hyderabad Library installed Lib Suite library automation software; Library staff have been trained in using the software. Lib Suite for Windows is an integrated software package to manage all aspects of library management. The software includes the following modules, which are self-explanatory and easy to use



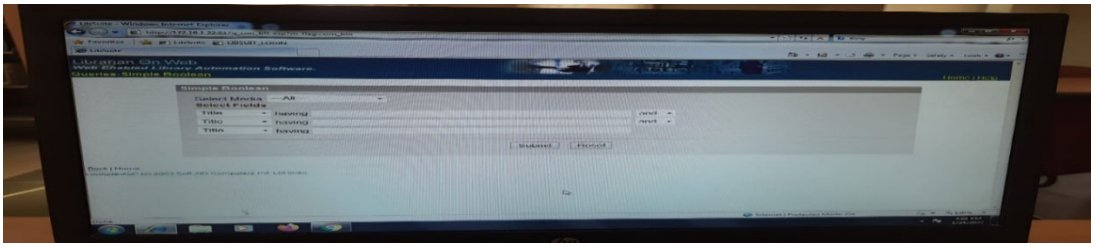

Libsuite Home page

**Acquisition**: approval, invoicing and budgetary control, research of purchases.

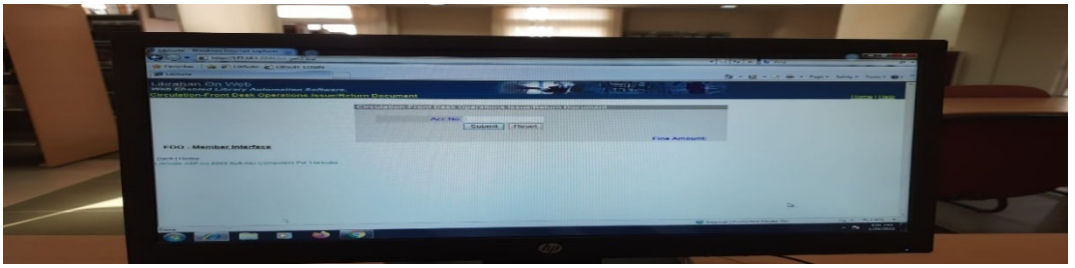


**Cataloguing**: file processing or Document processing

**Query**: Quick search, Boolean search, standard query, display the new arrival list, CAS service and show the latest issue of periodicals



**Circulation:** issue/return of documents, renewal, reservation tools, circulation reports and circulation statistics.



**Serial control**: periodical subscription, Kardex, pending Subscription, report creation, binding treatment, Bindery processing free subscription or complimentary Subscription

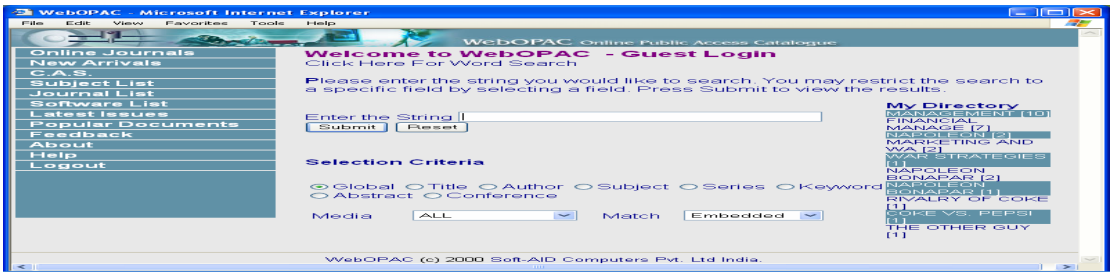
**Housekeeping**: Stock Verification, enter the stock, allows transparent log file, Generate KWIC A screenshot of Lib suite Software Stock verification, stock entry, deletion of log files or transparent log file, generate of screenshots of the KWIC Lib suite Software Stock verification, stock entry, deletion of log files or transparent log file, generate of screenshots of the KWIC Lib suite software

**Implementation of Lib Suite**

When the library started using Lib Suite, the data for the one-by-one entry of the module gradually increased. Today, with the help of Lib Suite software, functions such as circulation, collection, cataloguing, and even serial control are implemented in different aspects of the library.

**Web OPAC**:

Web OPAC is available on the intranet for the student research scholars' Teaching and Non-Teaching faculty; there is a provision for Current awareness service (CAS) and Selective Dissemination of information (SDI). Global search, Title, Author, Series, and Keywords are the different searches available in OPAC.




**Bar Coding**: Bar codes have been activated for books, student cards, and e-books. Employee ID cards ultimately allow employees to process issues/returns in less time quickly.

With the help of Lib Suite software, circulation, collection or Acquisition, cataloguing, and even serial control in different aspects of automation are beginning to be implemented in libraries to provide users with better services. In a shorter time than manual processes. It facilitates the collection of various reports by day, week, month and year.

**Some Advantages of using Library software**:

**Improved Customer Service**: Library automation reduces part of the staff workload in Acquisition, cataloguing, and circulation. This extra time can lead to answering reference questions and helping users who have difficulty finding the correct information.

**Easier Access**: Automating library materials not only makes it easier to find books but automating library collections also makes libraries more flexible as demand increases.

**Collections:** Library automation can improve different types of document collections and the quantity and quality of documents available in library collections. It can also help remove old books and ancient documents from the group, making the library collections lighter and easier to find the right items.

No library can acquire materials and periodicals to satisfy user needs with a stipulated budget. In the implementation of automation, FST Hyderabad Library has provided access to some Online Databases like IEE(ASPP), Springer Engineering, J-Gate, Science and Technology, and a few online subscriptions of Sage and Global journals. These databases are beneficial to the users to satisfy most of their needs. No library has access to all types of documents and periodicals (journal and Magazines, and it cannot allocate a prescribed budget to meet all user needs. In terms of automation, the FST- Hyderabad library also provides online databases Current Status of the Library:

The library today has a collection of the following types of documents:

Books: 16361

Periodicals (Journals, magazine, IUP Journals: 55 E-Journals, News Papers)

Online Databases (IEEE, Springer Engineering, J-gate, Science and Technology (Ebsco)

**The outcome of the study:**

1. All library collections are in one database
2. He can fully control the collection and operation of the library
3. Easy to collect various reports by day, week, month and yearly
4. Teachers and students can check the required books via the web OPAC module
5. The library can share its data with other libraries in the department

## Conclusion:

Libraries today need technological change to meet the growing needs of users. Therefore, for any ever-increasing library, information technology must now be applied. The School of Engineering Technology libraries must use information management and technologies tools. In addition to automation, libraries must be prepared to meet the future needs of users.

FST Hyderabad Library benefits from library automation efforts. Providing web OPAC facilities to users via the intranet improves library information and images access. The implementation of automated services in a library is not a unique task. This requires continuous efforts to maintain standards and expand services through innovative ideas passed down from generation to generation. Another important activity is training user communities on using available facilities and getting feedback to improve benefits to meet user needs. Careful observation and systems are essential to keep up with technology and meet the growing needs of users of library information services. In the future, implementing RFID technology will be provided to meet users' needs effectively.

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# Information seeking behavior of public library user's in covid-19 pandemic: A survey

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***Abstract***

*This present study is based on the information seeking behavior of the public library users during the covid-19 circumstances. A survey was conducted with hundred questionnaires, distributed to users in public library using convenient sample method. The primary objective is to examine the users' information seeking behaviour during the pandemic situtaion and to identifying the most preferred information sources by users, relaid social media and investigating different purposes for seeking information related to COVID-19.*

**Keywords:** *Public library, pandemic, information seeking behavior, covid-19.*

## Introduction:

During the pandemic every sector in India and entire the world has been affected. The major sector under gone changes drastically is observed in information communication technology. The internet / network have allowed the flow of information flood in huge manner. Most of the information is redundant, unreliable and created panic situation among public. The people who seek information during this crisis have significant change in information seeking behavior. Majority of the public preferred social media, internet and other electronic media for information access. Even with the emergence of health information on increasingly diverse digital media platforms, relatively few studies have differentiated various digital media channels and explored their effects on behavioral performance. Here, comes the role of public library which can provide the credible information to the public. During the pandemic, many public library institutions have been shut down, some have allowed restricted access to public. The public libraries play major role in dissemination of information in particularly about covid-19 for information the cause, effect, prevention, treatment and other information regarding the virus. In the circumstances the study the public library user's information seeking behavior is observed during this pandemic and their most preferred information sources and the platform used in social media. In this study "Information seeking behavior of public

library user's in covid-19 pandemic: A survey", has been chosen to know the public library users information seeking behavior and platform used by them during pandemic are taken into consideration to know their information source used and their need of information.

## Objectives:

1. To know the users purpose of visiting the public library.

2. To know the category of information most searched by users during pandemic situation.

3. To know the most used social media platform by users in pandemic.

4. To know users most preferred information source in pandemic.

5. To know the problems faced by users in searching the information during pandemic situation.

## Methodology:

In the study, survey method was used for the collection of data from the public library users. A questionnaire was designed and distributed among the public library users. Hundred questionnaires were distributed to the library users by using accidental sampling method. The questionnaire contains the questions such as information needs, information seeking behavior, covid information, treatment and post covid information, availability of information in library etc., after collecting the data, the data was analyzed and interpreted in the form of tables.

## Scope and limitations:

The present study is limited to public library users in Tirupati. Due to Covid-19 circumstances data collection was limited to public library users available at the time of data collection from 19-02-2022 to 23-02-2022.**Analysis of data:**

## Gender

A question has been asked to the public library users to know their gender. The replies given by them are shown in table.6.1

**Table 6.1** Distribution of respondents according to gender

| Gender | Number | Percentage |
|---|---|---|
| Male | 67 | 67 |
| Female | 33 | 33 |
| **Total** | **100** | **100** |

It is clear from table.6.1 that the majority of respondents (67%) are male and remaining (33%) are female respondents. It is concluded from the study that a majority of male respondents are availing public library services.

**Age**

A question has been asked to the public library users to know their age. The replies given by them are shown in table.6.2

**Table 6.2** Distribution of respondents according to age

| Age | Number | Percentage |
|---|---|---|
| Below 15 years | 12 | 12 |
| 15 to 25 years | 72 | 72 |
| 25 to 35 years | 11 | 11 |
| 35 to 50 years | 4 | 4 |
| Above 50 years | 1 | 1 |
| **Total** | **100** | **100** |

It is clear from table.6.2 that the majority of respondents (72%) are under 15 to 25 years, followed by below 15 years (12%), 25 to 35 years (11%), 35 to 50 years (4%) and remaining (1%) are age above 50 years. It is concluded from the study that a majority of respondents are under the age of 15 to 25 years.

**Educational qualification**

A question has been asked to the public library users to know their qualification. The replies given by them are shown in table.3

**Table 6.3** Distribution of respondents according to qualification

| Qualification | Number | Percentage |
|---|---|---|
| Below $10^{th}$ class | 14 | 14 |
| Intermediate/ diploma | 11 | 11 |
| Graduate | 62 | 62 |
| Post graduate | 12 | 12 |
| Others | 1 | 1 |
| **Total** | **100** | **100** |

It is clear from table 6.3 that the majority of respondents (62%) is graduates, followed by below $10^{th}$ class (14%), post graduates (12%), intermediate (11%) and remaining (1%) are others. It is concluded that majority of respondents are graduates.

## Occupation

A question has been asked to the public library users to know their occupation. The replies given by them are shown in table.6.4

**Table 6.4** Distribution of respondents according to occupation

| Occupation | Number | Percentage |
|---|---|---|
| Student | 22 | 22 |
| Employee | 11 | 11 |
| Unemployed | 43 | 43 |
| Business | 2 | 2 |
| House wife | 4 | 4 |
| Retired staff | 18 | 18 |
| **Total** | **100** | **100** |

It is clear from the table.6.4 that a majority of respondents (43%) are unemployed, followed by students (22%), retired staff (18%), employee (11%), house wife's (4%) and remaining (2%) are business. It is concluded that majority of respondents are unemployed.

## Time spent

A question has been asked to the public library users to know the time spent by them in library. The replies given by them are shown in table.6.5

**Table 6.5** Distribution of respondents according to time spent in library

| No. of. hours spent in library | Number | Percentage |
|---|---|---|
| 0 to ½ hour | 41 | 41 |
| ½ to 1 hour | 14 | 14 |
| 1 to 2 hours | 18 | 18 |
| 2 to 3 hours | 16 | 16 |
| More than 3 hours | 11 | 11 |
| **Total** | **100** | **100** |

It is clear from the table.6.5 that a majority of respondents (41%) spend 0 to ½ hour, followed by 1 to 2 hours (18%), 2 to 3 hours (16%), ½ to 1 hour (14%) and remaining (11%) spend more than 3 hours in library. It is concluded that the majority of respondents spend 0 to ½ hour in library.

## Purpose of library visit

A question has been asked to the public library users to know their purpose of library visit. The replies given by them are shown in table.6.6

**Table 6.6** Distribution of respondents according to purpose of library visit

| Purpose | Number (n) | Percentage (n/159*100) |
|---|---|---|
| To read news papers and magazines | 32 | 20.12 |
| To borrow and return the books | 11 | 6.91 |
| To find information about employment | 19 | 11.94 |
| To prepare for competitive examinations | 42 | 26.41 |
| To improve general knowledge | 31 | 19.49 |
| To use the internet | 8 | 5.03 |
| To read reference materials | 4 | 2.51 |
| To read other books | 12 | 7.54 |

(Note: Multi- answers given by the respondents)

It is clear from table.6.6 that a majority of respondents (26.41%) visit library to prepare for competitive exams, followed by to read newspapers (20.12%), to improve general knowledge (19.49%), information about employment (11.94%), to read other books (7.54%), to borrow books (6.91%), to use internet (5.03%) and remaining (2.51%) are to read reference material. It is concluded that majority of respondents visit library to prepare for competitive exams.

## Information need in pandemic situation

A question has been asked to the public library users to know their information needs. The replies given by them are shown in table.6.7

**Table 6.7** Distribution of respondents according to their information needs

| Types of information need | Number (n) | Percentage (n/158*100) |
|---|---|---|
| Signs and symptoms of virus | 41 | 25.94 |
| Causes and treatments | 32 | 20.25 |
| Advice for individual having symptoms of virus | 11 | 6.96 |

| | | |
|---|---|---|
| Prevention and control of virus | 22 | 13.92 |
| Procedure to seek treatment at specialized center | 22 | 13.92 |
| Availability of vaccination centres | 16 | 10.12 |
| Information about booster doses | 14 | 8.86 |

(Note: Multi- answers given by the respondents)

It is clear from the table.6.7 that the majority of respondents (25.94%) need information on signs and symptoms of virus, followed by causes and treatment (20.25%), prevention and control (13.92%), seeking treatment at centre (13.92%), vaccination centre (10.12%), booster doses (8.86%) and remaining (6.96%) for advice individual having symptoms. It is concluded that the majority of respondents information need is on signs and symptoms of virus.

**Most preferred information sources**

A question has been asked to the public library users to know their preferred information sources. The replies given by them are shown in table.6.8

**Table 6.8** Distribution of respondents according to information sources

| Information sources | Number (n) | Percentage (n/257*100) |
|---|---|---|
| Dedicated websites on pandemic | 16 | 6.22 |
| Family members / friends / colleagues | 33 | 12.84 |
| Medical staff | 39 | 15.17 |
| News websites | 4 | 1.55 |
| News papers (online/print) | 41 | 15.95 |
| Posters/ brochures | 7 | 2.72 |
| Social media | 69 | 26.84 |
| Television | 48 | 18.67 |

(Note: Multi- answers given by the respondents)

It is clear from the table.6.8 that a majority of respondents (26.84%) information sources is social media, followed by television (18.67%),newspaper (15.95%), medical staff (15.17%), family/ friends (12.84%), dedicated websites on pandemic (6.22%),posters/brochures (2.72%) and remaining (1.55%) news websites. It is concluded that majority of respondents information sources is social media.

## Most active social media platform

A question has been asked to the public library users to know their most preferred social media. The replies given by them are shown in table.6.9

**Table 6.9** Distribution of respondents according to their activeness in social media

| Platform | Number (n) | Percentage(n/206*100) |
|---|---|---|
| Whats app | 72 | 34.95 |
| Youtube | 51 | 24.75 |
| Facebook | 41 | 19.90 |
| Instagram | 7 | 3.39 |
| Twitter | 32 | 15.53 |
| Telegram | 2 | 0.97 |
| others | 1 | 0.48 |

(Note: Multi- answers given by the respondents)

It is clear from table.6.9 that a majority of respondents (34.95%) active in whatsapp, followed by youtube (24.75%), facebook (19.90%), twitter (15.53%), instagram (3.39%), telegram (0.97%) and remaining (0.48%) use other social media platforms. It is concluded that majority of respondents most preferred social media is whatsapp.

## Problems faced searching information on pandemic

A question has been asked to the public library users to know their problems in information search. The replies given by them are shown in table.6.10

**Table 6.10** Distribution of respondents according to the problems faced in searching information

| Problems | Number (n) | Percentage (n/168*100) |
|---|---|---|
| Non availability of required information | 33 | 19.64 |
| Lack of Credibility of information on virus | 24 | 14.28 |
| Too much repetitive information available on the Internet | 39 | 21.42 |
| Frequent changes in information and content | 24 | 14.28 |
| Difficulty in understanding corona virus | 27 | 16.07 |

| | | |
|---|---|---|
| related information | | |
| Information is not available in my native language | 21 | 12.50 |

(Note: Multi- answers given by the respondents)

It is clear from the table.6.10 that a majority of respondents (21.42%) face problem with too much repetitive information on internet, followed by non availability of required information (19.64%), Difficulty in understanding corona virus related information (16.07%), Lack of Credibility of information on virus (14.28%), Frequent changes in information and content (14.28%) remaining (12.50%) problem due to Information is not available in my native language. It is concluded that majority of respondents face problem in information search because too much repetitive information available on the Internet.

**Findings:**

- A majority of male respondents are availing public library services and majority of respondents are under the age of 15 to 25 years.
- Majority of respondents are graduates and Majority of respondents are unemployed. Majority of respondents spend 0 to ½ hour in library.
- Majority of respondents visit library to prepare for competitive exams.
- Majority of respondents information need is on signs and symptoms of virus.
- Majority of respondents information sources is social media
- Majority of respondents most preferred social media is whatsapp.
- Majority of respondents face problem in information search because too much repetitive information available on the Internet.

**Conclusion:**

The major source of information was accessed through social media and television to the public. The respondents most preferred social media platform was whatsapp. A majority of respondents faced problem during information search was that there is too much of repetitive information available in electronic media and due to lack of credibility in information through internet sources.

**Suggestions:**

Health information should be provided in public library. 1/4$^{th}$ of the respondents replied on their need of information on signs and treatment. Hence, the government of Andhra Pradesh should provide the full information on covid treatment and post covid precautions. Majority of respondents getting information through social

media. So the information like health, education, employment, schemes of the government should be informed through the social media for effective dissemination of information among the public.

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# Web Analytics Tools Usage among Indian Library Professionals: A Survey

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## Abstract:

*The purpose of this study is to have a closer look at the web analytics tools usage among the library professionals in India. Present study investigates and explores the web analytic tools used by Indian library professionals to measure the statistics of their library websites. The investigators used an online social networking portal "LIS Links" to conduct an online survey with the help of Google forms and the final analysis were done with the valid responses. The responses were received from library professionals in India from all categories of institutions. The study also discusses about free and paid web analytics tools and the popular ones among the Indian libraries. The results may help the potential librarians to understand the tools and to use these in the effective way to improve library resources, services and products on the basis of metrics. Most of the respondents 189 (71.60%) are found that library professionals were well aware of the web analytics tools. The key findings of the present study shows that there are 24 (9.09%) libraries which either still have no library website.*

***Keywords:*** *Library websites; Web analytics; Web applications; Web metrics*

## Introduction:

The internet and web technology has changed the way people interrelate, interconnect, share and acquire knowledge. However, when the web was created it did not have features and facilities for users to interact. Web analytics tool can provide a better understanding of the user behaviors of its visitors who are using the website. The world is moving towards digital content, new tools and techniques have evolved to create a digital world where information can be retrieved easily

with the help of these tools and techniques. Libraries have benefited more through this revolution and have already been using many information communication technology tools to provide better digital services to the patrons. A library website is an important organ of the library to disseminate and communicate the information among clientele.

**Objectives of the Study:** The main objectives of the study are.

- To investigate the web analytics tools used by Indian libraries and to analyze their website metrics;
- To investigate the awareness of different paid and free web analytics tools popular among the library professionals in India;
- To find out the usage pattern of web analytics tools by the library professionals and availability of library websites;

## Methodology:

A structured questionnaire was designed and used for collecting data. With the help of Google forms which is a popular and free online tool through which different type of surveys can be conducted and shared easily. Questionnaire were distributed through an online social networking platform named 'LIS Links' which is a specialized social networking site, most popular among Indian library professionals pertaining only for library related activities. The investigators also distributed the questionnaire through an e-mail and in hard copies to collect the required data. Only 264 valid responses were received out of 350. The data was analyzed and interpreted.

## Data Analysis and Interpretation:

The received data was entered in numerical coded Excel sheet and different charts and diagrams were used to represent the analyzed data.

### 1. State-Wise Received Response

The Table 1 represents here the state-wise received responses, wherein Andhra Pradesh is at the top from where investigators received the highest number 34 (12.88%) of responses.

**Table 1**State Wise Received Response

| Name of the State | Received response | % |
|---|---|---|
| Andhra Pradesh | 34 | 12.88 |
| Telangana | 29 | 10.98 |
| Tamil Nadu | 23 | 8.71 |
| Kerala | 18 | 6.81 |
| Karnataka | 18 | 6.81 |
| Maharashtra | 15 | 5.68 |
| Odisha | 14 | 5.30 |
| Bihar | 11 | 4.17 |
| West Bengal | 11 | 4.17 |
| Assam | 10 | 3.79 |
| Haryana | 09 | 3.41 |
| Madhya Pradesh | 09 | 3.41 |
| Rajasthan | 09 | 3.41 |
| Gujarat | 09 | 3.41 |
| Punjab | 08 | 3.03 |
| Arunachal Pradesh | 07 | 2.65 |
| Chhattisgarh | 05 | 1.89 |
| Goa | 05 | 1.89 |
| Himachal Pradesh | 04 | 1.52 |
| Jharkhand | 03 | 1.14 |
| Manipur | 03 | 1.14 |
| Meghalaya | 02 | 0.76 |
| Mizoram | 02 | 0.76 |
| Nagaland | 02 | 0.76 |
| Sikkim | 01 | 0.38 |
| Tripura | 01 | 0.38 |
| Uttar Pradesh | 01 | 0.38 |
| Uttarakhand | 01 | 0.38 |
| **Total:** | **264** | **100.00** |

## Designation Wise Received Responses

The 264analysed received responses have been presented below in Table 2 designation-wise. All these respondents are directly or indirectly engaged in the library website maintenance/processes. The highest responses were received from the Assistant Librarians, i.e.142 (53.79%), followed by Librarians 79 (29.92), Library Assistant26 (9.85%), Assistant Professor 8 (3.03%), Associate professor 5 (1.52%), and Professor 4 (1.52%).

**Table 2** Total Responses received, Designation Wise

| Designation | Received response | % |
|---|---|---|
| Professor | 4 | 1.52 |
| Associate Professor | 5 | 1.89 |
| Assistant Professor | 8 | 3.03 |
| Librarian | 79 | 29.92 |
| Assistant Librarian | 142 | 53.79 |
| Library Assistant | 26 | 9.85 |
| **Total:** | **264** | **100.00** |

## Availability of Library Website

An essential enquiry made from each respondent was whether their library is has a website or not? It was found that 151(57.20%) respondents replied that they have library website, 89(33.71%) respondents stated that it is under process and remaining 24(9.09%) stated that they do not have it.

**Table 3**Availability of Library Website

| Your Library having Website | | |
|---|---|---|
| **Status** | **Received responses** | **%** |
| Yes | 151 | 57.20 |
| Under Process | 89 | 33.71 |
| No | 24 | 9.09 |
| **Total:** | **264** | **100.00** |

## 4. Awareness of Web Analytics Tools

Respondents about the awareness and knowledge of web analytics tools is found that 189 (71.60%) library professionals were well aware of the web analytics tools; while 75 (28.40%) library professionals were not aware. Table 4 and figure 4 represents below the responses of the respondents.

**Table 4** Awareness of Web Analytics Tools

| Do you know about Web Metrics/Web Analytical Tools | | % |
|---|---|---|
| **Yes/No** | **Received responses** | |
| Yes | 189 | 71.60 |
| No | 75 | 28.40 |
| **Total:** | **264** | **100.00** |

**Uses of Web Metrics/Web Analytical Tools**

The investigators asked the respondents whether they are using any web analytics tool to measure or analyzed their site statistics? Table 5 shows that 157 (59.47%) respondents are using web metrics/web analytical tools, while 107 (40.53%) respondents are not using web metrics/web analytical tools.

**Table 5** Uses of Web Metrics/Web Analytical Tools

| Are you using Web Metrics/Web Analytical Tools | | % |
|---|---|---|
| **Yes/No** | **Received responses** | |
| Yes | 157 | 59.47 |
| No | 107 | 40.53 |
| **Total:** | **264** | **100.00** |

**6. Categories of Web Analytics Tools**

Table 6 shows that 194 (73.48%) respondents provided response that they use free version of web analytics tool, while 70(26.52%) respondents are using paid version web analytical tools.

**Table 6** Categories of Web Analytics Tools

| Mention the Category of Web Analytics Tools | | % |
|---|---|---|
| **Yes/No** | **Received Responses** | |
| Free Version | 194 | 73.48 |
| Paid Version | 70 | 26.52 |
| **Total:** | **264** | **100.00** |

## 7. Name of the Web Analytical Tools

Table 7 shows that majority115 (43.56%) professionals/ respondents are using Google Analytics to monitor their site statistics, followed by 52(19.56%) respondents are using Adobe Analytics, 34 (12.88%) respondents are Mixpanel, 22 (8.33%) respondents are using Stat Counter, and Matoma, 7 (2.65%) respondents are YandexMetrica, 6 (2.27%) respondents are Amplitude, 3(1.14%) respondents are Baidu Analytics and HubSpot to monitor their site statistics.

**Table 7** Name of the Web Analytical Tools

| Name of the Web Analytical Tool | Received Responses | % |
|---|---|---|
| Google Analytics | 115 | 43.56 |
| Adobe Analytics | 52 | 19.70 |
| Mixpanel | 34 | 12.88 |
| Stat Counter | 22 | 8.33 |
| Matoma | 22 | 8.33 |
| YandexMetrica | 7 | 2.65 |
| Amplitude | 6 | 2.27 |
| Baidu Analytics | 3 | 1.14 |
| HubSpot | 3 | 1.14 |
| **Total:** | **264** | **100.00** |

## 8. Frequency of checking Web Statics

The investigators asked the respondents about the frequency of checking/analyzing the site metrics. It was found that 125 (47.35%) respondents are analyze their site metrics on monthly basis, 42 (15.91%) respondents are quarterly, 23 (8.71%) respondents are half-yearly, 22 (8.33%) respondents are annually, 33 (12.5%) respondents are as and when required, 6 (2.27%) respondents are frequency of checking/analyzing the site metrics on regularly, 5(1.89%) respondents are sometimes, 5 (1.52%) respondents are weekly and 5 (1.52%) Not Fix about the frequency of checking/analyzing the site metrics.

**Table 8**Frequency of checking Web Statics

| Frequency of Checking Web Statics | Received Responses | % |
|---|---|---|
| Monthly | 125 | 47.35 |
| Quarterly | 42 | 15.91 |
| Half-Yearly | 23 | 8.71 |
| Annually | 22 | 8.33 |
| As and when required | 33 | 12.5 |
| Regularly | 6 | 2.27 |
| Sometimes | 5 | 1.89 |
| Weekly | 4 | 1.52 |
| Not Fix | 4 | 1.52 |
| **Total:** | **264** | **100.00** |

**Major Findings:**

- The key findings of the present study shows that there are 24 (9.09%) libraries which either still have no library website.
- Most of the respondents 189 (71.60%) are found that library professionals were well aware of the web analytics tools.
- Most of 194 (73.48%) respondents provided response that they using free version of web analytics tool.
- Majority115 (43.56) professionals/ respondents are using Google Analytics to monitor their site statistics.
- Nearly half of 125 (47.35%) respondents are analyze their site metrics on monthly basis.

**Conclusion:**

The web analytic tools are utmost beneficial when combined and related with the other methods and findings while measurement the users' visiting data and behaviors for the purpose of upgrading of the website. A number of studies show that many researchers have used the mixed method approach before finalizing for the improvement in their website or portals by conducting the surveys from the users as well as through downloading the users' visit data with the help of web analytic tools. There is a inevitability to impart knowledge about such generous of tools to the library professionals who are not involved in this process. The web analytics tools afford an enhanced view and wide varieties of online connections and may help clearly for the better valuation of the websites.

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# Gap Analysis between the Usage and Satisfaction Levels of Online Databases: A Case Study Damodaram Sanjivayya National Law University, Visakhapatnam

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## INTRODUCTION

Libraries take part in a very significant role in sustaining lawful education and lawful research. The earlier period has brought about a sea of change in the relationship between library and user. Information technology enabled new products and services, and the availability of online digital resources has changed the provision of services in legal academic institutions. In this context, library professionals working in a legal academic library are required to have a sound knowledge of the information needs, perceptions and information-seeking behaviour of legal academicians and users to make certain solid collection development, to provide effective library services and to satisfy the needs of library users. Librarians are professionally committed to update a core, qualitative and need-based collection for the best utilization of the resources for the larger satisfaction of the user community. The purpose of this study is to determine the Damodaram Sanjivayya National Law University Library users' (DSNLUL) information needs and seeking behaviour to provide electronic databases/electronic resources in a better way.

## NEW TOOLS TO FIND LEGAL INFORMATION

Legal research is now often conducted in online commercial legal research databases such as Westlaw, Lexis India or other subject specific databases were access to the necessary documents and related analysis is often only few clicks

away. However, the value of online research platforms lies not only in having quick access to all this information, but also in the new means we have available to find and manipulate it. While indexes, tables of contents, and other key findings aids still exist on the more expensive online research platforms, the ability to search all this data is a powerful addition to research toolkits. And in some cases a tool that was powerful in print has been completely transformed in its online incarnation. Though the transition to online materials and the development of search capabilities have been the major technological advances in legal research of the last 2 decades, today new technologies and fields of study are being applied. New and old players in the legal research field are developing innovative tools using data analytics to find specific pieces of information in the ocean in a more cost efficient manner.

## DAMODARAM SANJIVAYYA NATIONAL LAW UNIVERSITY LIBRARY

DSNLU has provided necessary infrastructure to cater the needs of the user community. DSNLU Library is accessible to the Faculty members, students, Ph.D. and LL.D. Research Scholars & supporting staff. The University Library is also accessible to the students of the other institutions/ universities across India for reference and internship on due permission. DSNLU Library is fully air conditioned with seating arrangement for 200 users with Wi-Fi and is LAN enabled. Library will be open from 08:00 am to 09:00pm on all working days and from 09:00 am to 05:00 pm on Saturdays &Sundays. In addition, Library will be open from 08.00 am to 11.00 pm during Examinations, Moot courts, Parliament Debates, Quiz, etc.,

The following are the print and electronic resources available at Library:

| | | |
|---|---|---|
| 1 | Text/Reference Books | 14,312 Volumes |
| 2 | Donated Books | 2600 Volumes |
| 3 | Journals & Reports | 44 & 12 |
| 4 | Compendiums | 4 |
| 5 | Magazines & Periodicals | 15 & 12 |
| 6 | Online Resources(Annually Renewed) such as Westlaw, Hein, Manupatra, SSC, Lexis, Kluwer Competition law, Kluwer IP Law, Kluwer Arbitration Law, Taxmann, and JSTOR | 10 |

## METHODOLOGY

A methodology used for collecting data was questionnaire based. All the questions were specifically prepared and closely related with the use and future expectations of electronic databases. These questionnaires were randomly distributed to the DSNLU students and were successfully retrieved from students. A total of 300 questionnaires were distributed randomly to the DSNLU students, Out of which 225 were returned and used for data analysis. Out of the 225 students, 115 are female students, and 110 are male students.

## DATA ANALYSIS AND DISCUSSIONS

## USAGE AND SATISFACTION LEVELS OF ELECTRONIC DATABASES

To know the level of usage and satisfaction levels of students with regard to electronic databases namely, "SSC online, Westlaw India, Kluwer Arbitration, Kluwer Competition Law, Kluwer IP Law, Hein online, Manupatra, Lexis India, Taxmann and JSTOR" is described in the following paragraphs.

### *Usage level of electronic databases*

The allocation of students according to their usage levels of different electronic databases available in the library is shown in Table 1.

**Table 1** Usage level of electronic databases by the postgraduate students

| Electronic Databases | Level of Usage | | | | Total |
|---|---|---|---|---|---|
| | Highly | Frequently | Occasionally | Rarely | |
| SSC online | 41 (18.22) | 127 (56.44) | 33 (14.67) | 24 (10.67) | 225 (100.00) |
| Westlaw India | 55 (24.44) | 139 (61.78) | 17 (7.56) | 14 (6.22) | 225 (100.00) |
| Kluwer Arbitration | 27 (12.00) | 103 (45.78) | 61 (27.11) | 34 (15.11) | 225 (100.00) |
| Kluwer Competition Law | 36 (16.00) | 119 (52.89) | 44 (19.56) | 26 (11.55) | 225 (100.00) |
| Kluwer IP Law | 31 (13.78) | 113 (50.22) | 59 (26.22) | 22 (9.78) | 225 (100.00) |
| Hein online database | 51 (22.67) | 133 (59.11) | 21 (9.33) | 20 (8.89) | 225 (100.00) |
| Manupatra | 44 (19.56) | 131 (58.22) | 27 (12.00) | 23 (10.22) | 225 (100.00) |

***Contd…***

| Electronic Databases | Level of Usage | | | | Total |
|---|---|---|---|---|---|
| | Highly | Frequently | Occasionally | Rarely | |
| Lexis India | 41 (18.22) | 121 (53.78) | 39 (17.33) | 24 (10.67) | 225 (100.00) |
| Taxmann | 25 (11.11) | 101 (44.89) | 63 (28.00) | 36 (16.00) | 225 (100.00) |
| JSTIOR | 22 (9.78) | 103 (45.78) | 61 (27.11) | 39 (17.33) | 225 (100.00) |

It is evident from Table 1 that 56.44 percent of the students are using the 'SSC Online database' frequently, 18.22 percent of them are using highly, 14.67 percent of them are using occasionally, and the remaining 10.67 percent of them are using rarely.

Regarding to 'Westlaw India', 61.78 percent of the students are using frequently, 24.44 percent of them are using highly, 7.56 percent of them are using occasionally, and the remaining 6.22 percent of them are using rarely. Regarding to 'Kluwer Arbitration', 45.78 percent of the students are using frequently, 27.11 percent of them are using occasionally, 15.11 percent of them are using rarely, and the remaining 12 percent of them are using highly. Regarding to 'Kluwer Competition Law', 52.89 percent of the students are using frequently, 19.56 percent of them are using occasionally, 16 percent of them are using highly, and the remaining 11.55 percent of them are using rarely. Regarding to 'Kluwer IP Law', 50.22 percent of the students are using frequently, 26.22 percent of them are using occasionally, 13.78 percent of them are using highly, and the remaining 9.78 percent of them are using rarely. Regarding top 'Hein Online', 59.11 percent of the students are using frequently, 22.67 percent of them are using highly, 9.33 percent of them are using occasionally, and the remaining 8.89 percent of them are using rarely. Regarding to 'Manupatra', 58.22 percent of the students are using frequently, 19.56 percent of them are using highly, 12 percent of them are using occasionally, and the remaining 10.22 percent of them are using rarely. Regarding to 'Lexis India', 53.78 percent of the students are using frequently, 18.22 percent of them are using highly, 17.33 percent of them are using occasionally, and the remaining 10.67 percent of them are using rarely. Regarding to 'Taxmann', 44.89 percent of the students are using frequently, 28 percent of them are using occasionally, 16 percent of them are using rarely, and the remaining 11.11 percent of them are using highly. Regarding to 'JSTOR', 45.78 percent of the students are using frequently, 27.11 percent of them are using occasionally, 17.33 percent of them are using rarely, and the remaining 9.78 percent of them are using highly.

### *Satisfaction level of electronic databases*

The allocation of students according to their satisfaction levels of different electronic databases available in the library is shown in Table 2.

**Table 2** Satisfaction level of electronic databases by the postgraduate students

| Electronic Databases | Level of Satisfaction | | | | Total |
|---|---|---|---|---|---|
| | Fully | Fairly | Partially | Not much | |
| SSC online | 36 (16.00) | 121 (53.78) | 29 (12.89) | 39 (17.33) | **225 (100.00)** |
| Westlaw India | 63 (28.00) | 131 (58.22) | 18 (8.00) | 13 (5.78) | **225 (100.00)** |
| Kluwer Arbitration | 25 (11.11) | 97 (43.11) | 64 (28.45) | 39 (17.33) | **225 (100.00)** |
| Kluwer Competition Law | 31 (13.78) | 122 (54.22) | 41 (18.22) | 31 (13.78) | **225 (100.00)** |
| Kluwer IP Law | 24 (10.67) | 111 (49.33) | 53 (23.56) | 37 (16.44) | **225 (100.00)** |
| Hein online database | 47 (20.89) | 131 (58.22) | 19 (8.44) | 28 (12.45) | **225 (100.00)** |
| Manupatra | 41 (18.22) | 127 (56.45) | 19 (8.45) | 38 (16.88) | **225 (100.00)** |
| Lexis India | 38 (16.89) | 114 (50.67) | 42 (18.67) | 31 (13.77) | **225 (100.00)** |
| Taxmann | 21 (9.33) | 83 (36.89) | 66 (29.33) | 55 (24.45) | **225 (100.00)** |
| JSTIOR | 19 (8.44) | 77 (34.22) | 71 (31.56) | 58 (25.78) | **225 (100.00)** |

Table 2 shows that 53.78 percent of the law students are fairly satisfied with the 'SCC Online database', 17.33 percent of them are not much satisfied, 16 percent of them are fully satisfied, and the remaining 12.89 percent of them are partially satisfied. Regarding to 'Westlaw India database',58.22 percent of the law students are fairly satisfied, 28 percent of them are fully satisfied, 8 percent of them are partially satisfied, and the remaining 5.78 percent of them are not much satisfied. Regarding to 'Kluwer Arbitration database', 43.11 percent of the law students are fairly satisfied, 28.45 percent of them are partially satisfied, 17.33 percent of them are not much satisfied, and the remaining 11.11 percent of them are fully satisfied. Regarding to 'Kluwer Competition Law database', 54.22 percent of the law students are fairly satisfied, 18.22 percent of them are partially satisfied,

13.78 percent of them are not much satisfied, and the remaining 13.78 percent of them are fully satisfied. Regarding to 'Kluwer IP Law database', 49.33 percent of the law students are fairly satisfied, 23.56 percent of them are partially satisfied, 16.44 percent of them are not much satisfied, and the remaining 10.67 percent of them are fully satisfied. Regarding to 'Hein online database', 58.22 percent of the law students are fairly satisfied, 2.89 percent of them are fully satisfied, 12.45 percent of them are not much satisfied, and the remaining 8.44 percent of them are partially satisfied. Regarding to 'Manupatra database', 56.45 percent of the law students are fairly satisfied, 16.88 percent of them are not much satisfied, 18.22 percent of them are fully satisfied, and the remaining 8.45 percent of them are partially satisfied. Regarding to 'Lexis India database', 50.67 percent of the law students are fairly satisfied, 16.89 percent of them are fully satisfied, 18.67 percent of them are partially satisfied, and the remaining 13.77 percent of them are not much satisfied. Regarding to 'Taxmann database', 36.89 percent of the law students are fairly satisfied, 29.33 percent of them are partially satisfied, 24.45 percent of them are not much satisfied, and the remaining 9.33 percent of them are fully satisfied. Regarding to 'JSTOR database', 34.22 percent of the law students are fairly satisfied, 31.56 percent of them are partially satisfied, 25.78 percent of them are not much satisfied, and the remaining 8.44 percent of them are fully satisfied.

## OVERALL USAGE LEVEL OF ELECTRONIC DATABASES

In order to know the overall usage of various electronic databases by the law students of Damodaram Sanjivayya National Law University Library, responses of highly, frequently, occasionally, rarely, and not used are assigned the weightages of 4, 3, 2,1, and 0 respectively. The total weightage and mean weightage is calculated for each electronic database. Each electronic database has been ranked on the basis of its mean weightage.

Table 3 shows the ranks obtained by different electronic databases for the usage level of law students.

**Table 3** Relative usage level of electronic databases

| S. No | Name of the Electronic database | Total Weightage | Mean Weightage | Rank |
|---|---|---|---|---|
| 1 | Westlaw India | 685 | 3.04 | 1 |
| 2 | Manupatra | 646 | 2.87 | 2 |
| 3 | SSC online | 635 | 2.82 | 3 |
| 4 | Lexis India | 629 | 2.80 | 4 |

***Contd…***

| S. No | Name of the Electronic database | Total Weightage | Mean Weightage | Rank |
|---|---|---|---|---|
| 5 | Kluwer Competition Law | 615 | 2.73 | 5 |
| 6 | Kluwer IP Law | 603 | 2.68 | 6 |
| 7 | Kluwer Arbitration | 573 | 2.55 | 7 |
| 8 | Taxmann | 565 | 2.51 | 8 |
| 9 | JSTOR | 558 | 2.48 | 9 |
| 10 | Hein online | 665 | 2.30 | 10 |

It is obvious from Table 3 that the students preferred to use 'Westlaw India' electronic database heavily as compared to other electronic databases, which is followed by Manputra, SSC online, Lexis India, Kluwer competition law, Kluwer IP law, Kluwer arbitration, Taxmann, JSTOR and Hein online.

## OVERALL SATISFACTION LEVEL OF ELECTRONIC DATABASES

In order to know the overall satisfaction of various electronic databases by the law students of Damodaram Sanjivayya National Law University Library, responses of fully, fairly, partially, not much and not at all satisfied are assigned the weightages of 4, 3, 2,1, and 0 respectively. The total weightage and mean weightage is calculated for each electronic database. Each electronic database has been ranked on the basis of its mean weightage.

Table 4 shows the ranks obtained by different electronic databases for the satisfaction level of law students.

**Table 4**Relative satisfaction level of electronic databases

| S.No | Name of the Electronic database | Total Weightage | Mean Weightage | Rank |
|---|---|---|---|---|
| 1 | Westlaw India | 694 | 3.08 | 1 |
| 2 | Hein online | 647 | 2.86 | 2 |
| 3 | Manupatra | 621 | 2.76 | 3 |
| 4 | Lexis India | 609 | 2.71 | 4 |
| 5 | SSC online | 604 | 2.69 | 5 |
| 6 | Kluwer Competition Law | 603 | 2.68 | 6 |
| 7 | Kluwer IP Law | 572 | 2.54 | 7 |
| 8 | Kluwer Arbitration | 558 | 2.48 | 8 |
| 9 | Taxmann | 520 | 2.31 | 9 |
| 10 | JSTOR | 507 | 2.25 | 10 |

It is obvious from Table 4 that the students are more satisfied with the 'Westlaw India' as compared to other electronic database, which is followed by Hein online, Manputra, Lexis India, SSC online, Kluwer competition law, Kluwer IP law, Kluwer arbitration, Taxmann, and JSTOR.

## GAP ANALYSIS OF THE USAGE LEVEL AND SATISFACTION LEVEL OF ELECTRONIC DATABASES

The gap analysis identifies the performance of the libraries as perceived by law students. Gap analysis identifies the gaps between the usage levels and the satisfactory level of the electronic databases. The mean values are derived by subtracting the 'mean score of usage level from the 'mean score of satisfaction level'. This comparison reveals the gap analysis.

### *Gap analysis of the electronic databases*

Table 5 shows the performance gap between the usage level and satisfaction level of electronic databases as indicated by law students.

**Table 5**Performance Gap between usage level and satisfaction level of electronic databases

| S. No | Electronic Databases | Mean Values | | Performance Gap |
|---|---|---|---|---|
| | | Usage Level | Satisfaction Level | |
| 1 | Hein online | 2.30 | 2.86 | 0.56 |
| 2 | JSTOR | 2.48 | 2.25 | -0.23 |
| 3 | Kluwer Arbitration | 2.55 | 2.48 | -0.07 |
| 4 | Kluwer Competition Law | 2.73 | 2.68 | -0.05 |
| 5 | Kluwer IP Law | 2.68 | 2.54 | -0.14 |
| 6 | Lexis India | 2.80 | 2.71 | -0.63 |
| 7 | Manupatra | 2.87 | 2.76 | -0.11 |
| 8 | SSC online | 2.82 | 2.69 | -0.13 |
| 9 | Taxmann | 2.51 | 2.31 | -0.20 |
| 10 | Westlaw India | 3.04 | 3.08 | 0.04 |

Table 5 indicates the overall comparisons made at the outset, between the usage levels and satisfaction levels with regard to various electronic databases. It shows an absolute negative performance gap as indicated in various electronic databases such as JSTOR (-0.23), Kluwer Arbitration (-0.07), Kluwer Competition Law (-0.05), Kluwer IP Law, (-0.14), Lexis India (-0.63), Manupatra (-0.11), SSC

online (-0.13), and Taxmann (-0.20). However, a positive performance gap of 0.56 and 0.04 is noticeable in case of Hein online as well as Westlaw India online databases.

## CONCLUSION

The new generation of law students made use of texts in print but there was the expectation from them that digital sources would make their study easier. The study revealed that apart from the formal legal sources, law students are aware about use of electronic databases. The results of this research showed that law students used a range of legal electronic databases to pursue their preparation for assignments, examinations, gathering information for workshop/seminars, updated with latest domain knowledge, and conducting legal search information. The study revealed that a number of aw students preferred to use 'Westlaw India' electronic database heavily as compared to other electronic databases. The study also revealed that a number of law students are more satisfied with the 'Westlaw India' as compared to other electronic database, which is followed by Hein online, Manputra, Lexis India, SSC online, Kluwer competition law, Kluwer IP law, Kluwer arbitration, Taxmann, and JSTOR. The findings of this study will help library and information science practitioners working in academic law libraries to address the key factors which influence users' intention to seek information and to intensify their performance to meet user needs and perceptions. It will also be useful to them in collection development. The study is relevant and useful to those who are interested to know the trends of information needs and determine the information-seeking behaviour and users' perceptions for library resources of legal professionals. This study is also useful to librarians who are professionally committed to update a core, qualitative and need-based collection for the optimum utilization of the resources for the greater satisfaction of the user community.

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# THEME 6

# Open Access & Scholarly Communication & Free and Open Source Software

# Open Access and Scholarly Communication Initiatives by the National Agricultural Research and Education System (Nares) of India

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## ABSTRACT

*Open access (OA) initiative emerged as a revolutionary movement that promotes free access to scholarly publications over the Internet, removes the price and permission barriers and ensures the widest possible dissemination of research. India ranks number 15 and 17 globally for OA journals and OA repositories, with 317 journals and 98 repositories. India's proportion to OA publications is 23% (7% below the world average of 30%) and the annual growth rate of OA publications is around 18%. Keeping pace with the developments taking place in open access movement and scholarly communication, the National Agricultural Research and Education System (NARES) of India has taken many laudable initiatives at national level viz., AGRICAT (Union Catalogue of Indian Agricultural Libraries), KrishiKosh, Consortium for e-Resources in Agriculture (CeRA), e-PKSAR, e-Krishishiksha, Open Access Expert and Decision Support Systems viz., Mushroom Agridaksh, Wheat Expert System, E-Platform for Seed spices growers, Rice expert systems for major pests and diseases, etc. This paper attempts to highlight the open access and scholarly communication initiatives of the NARES, INDIA, one of the biggest educational and research systems in the World.*

**Keywords:** *Open access initiative, scholarly communication, NARES, ICAR, India, AgriCat, IDEAL, KrishiKosh, e-Krishishiksha, Expert System, Decision Support System*

## INTRODUCTION

The present-day society is largely depending on information to sustain in the society, as it is also essential to perform any task being it a personal, professional, organizational and what not. Whatever we do in this society is depends upon the information we possess. At this juncture we must make a note of information rich and information poor. Open Access can bridge the gap between

the information rich and information poor through the availability and accessibility of information freely, easily without any restrictions to all. Open access (OA) initiative emerged as a revolutionary movement that promotes free access to scholarly publications over the Internet, removes the price and permission barriers and ensures the widest possible dissemination of research. This paper attempts to highlight the open access and scholarly communication initiatives of the NARES, INDIA, one of the biggest educational and research systems in the World.

## OPEN ACCESS

The concept of open access emerged in response to the restrictive access to knowledge in scholarly and scientific journals imposed by commercial publishing houses via subscription fees, license fees or pay-per-view fees. The Budapest Open Access Initiative (2002) defines open access as "free availability on the internet, permitting users to read, download, copy, distribute, print, search, or link to the full texts of these articles, crawl them for indexing, pass them as data to software, or use them for any other lawful purpose, without financial, legal or technical barriers other than those inseparable from gaining access to the internet itself." Open access is not just 'free access' but it is a step ahead of "Free Access" which removes just the price barriers by providing free access to end users. Under OA, the end user not only has free access to the content but also have the right to further distribute the content.

## OPEN ACCESS INITIATIVES IN INDIA and at Global levels

### Access to Global Online Research in Agriculture (AGORA)

Food and Agriculture Organization, United Nations together have initiated it. The AGORA is tie up with major publishers and provides online free access to nearly 900 commercially published journals in the fields of Food, Agriculture, Environment Sciences and allied disciplines in 113 developing countries all over the world. These are some of the important initiatives for promoting open access at global level. Although neither of these early initiatives outlined the impact or implications of the open access movement on developing countries, there is the philosophical imperative intrinsic that the idea of free, equal and open access would apply to all communities and countries.

Keeping pace with the developments taken place across the globe in the area of open access, there have been various initiatives by the Indian institutes, journals as

well as publishers to make research content open. The following are some of the early and significant open access initiatives in India.

The Indian Medlars Centre (IMC), set up jointly by the National Informatics Centre and the Indian Council of Medical Research, has taken the pioneering step of putting Indian biomedical journals accessible from a single platform. IMC's first bibliographic database IndMed, established in 1998, provides abstract level information from more than 70 journals. In 2003, IMC launched its full-text database, MedInd, which now hosts full text version of 38 journals in PDF format. This became the One-point resource of peer reviewed Indian biomedical literature covering full text of IndMED journals.

The Indian Academy of Sciences (IAS), founded in 1934, publishes 11 journals with the basic philosophy that no journal published by the Academy is in competition with another journal published in the country. Current Science, published by the Current Science Association in collaboration with the IAS, has entire back volumes from 1932 online in PDF format and has been online since 1999.

The Indian National Science Academy (INSA), established in 1935, publishes four journals including the Proceedings of INSA. Under the project 'Building Digital Resources: Creating Facilities at INSA for hosting S & T Journals on Online', INSA launched the Open Access version of these journals in December 2003.

Further, few universities and professional societies who are publishing journals started providing them in open access mode. On the other hand, many private and commercial publishers started a huge number of journals in the name of open access and started collecting article processing charges from the authors and publishing poor quality journals which paved the way for predatory publishing in a large scale in India.

According to a study by Nazim et al (2022), India ranks number 15 and 17 globally for OA journals and OA repositories, with 317 journals and 98 repositories. Although India's proportion to OA publications is 23% (7% below the world average of 30%), the annual growth rate of OA publications is around 18%. Although the governing bodies and institutions have made efforts to mandate researchers to adopt OA publishing and self-archiving, its implementation is quite low among Indian researchers, as only three institutions (out of 18 listed in the

ROARMAP) are defined the embargo period. It has been observed that most of the funding agencies in India do not provide financial assistance to authors for the payment of Article Processing Charges despite mandates that research is deposited in OA repositories. Further, India lacks a national OA policy but plans to implement a "one nation one subscription" formula to provide OA to scientific literature to all its citizens. It is hoped that these shortcomings will be addressed by the concerned regulatory bodies on priority basis. In this context, the Indian Council of Agricultural Research (ICAR) which is the apex body responsible for agricultural education and research in India comprising of ICAR Institutes and State and Central Agricultural Universities, which is known as "NARES" has taken a lot of laudable initiatives with regard to open access and scholarly communications to ensure quality agricultural education and research in the Indian Sub-continent.

## NATIONAL AGRICULTURAL RESERCH AND EDUCATION SYSTEM (NARES)

The Indian National Agricultural Research and Education System (NARES) is one of the biggest academic and research systems in the world, effectively working in close association with agricultural research, education and extension. The contributions of NARES in meeting the challenges of country's food problem and Green Revolution is well known. NARES is comprising of mainly the research institutions under Indian Council of Agricultural Research (ICAR), State Agricultural Universities (SAUs) and Krishi Vigyan Kendra (KVK, Farm Science Center) and strives for agricultural growth and prosperity in the country.

## OPEN ACCESS INITIATIVES OFTHE NATIONAL AGRICULTURAL RESEARCH AND EDUCATION SYSTEM (NARES), INDIA

The NARES has huge repository of knowledge and information on crop sciences, horticulture, resource management, animal sciences, agricultural engineering, fisheries, agricultural extension and agricultural education. In the present age of globalization, technology is changing at a very fast pace. Strengthening of libraries and capacity building in ICAR Research Institutes and SAUs is crucial for digitally sharing knowledge in cost effective manner. These libraries need updated infrastructure to face the technological challenges. There are more than 123 libraries in ICAR Institutions and SAUs. Some of these libraries are old having vast collection; whereas others have recently started building their collection and services. In the present case, consortium of 12 libraries was formed

as a pilot for implementation of the project "Strengthening of digital library and information management under NARES (eGranth)" funded by World Bank through National Agricultural Innovation Project (NAIP). Under this project centralized infrastructure has been created for hosting the Digital Repository and Integrated Library Management Software (ILMS) 'Koha' on SaaS model at Indian Agricultural Research Institute (IARI), New Delhi. After the pilot studies in 12 libraries, the consortium has been extended to include 38 libraries.

## AGRICAT

Developed under eGranth in collaboration with Online Computer Library Center, Inc. (OCLC), Dublin, Ohio, USA, AgriCat is a union catalogue of 12 agricultural libraries, useful to all library users as well as librarians. AgriCat helps in locating and sharing materials among group of libraries. Duplication of effort in record creation (cataloguing) is avoided by pooling the efforts through common electronic protocols. Indian National Agricultural Research System (NARES) has a very large collection of printed resources in agriculture and allied sciences, spread all over the country in different libraries of ICAR institutes and State Agricultural Universities. AgriCat being a common union catalogue of these valuable archives allows sharing and online access to researchers, teachers and students and other stakeholders to which they would not otherwise have access. AgriCat has been developed as subset of WorldCat using 'connexion' middleware tool for cataloguing following international standards.

Second version of AgriCat has been developed indigenously based on Koha by integrating catalog data of 38 partner libraries and has similar or better features than AgriCat developed as subset of WorldCat. AgriCat-2.0 is fully integrated with Koha local library management system, thus avoiding need for using middleware to upload record and then importing it to local library management system, saving the time and effort.

These initiatives have very high potential of bringing all library and knowledge resources of NARES on unified digital platform developed under e-Granth, thus making easy access to institutional knowledge leading to improved quality of research and academics in NARES. AgriCat-2.0 may be used for resource sharing by article exchange and inter library loans, acquisition planning to economize the shrinking funds. Practically, AgriCat virtualizes the complete experience of 'Physically visiting the library, searching through the catalogue, going to stacks/racks, taking out the desired book and browsing through it, before

borrowing it. Sitting at your desk or in comfort of your home, you can do this by few clicks, using AgriCat-2.0. The Homepage of IDEAL platform is illustrated in Figure-1.




Fig-1. Homepage of IDEAL

## KRISHIKOSH: AN INSTITUTIONAL REPOSITORY UNDER NATIONAL AGRICULTURAL RESEARCH SYSTEM (NARES)

KrishiKosh is a digital repository of accumulated knowledge in agriculture and allied sciences, having collection of old and valuable books, old journals, theses, research articles, popular articles, monographs, catalogues, conference proceedings, success stories, case studies, annual reports, newsletters, pamphlets, brochures, bulletins, summary of the completed projects, speeches and other grey literatures spread all over the country in different libraries of ICAR Research Institutions and State Agricultural Universities.

The KrishiKosh acts as digital platform to preserve institution's intellectual assets and help in providing and managing open access to institution's intellectual assets. ICAR has recently declared an Open Access policy. KrishiKosh provides ready software platform to implement all aspects of the open access policy, similar

to 'Cloud Service' for individual institution's self-managed repository with central integration of all individual repositories. At present KrishiKosh has 16 million digitized pages in 50,000 digital items (volumes) like old books, old Journals, reports, proceedings, reprint, research highlights, training manuals, historical records, including 9,314 theses taken from KrishiPrabha plus digitized at various centers. While migrating from KrishiPrabha, value addition has been done by making theses full Text searchable.

One of the important features of KrishiKosh is PDF/A format (ISO19005-1:2005) which is international standard format not dependent on Adobe and suitable for archiving as it has all the dependencies build into the document for proper display even with the future technologies. For semantic search, agrotagger, a computerized tool developed by IIT Kanpur based on agrotags which are carefully selected and validated subset of Agrovoc of FAO, has been integrated with DSpace, an open source software which is behind KrishiKosh. Automatically generated 'agrotags' replace the keywords in KrishiKosh for providing intelligent search. The KrishiKosh homepage is illustrated in Figure-2.

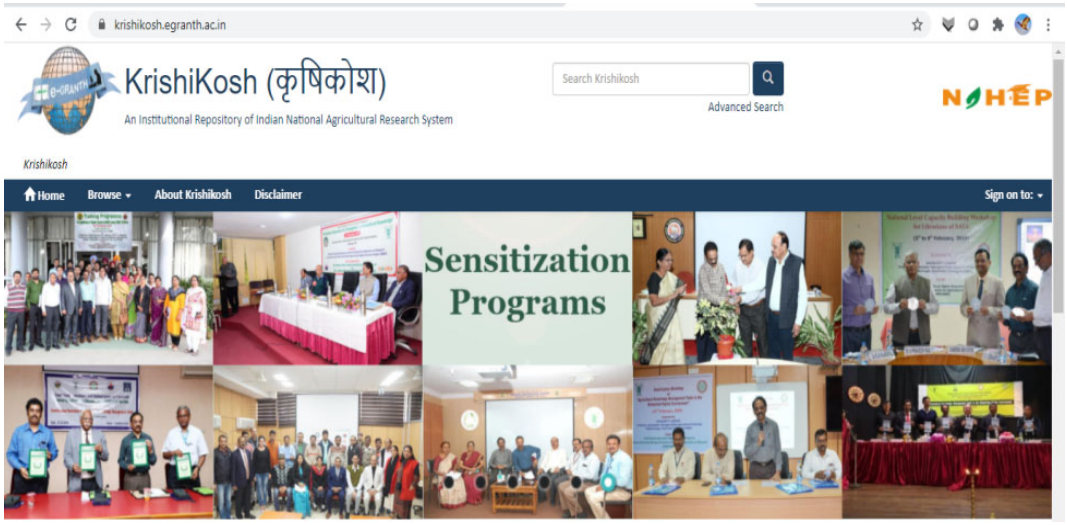



Fig-2. Homepage of KrishiKosh Institutional Repository

## KRISHIPRABHA: INDIAN AGRICULTURAL DOCTORAL DISSERTATIONS REPOSITORY

KrishiPrabha is a full text database of Indian Agricultural Doctoral Dissertations submitted by research scholars to the 45 State Agricultural

Universities and Deemed Agricultural Universities from 01-01-2000 to 31-12-2014. The database listing about 10,500 Dissertations in all agriculture and allied disciplines. It is now being clubbed with KrishiKosh for continuous upload of theses and other institutional repositories. It has been created by Nehru Library, Ch. Charan Singh Haryana Agricultural University, Hisar with financial support from Indian Council of Agricultural Research, New Delhi under its National Agricultural Innovation Project. There were 45 Ph.D. awarding Agricultural Universities/Deemed Agricultural Universities/ICAR Institutes in India. The KrishiPrabha has been now merged with Krishikosh

## CONSORTIUM e-RESOURCES IN AGRICULTURE (CeRA)

Since ICAR is having network connectivity across institutes and state agricultural universities, selected journals could be made available over the network for the use of scientific community. Accordingly, the National Agricultural Innovation Project (NAIP) has funded for establishing the Consortium for e-Resources in Agriculture (CeRA) at the Indian Agricultural Research Institute (IARI) in November 2007 to facilitate accessibility of scientific journals to all researchers / teachers in the National Agricultural Research System by providing access to information specially access to journals online which is crucial for having excellence in research. At Present CeRA is subscribing more than 2,670 journals and also providing content of more than 600 open access journals.




Fig-3. Homepage of Consortium for e-Resources in Agriculture (CeRA)

## e-PUBLISHING AND KNOWLEDGE SYSTEM IN AGRICULTURAL RESEARCH (e-PKSAR)

A project on e-Publishing and knowledge System in Agricultural Research was launched in 2009 by NAIP under DIPA (then "Directorate of Information and Publications of Agriculture", now "Directorate of Knowledge Management in Agriculture") with aim to provide improved communication link among information generators and its users for poverty alleviation and income generation. This project is designed to develop fully automated online publishing system of agricultural research information. Currently more than twenty very renowned Indian agricultural journals have been made web enabled under this project where one can submit and use online theirs research articles. This uses Open Journal System 2.4.5.0, which is open source journal management and publishing software developed, support, and freely distributed by the Public Knowledge Project under the GNU General Public License.




Fig-4. Homepage of E-PUBS

## e-KRISHISHIKSHA: AN E-LEARNING PORTAL ON AGRICULTURAL EDUCATION

For Agricultural Education, the Indian Council of Agricultural Research (ICAR) under financial support of National Agricultural Innovation Project (NAIP) has taken an initiative to develop UG level interactive & multimedia e-Course contents in seven major discipline viz. Agricultural Science; Fisheries Sciences;

Dairy Sciences; Veterinary and Animal Husbandry; Horticultural Science; Home Science and Agricultural Engineering. The e-Course contents are developed by Subject Specialist of respective discipline at State Agricultural Universities (SAUs) & Deemed to be Universities (DUs) in India under Moodle's platform. The course material is strictly prepared as per ICAR approved syllabus for the benefit of under-graduate students already enrolled in Indian Agricultural Universities. To provide free online access of the interactive & multimedia UG level e-Courses contents a centralized e-Learning portal that provides 24/7 services to all on the web accessible at http://ecourses.iasri.res.in for the users' community. The online access of e-Course contents is made available as guest users. This portal has developed under open source software Moodle.

## EXPERT SYSTEM (WHEAT)

EXOWHEM is a web-based Expert System developed for the wheat growing farmers of India. It provides the complete information about the Wheat Crop Management in the country. It advises wheat varieties on the basis of area, cultural and climatic conditions and other characteristics of farmer's interest. It also suggests the appropriate cultural practices like field preparation, fertilizer application, schedule of irrigation etc. It guides them in protecting the crop from insects/diseases/weeds etc. It also provides solution to the problems faced by the farmers through online queries.




Fig-5. Homepage of Expert System on Wheat

## RICE EXPERT SYSTEM FOR MAJOR PESTS AND DISEASES

A web-based expert system has been developed to identify and analyse the situation pertaining to important rice pests and diseases. The knowledge base contains general decision rules that represent the knowledge of experts on pests and diseases. It has 90 rules for identifying insect pests and 105 rules for identifying diseases. An interface was developed with questionnaire supported by popup menus, list boxes including images for each item in the drop-down menus. An inference mechanism was developed using ASP.Net to conduct formalized reasoning for user answers and corresponding rules in the knowledge-base. A separate module was called for control measures as biological, cultural, chemical and resistant varieties.

These control measures are recommended based on the stage of crop, type of pest, nature and extent of damage and economic threshold level. User interface is completely menu driven with combo boxes, option groups for selecting answers to multiple choice questions and most of the questions were aided by images for ease of user work. This system aids progressive farmers and agricultural extension officers in hastening the decision-making process.

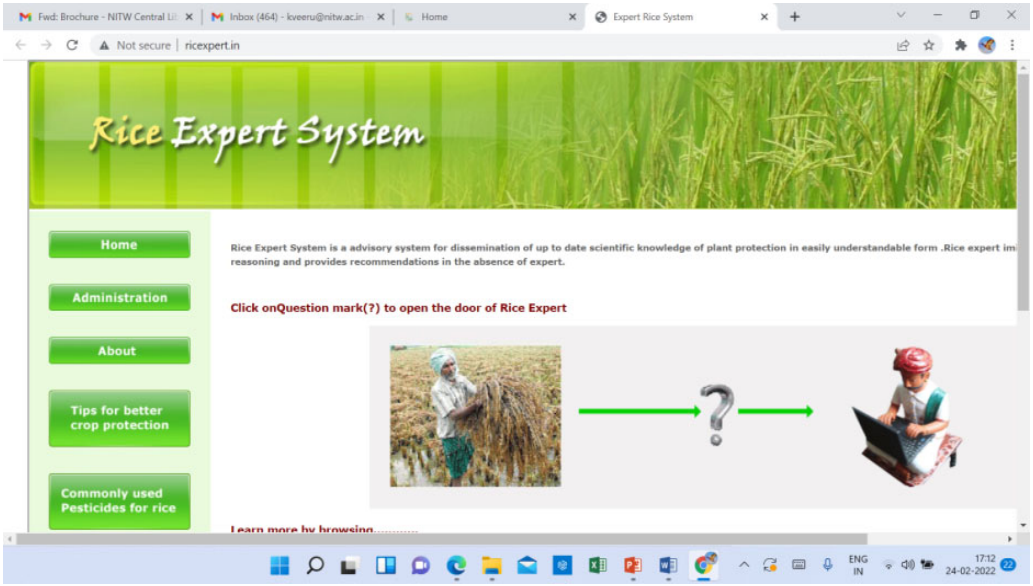



Fig-6. Homepage of Expert System on Wheat

## MUSHROOM AGRIDAKSH

Expert System for Mushroom Crop has been developed using AgriDaksh. This system is a farmer oriented and user-friendly software which provides spectrum of information with images of mushroom crop such as cultivation technology of different mushrooms, diseases and pest management, spawn production technology, compost preparation by short & long method, Post-harvest handling & harvesting, Crop management, Nutrition & medicinal value, Transfer of technology, Fungal, viral, bacterial diseases & abiotic disorders etc.

The Cultivation Technology module gives detail information about compost preparation, spawning, spawns running, casing, fruiting. Post-harvest management module gives detail information about Packing and Storage and Short-Term Storage. Pest & Diseases module gives detail information about Insect, Pest like Nematodes, mites and springtails and several diseases like Dry Bubble (brown spot), Wet Bubble (White Mould), Cobweb, Green Mould, False truffle (Truffle disease) etc, and timely control measures against pests & diseases.

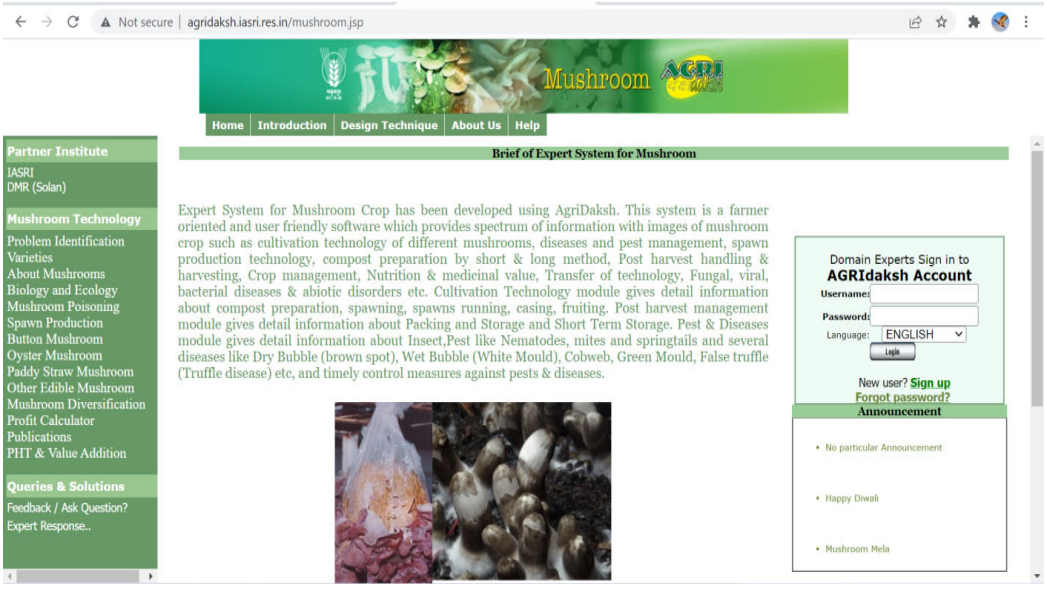



Fig-7. Homepage of Mushroom

## E-PLATFORM FOR SEED SPICES GROWERS

The "e-platform" is the software service that delivers over the Internet the application that you need to effectively manage your enterprise. For the first time it has been developed for agriculture-based enterprise. It is available on demand allowing a person to easily access the information available on seed spice crops regarding production technology, market information, export potential, industrial demands etc. This platform will be useful for farmers, extension workers and other stake holders to know the developments in the area of the crop domain. The e-platform framework has designed to speed up the development of scalable and maintain able web applications. This framework is based on enterprise application architecture, with the intention of tailoring solutions using standard components. The solution may be adaptable to specific business needs, both in terms of functionality and integration with existing systems developed in the area.

With the advancement in technology, internet access has been provided in rural areas in all agricultural regions. The farmers can use the web for finding out about crop management, market information, export sales and historical data, as well as can know which crop he should grow in his region to obtain maximum profits.




Fig-8. Homepage of E-Platform for Seed Spices Growers

## KRISHI- KNOWLEDGE BASED RESOURCES INFORMATION SYSTEMS HUB

KRIHI - Agricultural Knowledge Resources and Information System Hub for Innovations, is an initiative of Indian Council of Agricultural Research (ICAR) to bring its knowledge resources to all stakeholders at one place. The portal is being developed as a centralized data repository system of ICAR consisting of

Technology, Data generated through Experiments/ Surveys/ Observational studies, Geo-spatial data, Publications, Learning Resources etc.

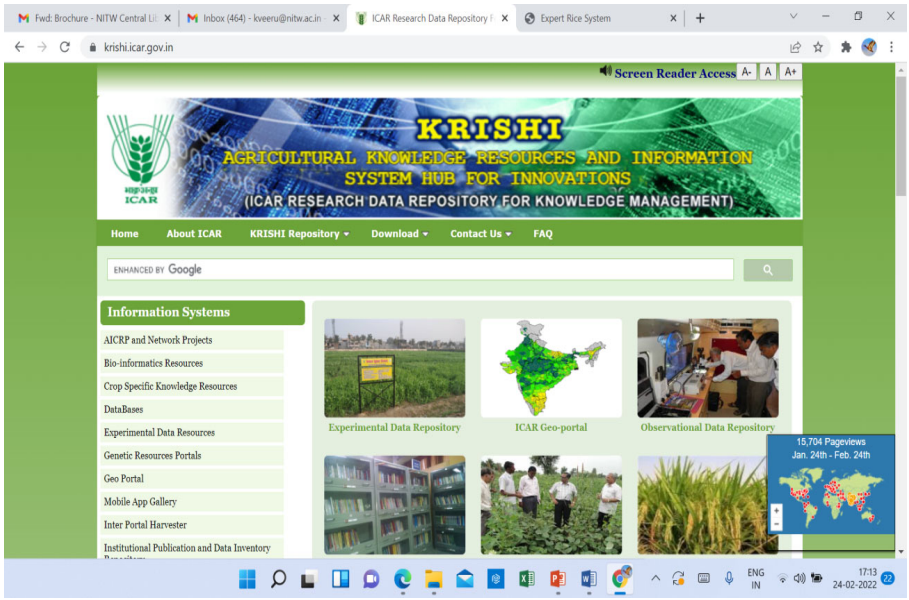



Fig-9. Homepage of KRIHI

The important open access and scholarly communication initiatives of the NARES are furnished in Table-1.

Table -1 Open Access Resources of NARES

| Sl. No. | Name of the Resources | URL |
|---|---|---|
| 1. | Krishikosh : An Institutional Repository Under National Agricultural Research System (NARES) | http://krishikosh.egranth.ac.in/ |
| 2. | Agricat-II/IDEAL | http://agricat.egranth.ac.in<br>http://ideal.egranth.ac.in |
| 3. | Consortium e-Resources in Agriculture (CeRA) | www.jgateplus.com |
| 4. | e-Publishing and Knowledge System in | http://epubs.icar.org.in |

| | | |
|---|---|---|
| | Agricultural Research (E-PKSAR) | |
| 5. | e-Krishishiksha : An E-Learning Portal on Agricultural Education | http://ecourses.iasri.res.in/ |
| 6. | Mushroom Agridaksh | http://agridaksh.iasri.res.in/mushroom.jsp |
| 7. | Expert System (Wheat) | http://apps.iasri.res.in/wheat/ |
| 8. | E-Platform for Seed Spices Growers | http://apps.iasri.res.in/exps/ |
| 9. | Rice Expert System for Major Pests and diseases | http://ricexpert.in/ |
| 10. | Krishi-Knowledge Based Resources Information Systems Hub | https://krishi.icar.gov.in/index.jsp |

## OPEN ACCESS POLICY OF ICAR

Indian Council of Agricultural Research (ICAR) has taken a major initiative towards Open Access by adopting OA policy on 13th September, 2013. The OA Policy draft of the ICAR (2013) was put for the wider public comments up to 23rd May, 2013. In response to this a modified draft proposal was submitted by the Open Access Community to ICAR for consideration. Some of these modifications were incorporated in the final draft adopted by ICAR. The decision to frame OA policy shows the long-term commitment of the organization for the Open Access.

- ✓ Each ICAR institute to setup an Open Access Institutional Repository.
- ✓ ICAR shall setup a central harvester to harvest the metadata and full-text of all the records from all the OA repositories of the ICAR institutes for one stop access to all the agricultural knowledge generated in ICAR.
- ✓ All the meta-data and other information of the institutional repositories are copyrighted with the ICAR. These are licensed for use, re-use and sharing for academic and research purposes. Commercial and other reuse requires written permission.
- ✓ All publications viz., research articles, popular articles, monographs, catalogues, conference proceedings, success stories, case studies, annual reports, newsletters, pamphlets, brochures, bulletins, summary of the completed

projects, speeches, and other grey literatures available with the institutes to be placed under Open Access.

- ✓ The institutes are free to place their unpublished reports in their open access repository. They are encouraged to share their works in public repositories like YouTube and social networking sites like Facebook®, Google+, etc. along with appropriate disclaimer.
- ✓ The authors of the scholarly articles produced from the research conducted at the ICAR institutes have to deposit immediately the final authors version manuscripts of papers accepted for publication (pre-prints and post-prints) in the institute's Open Access repository.
- ✓ Scientists and other research personnel of the ICAR working in all ICAR institutes or elsewhere are encouraged to publish their research work with publishers which allow self- archiving in Open Access Institutional Repositories.
- ✓ The authors of the scholarly literature produced from the research funded in whole or part by the ICAR or by other Public Funds at ICAR establishments are required to deposit the final version of the author's peer-reviewed manuscript in the ICAR institute's Open Access Institutional Repository.
- ✓ Scientists are advised to mention the ICAR's Open Access policy while signing the copyright agreements with the publishers and the embargo, if any, should not be later than 12 months.
- ✓ M.Sc. and Ph.D. thesis/dissertations (full contents) and summary of completed research projects to be deposited in the institutes open access repository after completion of the work. The metadata (e.g., title, abstract, authors, publisher, etc.) be freely accessible from the time of deposition of the content and their free unrestricted use through Open Access can be made after an embargo period not more than 12 months.
- ✓ All the journals published by the ICAR have been made Open Access. Journals, conference proceedings and other scholarly literature published with the financial support from ICAR to the professional societies and others, to be made Open.
- ✓ The documents having material to be patented or commercialized, or where the promulgations would infringe a legal commitment by the institute and/or the author, may not be included in institute's Open Access repository. However, the ICAR scientists and staff as authors of the commercial books may negotiate

with the publishers to share the same via institutional repositories after a suitable embargo period.

## CONCLUSION

The open access initiative has taken great stride in its effort to provide equal access to knowledge to all people irrespective of where they live. One of the great beneficiaries of the initiative will be the developing world. In this context, the Indian National Agricultural Research & Education System (NARES), a comprehensive source of knowledge in agriculture and allied sciences consisting of vast collection of rare and valuable books, reports, theses, surveys, statistical data, maps, bulletins, newsletters, journal back volumes and other documents held by libraries of different Agricultural Research Institutes and State Agricultural Universities spread all over the country, has taken laudable initiatives to extend the invaluable resources available in the NARES through open access through KrishiKosh, E-PUBS, CeRA, etc.

The initiatives taken by the ICAR during the past two decades decade made the NARES one among the great systems around the globe which promotes open access and scholarly initiatives very effectively. This study would like to suggest that a national level body like INFLIBNET Centre (Inter-University Centre of UGC) may be established by the ICAR to network all library and information centres of NARES and also to take care of open access and scholarly communication initiatives more effectively. Similarly, the ICAR may made it mandatory to publish all its funded research project outcomes in open access journals so as to ensure the growth of open access to scientific literature by the stakeholders.

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# Open Data, Open Research and Open Knowledge: Relevance for Higher Academic Research

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## Abstract

*This paper discusses the concept of openness in general and its implementation in access outcome of Higher Academic Research. Though idea of directness i.e. open science and open access to information sources is not new, it is still not universally accepted and it is not understood equally in all parts of the world. The greatest benefits of open access can be observed in academic activities i.e. in research and teaching at academic institutions. However, open access is not understood and presented equally everywhere. There are differences in openness and rights of users in access and use of scientific and educational materials in open access digital repositories. While the number of open access digital repositories increases there are many questions waiting to be answered from quality of content, roles in management of open access information resources, responsibility for maintenance of digital information resources, financing of digital information resources, quality of scientific and educational digital resources etc. but at the same time the attitude of sharing the research process, research data even before the completion of ongoing research and the publication of results in formal scholarly communication channels as the awareness particularly among the elite scientific and academic community and free of the international funding organisations. The awareness of openness in sharing the datasets, protocols and preliminary research results gained momentum. It has opened there is the path for the research data repositories and forums that can be maintain digitally with open access source enable the researcher and scientist to work collaboratedly in that*

*and to channelize the research in right direction at the early stages towards the enhanced research benefits*

**Keyword**: *Open Research. Open Data, Open Education, Open Repositories, Open Science,*
*Citizen Science, and Scholarly Communication*.

## Introduction

The definition dimension, the relevance and context of research particularly the higher education institutions have had drastic changes which come across cycles of changes with blend of traditional and modern methods of research, basic and applied approach of research, individual and collaborative research and integration of formal and informal researchers and practitioners. The advantage of technology through a lot of opportunities, particularly the information technology venture into all specific domains completely reshaped the pattern of research. As the outcome the academic research starts from undergraduate level at even the small and remote undergraduate college, standard alone institutions and colleges instead universities and larger setup of higher education institutions. Knowledge generation, capturing and sharing become viable for everyone who is having attitude and interest due to the digital technologies and online platforms. All these made a great revolution in terms of making available the thought content in public domain, which was coined as open access, the same was advocated by O'Reilly **[1]** the exponent of web 2.0, which made web as a platform for every individual to participate interact and contribute the literature in various formats. This possibility enabled a great number of institutions, research organisations and national governments to make available the scholarly research outcome in the public domain for unrestricted information access, that bridge the gap of information rich and poor. Open access initiatives in terms of scholarly communication all and these developments caused the emerging of open science, particularly to share the research process and outcome of the beginning of research gain scientific inputs in all the corners, and thus find the solution for the earliest possible and to overcome the duplication of research, cost, time, and labour. In this context the present paper aimed at reviewing a few of the major Open science, Open research, Open Data, Open education initiatives and their relevance in the context of the academic research.

## Open Science

Open Science is a "movement which aims to make scientific research, data and dissemination accessible to all levels of an inquiring society". It can be termed

as open scholarships in a broader context which include arts and Social Science Subjects. Open Science opens up new ways in which research/education/innovation are undertaken, archived and curated, and disseminated across the globe. Open Science is not about dogma per se; it is about greater efficiency and productivity, more transparency and a better response to interdisciplinary research needs **[2].**Open science is "the idea that scientific knowledge of all kinds should be openly shared as early as is practical in the discovery process". It is also "The conduction of science in a way that others can collaborate and contribute, where research data, lab notes and other research processes are freely available, with terms that allow reuse, redistribution and reproduction of the research".**[3]**Open science enable the research in higher education institutions not only to know and access timely research outcome of various subject disciplines documented in open platforms, but also enable them to make their science more efficient reliable and responsive to community needs. The European commission emphasized the open science in wholistic and integrated way covering all aspect of research cycle from scientific discovery to its assessment, publication, sharing and outreach. To institute rewards and incentives for researchers in claim to make their research visible and make them in public domain during the national calamities third and pandemic conditions. Open science policy integrated the core work of the researchers time to time towards finding early solution for benefit of the community in terms of repositing the research data, open software and so forth, research outputs will be available prior to publication rather to new publication.

## Open Educational Resources

Open educational resources offer benefits and opportunities for teachers such as use of openly licensed materials, license educator's own open educational resources so others can use it, promotion of teachers' work to a global audience and benefits for students such as provision of supplemental learning materials for courses, making decision what classes to enroll in and be better prepared for classes. Open educational resources provide a great opportunity for "reducing the cost of expanding quality education". Most important benefit of open educational resources is access to educational materials with little or no obstacles very similarly to open access. **[3]**

## Open Access:

Sparcopen **[4]** explains that the Research provides the foundation of modern society. Research leads to breakthroughs, and communicating the results of research is what allows us to turn breakthroughs into better lives-to provide new treatments for disease, to implement solutions for challenges like global warming, and to build entire industries around what were once just ideas.

However, the current system for communicating research is crippled by a centuries old model that hasn't been updated to take advantage of 21st century technology:

1. Governments provide most of the funding for research-hundreds of billions of dollars annually- and public institutions employ a large portion of all researchers.
2. Researchers publish their findings without the expectation of compensation. Unlike other authors, they hand their work over to publishers without payment, in the interest of advancing human knowledge.
3. Through the process of peer review, researchers review each other's work for free.
4. Once published, those that contributed to the research (from taxpayers to the institutions that supported the research itself) have to pay again to access the findings. Though research is produced as a public good, it isn't available to the public who paid for it.

Open Access is the free, immediate, online availability of research articles combined with the rights to use these articles fully in the digital environment. Open Access is the needed modern update for the communication of research that fully utilizes the Internet for what it was originally built to do-accelerate research.

**Open data:**

- Government data with no national security restrictions, Open data is data that can be freely used, re-used and redistributed by anyone, Data which does not contain information about specific individuals. There is No-personal data
- The open data is needed to it is enables accountability, Open data empowers communities, Open data drives economic growth, Open data may lead to more accurate conclusions and better decisions, New knowledge from combined data sources and patterns in large data volumes, Improved or new private products and services, Transparency and democratic control

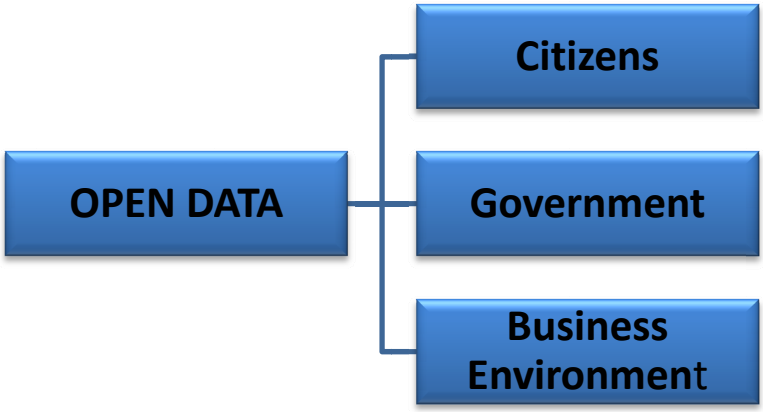



**Figure 1: Use of open data in other Sectors**

**Open Research:**

exeter **[5]** describes Open research comprises openness throughout the research cycle, through collaborative working and sharing and making research methodology, software, code and equipment freely available online, along with instructions for using it. Open research includes making publications freely available online (open access), in addition to the underlying research data (open data).

Licences such as Creative Commons applied to open access publications and data allow maximum reuse, subject to proper attribution to the author of the work. The data and publications can be interrogated, reused, built upon and adapted, leading to new research findings, development and innovation.

**Relevance in Higher Academic Research:**

Higher academic organizations normally have a financial crunch while compare to industrial and corporates established the concept of the open science, open research, open data has been advocated as like the open access movement started emigrating from the middle of the millennium to give access to scholarly publications as the outcome to the researchers, faculty members, scientist, higher education institutions. More than a decade scholarly open access completely changed the dimension of the research and enables the stakeholder to know the recent happening immediately in the scientific research, and thus, bridge the gap among the academics from east to west.

The present system of sharing the research data, research process, objects, the protocols, results enable to regulate and update their research, which in term reduce the economical and intellectual imbalance. Early career researchers,

particularly find global opportunities to receive enough funding and access and sharing of best practices. Replication of research results enable to find and overcome the limitation with transparency. Enable the student and faculty members in universities and higher economic institution to have visibility, enhanced citation behavior and the citation metrics advantages. The practice of making available the supporting dataset of the research data used in the publication. Use of digital object identifier and author identity enables for easy retrieval interoperability and change of research data. Decision support for finding funding agencies and availing research grants. Ensuring the intellectual property by making the research open with standard Meta data in international portals.

## Initiatives

## Major Open Data Providers: An overview

### Data.gov: https://www.data.gov/

This is a kind of open data website which consists about Agriculture, Climate, Energy, Local Government, Maritime, and Ocean Adult Health. Resources.data.gov this page is an online repository of policies, tools, case studies, and other resources to support data governance, management, exchange, and use throughout the federal government and Federal Data Strategy Data, accountability, and transparency used to creating a data strategy and infrastructure for the future and it gives data about Rivers of Data – Inland Electronic Navigation Charts. There are 300, 256 datasets were in this particular website which is used to Publics and Researchers and various department were collaborated in this open data "DATA.GOV" website dashboard.

### Kaggle Datasets: https://www.kaggle.com/datasets

Kaggle allows users to locate and publish data sets (92,303 Datasets) tasks (3,392 Datasets) computer science (4930 Datasets) education (3371 Datasets) classification (1763 Datasets) computer vision (847 Datasets) Neuro-linguistic programming (1270Datasets) and Data Visualization (873 Datasets) explore and build models in a web-based data-science environment, work with additional data scientists and machine learning engineers, and enter competitions to explain data science challenges. Codes and many free courses like Python, Intro to Machine Learning, Intermediate Machine Learning, Pandas, Data Visualization were also available in this website.

### World Bank Open Data: https://data.worldbank.org/

World Bank Open Data is a Free and open access to global development data which since in 1947, the World Bank has funded over 12,000 development

projects, traditional loans, interest-free credits, and grants. There are 189 member countries, staff from more than 170 countries, and offices in more than 130 in locations, the World Bank Group is a unique global partnership: five institutions working for sustainable solutions, it is used to reduce poverty and build shared prosperity in developing countries. In this website they digitalize the records by the classification of The Archives Catalog, Projects and Operations, Photo Catalog, Oral History, Documents & Reports, Web Archives which is used to know the past and present plan and scheme. To reduce public poverty this website helps to develop the environment with new ideas of many subjects like Agriculture and Food, Climate Change, Competitiveness, Digital Development, Debts, Disaster risk Management, Education, Energy, Environment, Extractive Industries, Financial Inclusion, Financial Sector, Job and Development, Nutrition, Poverty, Regional Integration and so on. They were providing Open Knowledge Repository page which is obtained 32,334 Publications.

**SPARC Open Data: https://sparcopen.org/open-data/**

SPARC is Sharing knowledge is a fundamental human right. It is a global advocacy organization working to make research and education open and equitable by design for everyone. SPARC's over 240 North American members symbolize eight Canadian provinces as well as 49 of the United States and the District of Columbia. The membership includes several institutions from outside North America and affiliate memberships of four major library associations. In addition to SPARC's three global affiliates (SPARC Europe, SPARC Japan, and SPARC Africa), this broad and comprehensive illustration from libraries helps reinforce the coalition's international focus. It depicts $17 Millions were financial support provided by US Congress for open textbooks. 160 Millions of views of Covid- Related Articles in Pubmed Central.

**Stanford Large Network Dataset Collection: https://snap.stanford.edu/data/**

It is used to know about Social networks , Networks with ground-truth communities ,Communication networks , Citation networks , Collaboration networks ,Web graphs , Amazon networks , Internet networks, Road networks, Autonomous systems , Location-based online social networks , Wikipedia networks, articles, and metadata , Temporal networks , Twitter and Memetracker , Online communities , Online reviews , User actions , Face-to-face communication networks , Graph classification datasets this kind of datasets used to researchers and new Learner about Networking Tools. In This

Site Data Classified Into Five Types Which Are Name, Type, Nodes, Edges, Description. Open research positions in SNAP collection are accessible by undergraduate, graduate and postdoctoral levels.

**Open science design (NASEM): https://www.nationalacademies.org/**

The National Academies of Sciences, Engineering, and Medicine are private, nonprofit institutions that provide expert advice on some of the most critical challenges facing the nation and world. The National Academies of Sciences, Engineering, and Medicine are the nation's pre-eminent source of high-quality, objective advice on science, engineering, and health matters. This site peer-reviewed reports present the evidence-based consensus of committees of experts. Published proceedings record the presentations and discussions that take place at hundreds of conferences, workshops, symposia, forums, roundtables, and other gatherings every year. And, our prestigious journals publish the latest scientific findings on a wide range of topics. The National Academy of Sciences (NAS) is recognizes the outstanding science through election to membership; publication in its journal, PNAS; and its awards, programs, and special activities. Through the National Academies of Sciences, Engineering, and Medicine, the NAS provides objective, science-based advice on critical issues affecting the nation.

**EOSC- European open science cloud: https://www.eosc-portal.eu/**

The EOSC Portal is a doorway to information and resources in EOSC, given that updates on its governance and players, the projects contributing to its realization, funding opportunities for EOSC stakeholders, relevant European and national policies, important documents, and recent developments. The EOSC Portal Catalogue & Marketplace acts as an entry point to the multitude of services and resources for researchers. This portal firstly describe about EOSC's Portal, Projects, Glossary, Association, Governance, Enhance, Doers. And Services & Resources are covered Access physical & infrastructures, Aggregators & Integrators, Processing & Analysis, Security & Operations, Sharing & Discovery, and Training & Support. Their polices were EU+ Countries, European Union and elaborated the use cases Community Use Cases, Submit Use Case, Industry Use Cases, Forthcoming Events, Past Events and documents were European Commission, Community Member, States. There are 299 resources were in this portal. Scientific domains were Medical & Health Sciences, Engineering & Technology, Natural Sciences, Generic, Humanities, Agricultural Sciences, Social Sciences data were provided in this portal.

**Data.gov.uk https://data.gov.uk/ –**It was launched in closed beta in September 2009 and publicly launched in January 2010. As the February 2015 it contained over 19,343 datasets, rising to over 40,000 in 2017. Similar to the data.gov's source for U.S. data, there is also one for the entire United Kingdom. Reports include data on everything from crime and justice to defense and government spending. This portal covers different kind of subjects and datasets Business and economy (977 Datasets), Crime and justice (635 Datasets), Defense(188), Education (1,125), Government (2,436), Environment (6,930), Government spending (1,801), Health (1,819), Mapping (2,621), Society (2,377), Towns and cities (6,328), Transport (872), Digital service performance (3), Government reference data (1). Anyone can publish their data and mange it and documentation in this portal.

**UK Data Service https://www.ukdataservice.ac.uk/** – The UK Data Service provides access to the UK's largest collection of social, economic and inhabitant's data. A perfect set off to data.gov.uk is the UK Data Service; a search engine for recent datasets on social media trends, politics, finance, international relations, and additional happening in the United Kingdom, The UK Data Service collection reflects the issues that affect all our lives and experiences, from birth through education, employment, our social interaction and on to old age. This site collection includes major UK government-sponsored surveys, cross-national surveys, longitudinal studies, UK census data, international aggregate, business data, and qualitative data. There are some method to get data from the Key data, Data by theme, Data by geography, Open data, How to access, Other providers, Explore online, Data access policy, Thesauri. This portal provides how to use data Advice and training Guides, Video tutorials, Data in use, Citing data, Secure Lab, Teaching with data, Student resources, Data Skills Modules, Secondary analysis and also it guides managing data and depositing the data.

**Data Gov (India) https://data.gov.in/**

Open Government Data (OGD) Platform India - data.gov.in - is a platform for supporting Open Data initiative of Government of India. The portal is intended to be used by Government of India Ministries/ Departments their organizations to publish datasets, documents, services, tools and applications collected by them for public use. It intends to increase transparency in the functioning of Government and also open avenues for many more innovative uses of Government Data to give different perspective. It categories datasets Resources (505,959), Catalogs (10,487), Departments (178), Times Viewed (30.21 Million), Times Downloaded (8.76 Million), Chief Data Officers (353), APIs

(100,171) Visualizations (2,369). The indicator dashboard is Drinking water and Sanitation, Health, Transport, Labour and Employment, Economy, Education, industries, Demograpy.

**European Union Open Data Portal** https://data.europa.eu/en this open data portal has almost 14,000 datasets available, EUROPA is one of the top open data providers in the EU for insights on Energy, Education, Commerce, Agriculture, International Issues. This site holds EU Data, International Data, Country Data and catalogues were GDE-DE (346 825), Geoportal Czech Office for Surveying, Mapping and Cadastre (200 779), Geocatalogue France (167 405), Czech National Open Data Portal (136 150), data.gov.uk (50 892), GovData (48 600), datos.gob.es (47023) AND So On. The different Categories were holds as open data they are Agriculture, fisheries, forestry and food (232 724), Environment (133 726) Government and public sector (67 282), Justice, legal system and public safety (191 904), Science and technology (76 064) and there are 100+ keywords, three metadata quality to assess the data and it obtains 50 + different file formats. It holds Open Data Maturity it studies about clusters countries into four different groups: trend-setters, fast-trackers, followers, and beginners, from the most mature to the least.

**Open Data Network** https://www.opendatanetwork.com/ – This source allows users to look for data using a robust search engine. Apply advanced filters to your searches, and pull data on everything from public safety, finance, infrastructure, housing and development. This open data holds a data about Finance, Infrastructure, Environment, Demographics, Transportation, Public Safety, Economy, Education, Health, Social Services, Housing & Development, Recreation, and Politics each subject have above 10,000 results. There are some geographical areas were mingled in this open data service.

**UNICEF** https://www.unicef.org/ – These valuable open datasets monitor and report on the situations of children and women from all places. In this site the Latest updates on disease outbreaks, gender and education, attitudes on social norms, and other datasets are widely available through UNICEF, as well as data visualizations. UNICEF's Data & Analytics (D&A) team is the global go-to for data on children. It used to create collection, validation, analysis, use and communication of the most statistically sound, internationally comparable data on the situation of children and women around the world. D&A upholds the quality, integrity and organization of these data and makes them accessible as a global public good on the data.unicef.org website. The team generates data-driven thought products, ranging from short brochures to in-depth analyses like major reports, that inform UNICEF's evidence-based programme strategy and

advocacy and help identify emerging areas where children are in need. They also detail important progress in actions to support children. In parallel, the team's work arms governments, other UN agencies, international NGOs, think tanks and academics, media and individuals with the necessary insight to timely action to improve the lives of women and children. Many countries were collaborated with many datasets in this site about Covid-19 And Children, Adolescents, Child Disability, Child & Adolescent Health, Child Migration, Child Mortality, Child Nutrition, Child Protection, Child Poverty, Climate Change, Early Childhood Development, Education, Gender Equality, Hiv/Aids,Maternal And Newborn Health, Water And Sanitation

**Food and Drug Administration** **https://www.fda.gov/food** – It is commonly known as the FDA, this is open data source serves as a learning library on all from food borne poor health and contaminants to dietary supplement news and recalls in the U.S. The product details were provided by FDA is Food, Drugs, Medical Devices, Radiation-Emitting Products, Vaccines, Blood, and Biologics, Animal and Veterinary, Cosmetics, Tobacco Products. This Information is used for Consumers, Patients, Industry, Health Professionals, Federal, State and Local Officials. In this website the facilities were provide (Browse Guidance Documents by Topic, FDA Guidance Documents, Commenting on Guidance Documents, Report on Good Guidance Practices)

**HealthData.gov** **https://healthdata.gov/** – it is containing over 3,000 datasets over a 125+ year span, this open data source is devoted to making high-value data easily reached to entrepreneurs, researchers, and policymakers.this open data is classified into three parts which will easy to access first one is Recent Datasets, blog and HHS Protect Public Data Hub, there is some catagories like Blog Community, Health, Hospital, Inpatient, Medicare, National, Quality, State. So this site is dedicated to manufacture high importance health data more handy to entrepreneurs, researchers, and policy makers in the hopes of better health outcomes for all

**National Center for Education Statistics** **https://nces.ed.gov/** – The National Center for Education Statistics (NCES) is the primary central entity for collecting and analyzing data connected to education in the U.S. and other nations. NCES is situated within the U.S. Department of Education and the Institute of Education Sciences. NCES fulfills a Congressional authorization to collect, collate, analyze, and report whole statistics on the condition of American education; conduct and publish reports; and review and report on education activities internationally. This data is divided into five parts statistical standards and data confidentiality staff, annual reports and information staff,

Assessments Division, Sample Surveys Division, Administrative Division and these each one is divided into different branches, which is useful to researchers and new learners about statistics. Other publication resources are Education Resources Information Center (ERIC), Federal Depository Libraries, Government Printing Office (GPO), Ordering NCES Products.

**Climate Data Online** https://www.ncdc.noaa.gov/ – NOAA's former three data centers have merged into the National Centers for Environmental Information (NCEI). The National Climatic Data Center, the National Geophysical Data Center, and the National Oceanographic Data Center, which includes the National Coastal Data Development Center—have merged into the National Centers for Environmental Information (NCEI). It is one of the most major archives on Earth, with comprehensive oceanic, atmospheric, and geophysical data. as of the depths of the ocean to the surface of the sun and from Million-Year-Old Ice Core records to close to real-time satellite images. There is extreme event and dynamically generated climate information Climate of the United States, Analyses, Extreme Events, Statistical Weather and Climate Information, Regional, Sectoral, International, Science Papers and Publications. NCEI is the world's biggest provider of weather conditions and climate data. Land-based, marine, model, radar, weather balloon, satellite, and paleo climatic are just a small number of of the types of datasets accessible.

**National Center for Environmental Health** https://www.cdc.gov/nceh/data.htm – This Website provides a reference list of nationally funded data systems that have a relationship to environmental public health. the main Activities of National Center for Environmental Health is Public health surveillance, Applied research (Epidemiologic studies, Laboratory analyses, Statistical analyses, Behavioral interventions, Operations and systems research), Communication and education, Standards, guidelines, and recommendations, Environmental public health emergency training and technical support to officials of state, local, and tribal environmental health agencies. The partners of NCEH is State, local, and tribal health departments, Federal, state, and local health and environmental agencies, Philanthropic foundations, Industry and labor groups, Professional, voluntary, and community organizations, Managed care organizations, Foreign governments, International health organizations. The health data were differentiated into three categories there are National Center for Environmental Health (NCEH) and Centers for Disease Control and Prevention (CDC) and U.S. Department of Labor, Bureau of Labor Statistics. This site is usefull to public and researcher to view and use the open data.

**IEA Atlas of Energy** http://energyatlas.iea.org/ – The IEA Energy Atlas is published by the International Energy Agency, one of the world references in terms of energy statistics. The IEA Energy Atlas was first released in February 2015. The Atlas complements the country data, the animated Sankey flow energy balance, the databases and the publications available on the statistics page of the IEA website. It is global energy and electricity consumption rates; IEA has comprised open datasets and atlas visualizations for every citizen to access. The IEA Energy Atlas is published by the International Energy Agency, one of the world references in terms of energy statistics. The Atlas complements the country data, the animated Sankey flow energy balance, the databases and the publications available on the statistics page of the IEA website. There are various topics were covered Coal have six datasets (Coal Production, coal net import, coal consumption, total final consumption and share of coal in electricity), Electricity, Energy Balance, Natural Gas, Oil, Renewables, CO2 Emissions from fuel combustion.

## Conclusion:

Essential Research Indicators, Impact Assessment, Citation Analytics and Research Visibility will gaining momentum create the public availability of research outcome in digital version of scholarly communication and information younger generation of contemporary research community prefer to have the accession sharing of research data timely and incrementally is enable integrated research collaboration at Local, National and International Level exposure to the scholarly open access initiatives, particularly the archives that stores research data, protocols and objective have had greater role open science is a complex process while the very purpose is sociological which enable the scientific, knowledge output as a product of society with social collaboration that also enhanced the economic benefits as a whole.

## Footnotes

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# A Psychological Perspective of Open Access

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## ABSTRACT

*Open access offers access to freely available literature, including scholarly and other public resources globally. Information access and information consumption are psychological processes of the pattern of information use of individuals. This study orients to trace the footprints of psychological approaches in the Open Access ambience. Furthermore, this study focuses on the theoretical framework of Open access from the psychological point-of-view, including cognitive, Behavioural, and Humanistic approaches. It appears that the result is affirmative enough in respect to the relation between Open Access and Psychology, where mass psychology plays its role in longitudinal ways, and individual psychology manifests its role in behavioural ways.*

**KEYWORDS:** *Open Access, Psychology, Cognitive Approach, Behavioral Approach, Humanistic Approach*

## INTRODUCTION:

Information plays a crucial component in the transformation of society. Accessibility of resources may be considered a fundamental social right of every individual in a society. Open Access (OA) is one of the most remarkable initiatives to fulfil individual information access rights. OA provides access to freely available literature, both scholarly and common resources worldwide. From the psychological standpoint, Open Access developments raise new challenges like ***cognitive biases***, ***behavioural approaches towards information*** and ***humanistic approaches to information***. Information generation, information consumption is primarily a psychological process and thus can be regarded as a fundamental component of all information development and its assimilation into society.

Psychology being the scientific study of **social characteristics** and **cognitive processes**, any observable activity or reaction of an individual in society can be referred to as **social characteristics**. In contrast, all aspects of mental activity can be called **cognitive processes**[1]. The study tries to explain theoretical aspects of OA from a psychological contexture for a holistic understanding of OA.

While addressing the theoretical and philosophical perspectives of OA, the obvious questions that seem mandatory for establishing the relationship between OA and social psychology are a) is there any psychological orientation/bias in OA? If so, how can it be manifested? b). How do cognitive, behavioural, and humanistic approaches play a role in OA philosophy? and c). Which of these three approaches has the most influence on OA philosophy?

This study is prone to resolve issues raised above and thus leaned to dig into the core. It focused on a) to identify psychological orientation/bias in OA. b) to understand cognitive, behavioural, and humanistic approaches in OA philosophy. c) To evaluate these three approaches for identifying the most influential aspects in OA philosophy.

Psychological theories are **systems of ideas that can explain certain aspects of human thoughts, behaviors, and emotions**. Psychology researchers create these theories to make predictions for future human behaviors or events that may take place if certain behaviors exist[2]. It is evident form the literature that OA philosophy primarily embeds the three basic approaches of psychology. Prime objective of this paper is to delineate which approach of psychology enhances proper philosophical perspectives of OA and the reasons implicit into it. This study helps to identify OA consumption and adoption of information. The study will also help trace the footprints of psychological approaches in information access by an individual in a social structure, like the Technology Acceptance Model (TAM)[3], Diffusion of Innuvation[4]and the Unified Theory of Acceptance and Use of Technology (UTAUT)[5].

## OPENNESS AND OPEN ACCESS:

Open access refers to the availability of free online scholarly articles with re-use rights. American Psychology Association (APA) describes, "The goal of open access is to move countries toward becoming 'knowledge societies' in which information, science, and communication are easy to come by and are highly valued[6]." Openness in OA is a crucial and ever-changing concept. Gasparotto (2019)[7] mentioned that "open paradigm" is, therefore, a pre-condition of access, so they are used interchangeably. Openness brings social and psychological changes in society. Openness is considered in today's world as a social construct, much

required in the process of citizen empowerment. The notion of openness brings change in the society, provides sustainable solutions for bridging knowledge and digital divides in the society[8]. It considers the availability of information and the transparency of any activity that contributes to the formation of social structures[9]. Openness develops the intellectual curiosity of an individual and thus harnesses creative and rational justice to information. In OA, openness is bridging the knowledge gap for global perspectives. The availability of resources is critical in protecting the primary information rights globally from commercial publishing. Individuals who have access to various resources can be more imaginative, generate new ideas, and gain new experiences. Openness is seen increasingly as a concept and practice that connects well with neoliberal needs and rhetoric, and that can be related to ideas of transparency and efficiency promoted by business and government[10].The term openness is interlinked various concepts with OA such as Open-source software, Open education resources, open data, etc.

Project Gutenberg is considered the beginning of OA in the 1960s. Afterwards, several steps were taken in the direction of the OA movement. The main three public statements in the 2000s change the entire scenario of OA movements. First, Budapest Open Access Initiatives (BOAI) was the first initiative to use the term "open access" released on 14th February 2002 by Open Society Institute. Second, Bethesda Statement on Open Access Publishing released a statement on 20th June 2003 for open access publication of scholarly literature. Last, Berlin Declaration on Open Access to Knowledge in the Sciences and Humanities was held on 22-23 October 2003 in Berlin by Max Planck Society to support access to knowledge, and it also added to established one online repository in their statement[11].



**Philosophical Perspective of Open Access:** The Philosophical contexture of OA provides the foundation of OA. Helene Brinken (2021)[12] portrayed ten philosophical premiseson Open Access that are pivotal for understanding psychological contribution in Open Access initiatives. In the age of digital publishing, information generation and information demand have reciprocal relationship. The prime aim of OA is to disseminate the scholarly literature freely worldwide. OA provides two possibilities for knowledge dissemination, either published in open access journals (Gold OA) or deposited in open access repositories (Green OA)[13]. Open and free access of knowledge via the OA platform within the socio-psychological context extends opportunities for everyone in the academic fraternity like researchers, authors, librarians and other stakeholders.

## PSYCHOLOGICAL ASPECTS:

There is no existence of individuals without a society. Everyone is connected and influenced by the other with social ties and bonds as stated by Robert Putnam[14]. In this context, social psychology has a significant impact on how people think, feel, and share information for their own as well as societal development[15]. Social psychology is the combination of two concepts: society and psychology. It is evident that OAI (Open Access Initiatives) have a social bias, and the psychological perspective is mostly unuttered. Open Access Initiative has the psychology of ownness that imbibes collaboration, participation, and social agglomeration. The construct of psychological approaches in Open Access initiatives may be categorized as:

**Cognitive approach and OA:** Cognition is a mental ability of an individual to perceive, store and interpret information to be acquired from the environment. The cognitive process assists in using previously stored knowledge and creating new knowledge. People conglomerate information through several steps, store it in memory, and infer with proper justification as an aspect of the cognitive process[16]. It is an individualistic process of acquiring new knowledge. Open Access allows individuals to boost up their cognitive process through germane knowledge and engage in creative writing. The restriction to access the information develops frustration and generates psychological deterrents among the researchers. Open Access breaks the barrier of knowledge and provides hospitality of information without any restriction[17].

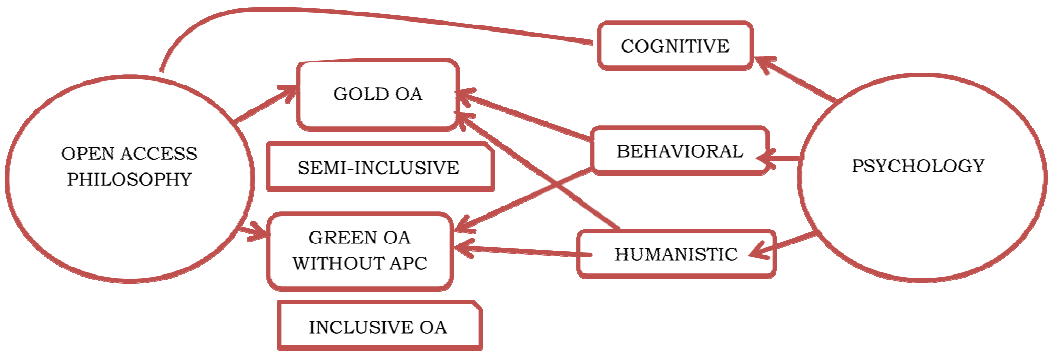
**Behavioral approach and OA:** Human behavior comprises various elements like personality, attitudes, perceived norms, and perceived behavioral control. Open Access is a widely adopted and acknowledged initiative among academics[18]. Every individual saliently accepts new technology to develop an attitude towards new knowledge compendiums including OA publishing. Koster

and others (2021)[19] mentioned the domain of open-access publishing offers a pragmatic path that helps to develop concrete intervention strategies for tackling publishing behavior that may in the long run also contribute to a wider change in the research culture and research behaviour.

**Humanistic approach and OA:** The humanistic approach concerns human values and encourages each other in a society. OA allows high visibility of research work that motivates the researchers towards open knowledge. OA motivates authors to publish their work in the OA platform for high impact. National and international organizations collaborate to create peripheral and core open-access publishing network for researchers, students, librarians, and others[20]. Hence the OA concept is inclined to humanistic approach by enhancing support to access scholarly literature without any restriction.

## DISCUSSION:

The study identified the term '***inclusive OA'*** as green OA and '***semi-inclusive OA'*** as gold OA based on the satisfaction of psychological approaches.




The concept of open access is growing rapidly and is popular among researchers. Green and gold OA encourage researchers to publish their papers in digital environments. But both OA system influence researchers differently and affects their intention in OA publishing. The study lies with the direct philosophy of OA which was mooted by the British Philosophical Association[21] which in 2018 came out in favor of green OA against Gold OA with APC (Article Processing Charge). This leads to satisfying all three approaches of psychology i.e., Cognitive, Behavioral, and Humanistic. We, the authors vouch for the term '***inclusive OA'*** as green OA is significant for promoting the true objectives of OA, while the Gold OA is '***semi-inclusive OA'*** as it partially addresses psychological approaches. The

cognitive process includes the entire OA concept, in which knowledge is generated and disseminated globally. Behavioral and humanistic approaches rely on publishers' policies for publishing digital contents. OA extends the inquest of query building among the researchers.

## CONCLUSION:

Information consumption and dissemination are the prime movers in developing a knowledge society. OA is a subset of recorded knowledge, and it is a continuum in the total scenario of digital publishing. The study found that the psychological approaches have a significant role in OA initiatives. Every individual is an agent of a social strata and accepts new technologies with time. The cognitive approach is more personal for the researchers, according to the study, whereas behavioral and humanistic approaches triggers the usage of published literature.

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# Open Access Resources and Information Services in The Agriculture Sector: Covid-19 An Opportunity.

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## ABSTRACT

*This paper provides links to key resources and search tools for open access (OA) literature which are useful to national and international agricultural researchers. And gives much better strength and confidence to researchers and they feel like a guide or a Library in hand in during the time of COVID-19 period. Open sources are playing a key role in Education, Extension and Research in pandemic times. This work describes the meaning and definition of open access and initiatives taken to develop open access sources. Lists open access resources, with their URL Address, cover all the subjects but provide details only for agriculture and allied sciences such as Fishery, veterinary, animal, biological sciences, etc. Some of these resources like AgNIC, AgEcon Search,AgriFor, PubMed Central, AgZines, AGORA, AGRIS, AgriXiv, AGRICOLA, PubAg, TEEAL, are developed and maintained, and promoted by libraries such as National Agricultural Library, Magrath Library, University of Nottingham Greenfield Medical Library and National Library of Medicine. Discusses the use of open access resources by the libraries in the context of rising prices of the reading material.*

## INTRODUCTION

The concept of open access, which was limited to library users only, has been becoming popular on the Internet. Now the libraries have become boundary-less with the application of information technology and the users can access any information at any time from anywhere. With the advancement of new technologies now this concept has widened its horizon covering a wide range of areas, users, and information. Open access sources are available in almost all the fields and libraries can make use of these in providing access through the Internet to get the latest information and thus making their services effective. These open access services not only include books, encyclopedias, dictionaries, etc. but also the latest articles from the journals. In addition to the latest articles, access can also be provided to

back volumes of the journals. The authors of this article are working in the agricultural library, therefore, they restricted their open access sources available field of agriculture and allied fields Animal Sciences, Veterinary Sciences, Sciences applied to agriculture.

# OPEN ACCESS

Open Access (OA) started in 2000, It is a relatively new publication model in the long history of scientific journals. In recent years there has been vast growth in the number of articles published open access, the number of fully open access journals, subscription titles offering OA options and funder mandates. Open access refers to freely available, digital, online information. Open access scholarly literature is free of charge and often carries less restrictive copyright and licensing barriers than traditionally published works, for both the users and the authors. While OA is a newer form of scholarly publishing, many OA journals comply with well-established peer-review processes and maintain high publishing standards.

## Open Access Policies and Documents:

Open access policies, statements and resolutions from a number of organizations and institutions

### Berlin Declaration on Open Access to Knowledge in the Sciences and Humanities

The Berlin Declaration on Open Access to Knowledge in the Sciences and Humanities of 22 October 2003 is one of the milestones of the Open Access movement.

### Bethesda Statement on Open Access Publishing

This 2003 statement drafted by the biomedical research community defines open access and supports open access publishing.

### Budapest Open Access Initiative

This 2001 initiative launched by the Open Society Institute established a foundation of open access principles relating to research literature.

### Sherpa Juliet funder open access policy database

This searchable database provides information about the open access publishing and archiving policies of many key funding agencies.

### Sherpa Romeo publisher open access policy database

This searchable database provides information about the open access publishing and archiving policies of publishers and individual journals.

### World Bank Open Access Policy

The World Bank recognizes an open access policy for its published documents and reports.

## OPEN ACCESS RESOURCES:

Though there are so many national and international web portals for open access literature in the field of agriculture and allied sector.

### AGORA: Access to Global Online Research in Agriculture

It is Access to Global Online Research in Agriculture and maintained by Food and Agriculture Organization of the UN (FAO)The program which "enables developing countries to gain access to an outstanding digital library collection in the fields of food, agriculture, environmental science and related social sciences. AGORA provides a collection of up to 6,500 key journals and up to 22,000 books to more than 3,000 institutions in more than 115 countries. AGORA is designed to enhance the scholarship of the many thousands of students, faculty and researchers in agriculture and life sciences in the developing world."(**https://agora.research4life.org**)

### AGRIS: International System for Agricultural Science and Technology

International, multilingual database of papers, data, and statistics on agricultural research and technology produced by the U.N. Food and Agriculture Organization (FAO).Particularly investing in covering beyond peer-reviewed literature including gray literature "including unpublished scientific and technical reports, theses, dissertations and conference papers in the area of food and agriculture." **(http://agris.fao.org)**

### AGRICOLA: AGRICultural OnLine Access

AGRICOLA is "the public catalogue of the United States Department of Agriculture National Agricultural Library, It is administrated by National Agricultural Library (NAL), This free access version of the AGRICOLA bibliographic database "consists of two subsets of records. The first contains citations for journal articles that include abstracts. The second consists of bibliographic records describing monographs, serials, audio-visual materials and online content from around the world. AGRICOLA includes but is not limited to

resources available in the library. The database contains 5,200,000+ records and includes printed works from as far back as the 15th century.

AGRICOLA records describe publications and resources encompassing all aspects of agriculture and allied disciplines, including animal and veterinary sciences, entomology, plant sciences, forestry, aquaculture and fisheries, farming and farming systems, agricultural economics, extension and education, food and human nutrition, and earth and environmental sciences."**(https://agricola.nal.usda.gov)**

**PubAg:**

It is created by the United States Department of Agriculture National Agricultural Library (NAL), PubAg "contains full-text articles relevant to the agricultural sciences, along with citations to peer-reviewed journal articles with links to publisher sites and elsewhere for full-text access. PubAg's citations have been enriched through subject analysis and application of terms from NALT (NAL's Agricultural Thesaurus)." PubAg subject coverage includes "nutrition, food safety, food quality, animal and crop production and protection, natural resources, sustainable agricultural systems, rural development, agricultural economic and policy issues, agricultural imports and exports, agricultural statistics, extramural research, and Extension education."

How does PubAg differ from AGRICOLA? AGRICOLA is "the public catalogue of the National Agricultural Library. It contains records for all of the holdings of the Library. It also contains citations to articles, much like PubAg. AGRICOLA also contains citations to many items that, while valuable and relevant to the agricultural sciences, are not peer-reviewed journal articles. Also, AGRICOLA has a different interface. So, while there is some overlap between the two resources, they are different in significant ways. There are no plans to eliminate AGRICOLA."**(https://pubag.nal.usda.gov/)**

**AgEcon Search: Research in Agricultural and Applied Economics**

It is developed and maintained by the Department of Applied Economics and the University Libraries at the University of Minnesota. AgEcon Search "collects, indexes, and electronically distributes full-text copies of scholarly research in the broadly defined field of agricultural and applied economics including sub-disciplines such as agribusiness, food security and supply, energy and natural resource economics, environmental economics, policy issues, international trade, and economic development. Content includes conference presentations, working papers, journal articles, government documents, and theses and dissertations."**(https://ageconsearch.umn.edu)**

### AgNIC: Agriculture Network Information Collaborative

It is administrated by various North American and some South American coordinating universities/libraries AgNIC is a "voluntary alliance of members based on the concept of "centers of excellence". The member institutions are dedicated to enhancing collective information and services among the members and their partners for all those seeking agricultural information over the Internet." This collaborative includes "over 60 topics covered comprehensively by partner institutions with full-text and web-based resources." AgNIC " facilitates and participates in partnerships and cooperation among institutions and organizations world-wide that are committed to the identification, delivery and preservation of reliable, freely-available, evaluated, digital content and quality services for agriculture, food, and natural resources information."**(https://www.agnic.org)**

### AgriXiv:

Developed by CAB International. International archive of preprints for agriculture and allied sciences. (**https://agrixiv.org**)

### DOAJ: Directory of Open Access Journals

It is maintained by Lund University, Sweden, the DOAJ "was launched in 2003 at Lund University, Sweden, with 300 open access journals and today contains ca. 9000 open access journals covering all areas of science, technology, medicine, social science and humanities." This directory is a "community-curated list of open access journals and aims to be the starting point for all information searches for quality, peer-reviewed open access material."

### DOAB: Directory of Open Access Books

It is developed by DOAB Foundation, National Library in the Hague. The primary aim of DOAB is to increase the discoverability of open access books. Academic publishers are invited to provide metadata of their open access books to DOAB. DOAB is an open infrastructure committed to open science. The directory is open to all publishers who publish academic, peer-reviewed books in open access and should contain as many books as possible, provided that these publications are in open access and meet academic standards."

## CONCLUSION

Open Access literature plays a key role in the COVID-19 Pandemic situation, in all subject fields, and may be nonstop research work is done because of the only Open Access system. Day to day increases the cost of printed books, Journals,

Magazines, this is a very hard situation for education and research institutions. In this context, everyone depends on the open access system.

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# Role of Libraries in Promoting Open Access during the Pandemic Era

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## Abstract

*The Covid-19 pandemic had a terrible influence on the global economy, education, enterprises, health, and employment, among other things. To survive the epidemic and minimise losses, most businesses and educational institutions went virtual and used technology to provide online services. This study explains how Tamil Nadu Academic Libraries dealt with the crisis and what services, assistance, and collections they provided. This freedom, according to the study, is a fundamental human right that must not be curtailed and, on the contrary, must be supported even in times of emergency or pandemic.*

**Keywords***: Covid-19, Tamil Nadu Academic Libraries, Don Bosco College (Co-Ed) Arivagam – Library, pandemic, public libraries, virtual services. NDLI, N-LIST, D-Space, Ceetle, etc.,*

## Introduction:

Covid-19 is an infectious disease caused by a newly identified corona virus, according to the World Health Organization (World Health Organization, 2020). The pandemic's spread across continents and global breakout made it catastrophic, affecting healthcare systems, societies, businesses, education, and economics. Thousands of individuals infected, job losses, business closures, and a lockdown of schools and universities followed by a transition to online learning made the pandemic one of the worst in history, with over one million deaths reported worldwide. The American Library Association (ALA) has compiled a detailed handbook, best practises, and protocols for librarians to refer to on a global basis; the ALA Covid-19 recovery centre contains instructions for reopening libraries by state (ALA, 2020a). The International Federation of Library Associations and Institutions (IFLA) has created vital resources that address major concerns that all libraries face (remote services, hygiene, materials handling, remaining at home, closing or reopening, and so on). In the Covid-19 era, it became the standard to

consult before making changes to protocols. Major publishers and e-resources providers reacted quickly to the pandemic and backed librarians in their goal to give clients with uninterrupted and dependable information services. All Tamil Nadu Academic Libraries have closed all facilities and converted to a virtual services model in order to keep our communities safe and follow university corona virus (COVID-19) guidelines. All Tamil Nadu Academic Libraries have closed their doors and switched to a virtual services paradigm until further notice. The majority of library services are offered remotely, and our substantial collection of digital items is still available. Libraries all across the world are grappling with difficult decisions about which services to provide and how to do so, with options ranging from minimal limits to complete shutdown. Libraries in many regions of the world are in a variety of conditions, ranging from providing a full service to completely closing down. During this period, the Tamil Nadu Academic Libraries are committed to assisting students and faculty. The Library is providing limited face-to-face assistance to ensure the health and safety of both employees and users.

## Libraries in Covid-19 times

In Tamil Nadu, the major academic and public libraries followed the safety protocols and operated electronically via their websites. The borrowing of books was expanded, and users were kept up to date on academic and governmental decisions, particularly with the lifting of the lockdown and the gradual reopening in accordance with the State of Tamil Nadu's four-phase plan.

## Measures:

- Implementing quarantine policies on returned books
- Implementing plans to offer remote services, such as e-learing, e-Learning, or support for remote teaching
- Developing click-and-collect or drive-through services to allow access to books without human contact
- Developing protocols for how to respond if someone with symptoms is identified in the library
- Implementing regular cleaning operations (including brief library closures), focusing on surfaces where the virus appears to be able to survive the longest (plastics, metals other than copper), or at the very least intensifying clearning
- Creating click-and-collect or drive-through services to allow access to books without having to interact with people

- Creating protocols on how to respond if someone with symptoms is recognised in the library

## Initiatives Taken in Response to COVID-19

During COVID 19, the library has given a one-stop solution by putting all the useful resources under one header, namely library services, to improve the visibility of the resources and to make information searching easier.

## Remote Access to E-resources

The main goal of any academic library is to improve and strengthen the teaching, learning, and research process by implementing a seamless document/information delivery system, and libraries in the higher education system across the country have been working hard to provide services and access to collections to users who have been displaced as a result of COVID-19. While all of the libraries studied offer remote access to subscription e resources, many have gone to great lengths to leverage and enhance their existing online offerings. Notably, the library has provided a step-by-step user guide for logging in remotely to access licenced E-resources.

## Free and Expanded Access

For a limited time during this epidemic, some publishers are providing increased access to e resources (access to more items than those subscribed by the library), such as e-books, e-journals, e-databases, and so on. To make these free and extended resources more visible to users, libraries have highlighted the links to these resources on their portal. This has increased the likelihood of customers using virtual services and, as a result, frequent visits to the library portal.

## Open Access Resources

Aside from that, there are numerous scholarly materials that are publicly available.

## Resources related to COVID-19

The terms and conditions under which licenced electronic materials are procured govern access to them. As scientists around the world race against the clock to produce a definitive therapy for the disease, access to as much and as rapidly as possible published literature is critical to speeding up ongoing research. Notably, a number of business publishers and vendors have taken the lead and made resources linked to COVID-19 freely available. Others have made it simpler

to log in and access resources from outside of official networks by making it easier to log in and access materials from outside of official networks. The National Digital Library of India (NDLI), a project of IIT Kharagpur, has opened its services to the public, providing COVID-19-related literature and information ranging from research writings, projects, funding, start-ups, datasets, and multimedia contents under a single section titled "COVID-19 Research Repository."

## UGC Initiatives during COVID-19

The University Grants Commission (UGC) has produced a list of projects that academics can participate in while the country is on lockdown owing to the corona virus outbreak. SWAYAM, MOOCs, and other efforts are among them. Teachers, students, and researchers in Universities and Colleges can use these resources, which are in the form of digital platforms, to expand their learning horizons. All Tamil Nadu State Academic faculty members, students, and research scientists were informed about this project. The following is

**SWAYAMonline courses:** https://storage.googleapis.com/uniquecourses/online.html provides free access to the best teaching learning resources that were previously delivered on the SWAYAM Platform and may now be seen by any learner without having to register.

**MOOCs** for undergraduates and graduate students:

http://ugcmoocs.inflibnet.ac.in/ugcmoocs/moocs courses.php provides learning materials from SWAYAM's archived UG and PG (Non-Technology) courses.http://epgp.inflibnet**.ac.in/.**

## e-PG Pathshala:

http://epgp.inflibnet.ac.in/. hosts high-quality, curriculum-based, interactive e-content with 23,000 modules (e-text and video) in 70 postgraduate fields including social sciences, arts, fine arts and humanities, natural and mathematical sciences.

## Courseware in UG subjects using e-Content:

On the CEC website at http://cec.nic.in, there is e-content in 87 undergraduate courses with approximately 24,110 e-content modules.

**SWAYAMPRABHA:**

https://www.swayamprabha.gov.in/ is a group of 32 DTH channels that provide high-quality educational curriculum-based course contents covering diverse disciplines such as arts, science, commerce, performing arts, social sciences and humanities subjects, engineering, technology, law, medicine, agriculture, and other subjects to all teachers, students, and citizens across the country who are interested in lifelong learning.

**YouTube channel of the CEC-UGC:**

http://www.youtube.com/user/cecedusat offers free access to an endless number of educational curriculum-based lectures.

**National Digital Library:**

The National Digital Library (NDLI) is a digital repository of a vast amount of academic content in various formats, with interface support for leading Indian languages for all academic levels, including researchers and lifelong learners, all disciplines, all popular access devices, and differently-abled learners. Students in the Science, Engineering, and Social Science streams can benefit by going to https://www.ndl.gov.in/ or https://ndl.iitkgp.ac.in/ and clicking the "Corona Outbreak: Study from Home" button at the top to access, free of charge, Video lectures, Web courses, Notes, Questions, Solutions, and other resources on various subject areas they are studying from authoritative sources to continue their studies effectively during this difficult situation resulting from the suspension of classes and closure of libraries due to COVID-19 Lockdown.

**N-LIST(INFLIBNET):**

**https://nlist.inflibnet.ac.in/**

("National Library and Information services Infrastructure for Scholarly Content")

"National Library and Information Services Infrastructure for Scholarly Content," or N-LIST, is an acronym for "National Library and Information Services Infrastructure for Scholarly Content." From 2010 to 2013, the MHRD supported the NME-ICT initiative to provide access to specified e-resources to colleges covered by Section 12B of the UGC Act as well as non-aided colleges. (N-LIST) Beneficiary colleges can access 6,150 electronic journals and 31,64,309 electronic books, including e-books available through national subscription, through the N-LIST, a college component of E-Shodh Sindhu. Through the N-LIST initiative, all colleges covered by Sections 12(B) and 2(f) of the UGC Act are able to access e-

resources. By joining the N-LIST programme, non-aided colleges (excluding Agriculture, Engineering, Management, Medical, Pharmacy, Dentistry, and Nursing) can benefit from the programme. In the year 2012, the Mahatma Gandhi University Library hosted an Orientation Program to promote the N-LIST Program to colleges and to explain the procedures for registering colleges with the programme. The Principals and Librarians of linked colleges were fairly well represented at the Orientation session.

**Shodhganga:**

https://shodhganaa.inflibnet.ac.in is a digital repository platform for research students to deposit their Ph.D. theses and make them open access to the entire scholarly community.

**e-Shodh Sindhu:**

https://ess.inflibnet.ac.in/ provides current and archival access to more than 15,000 cores and peer-reviewed journals, as well as a number of bibliographic, citation, and factual databases in various disciplines from a large number of publishers and aggregators to its member institutions, which include centrally-funded technical institutions, universities, and colleges that are covered under the I2 (B) and 2 (f) Sections of the UGC Act.

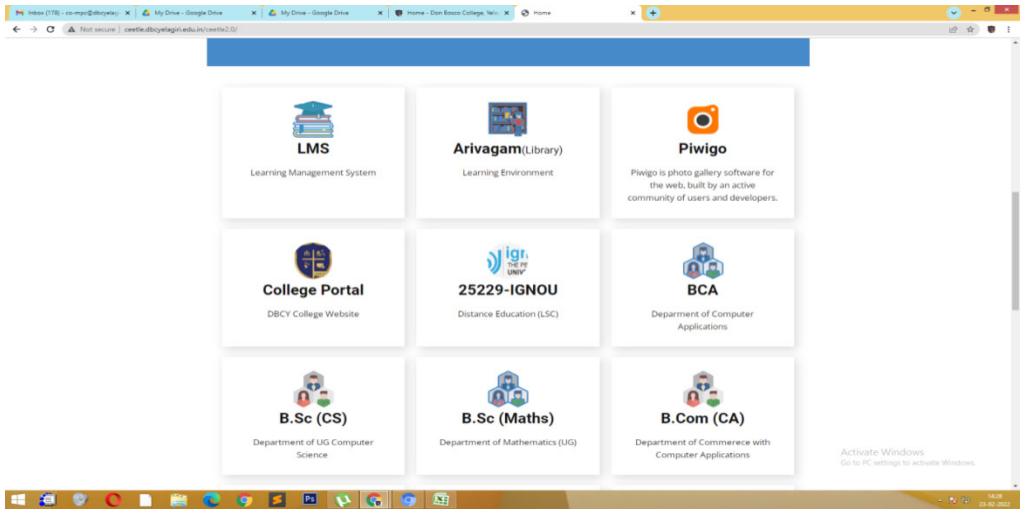
**D-SPACE:**

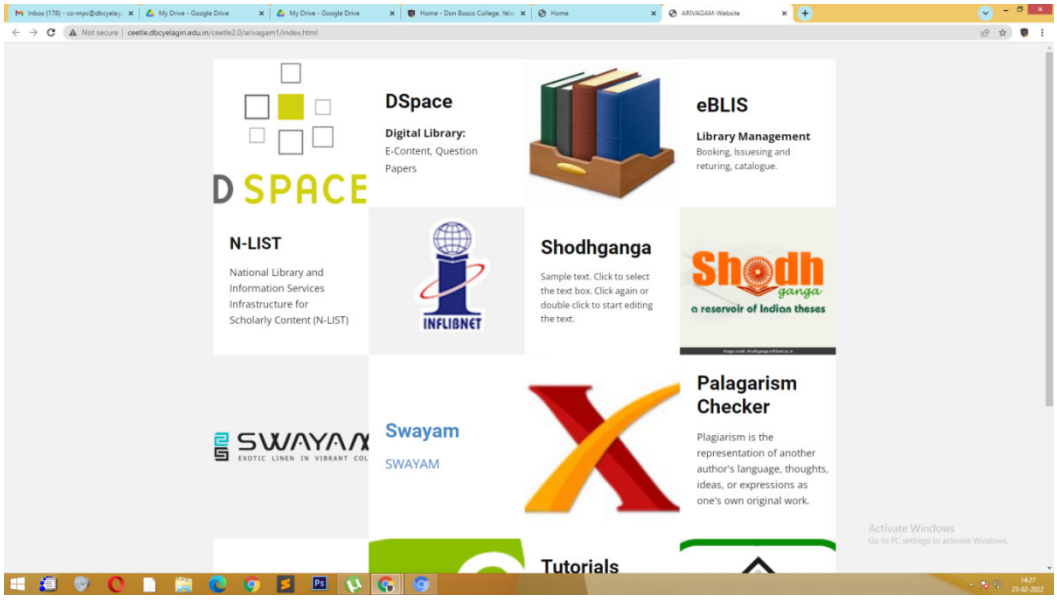
D-Space is the software of choice for academic, non-profit, and commercial organizations building open digital repositories. D-Space preserves and enables easy and open access to all types of digital content including text, images, moving images, mpegs and data sets. D-Space is an open source repository application that allows you to capture, store, index, preserve and distribute your digital material including text, video, audio and data. ... There are over 1000 digital repositories worldwide using the D-Space application for a variety of digital archiving needs.

**CEETLE:**

**CEETLE is the eldevearning platform developed and promoted by the department. CEETLE stands for Computer- based Education Environmentof Teaching , Learningand Evaluation. It provides multiple areas for research and development.**

**https://dbcvelagiri.edu.in/ceetle2.0**




**During COVID -19, ad hoc services were introduced.**

**Access to Print Materials:**

The Tamil Nadu Academic Libraries have made a concerted effort to make their print collection accessible to their patrons. They've put together a list of course reading materials and provided a link to it, as well as introducing on-demand delivery of scanned pages from a chapter or two of a print document in the library collection.

**Easing of Penalty Rules:**

Penalty rules have been relaxed at the Tamil Nadu Academic Library, which has extended the due date for all types of reading materials supplied to all categories of members till February 4, 2022. The library, on the other hand, has renewed thousands of books issued prior to the lockdown in order to protect pupils.

**Information retrieval and scholarly writing assistance:**

Libraries are doing wonderful job to inform and help their members in this difficult time in order to reduce the stress level of users seeking the essential information. The online website of the Tamil Nadu Academic Library greets visitors with the statement "We are always here for you," while the library page states, "We are available both physically and virtually." All of these tag lines provide a strong motivational push to alleviate COVID-related anxieties in the minds of library visitors. The virtual aspect of library services, which is in accordance with ongoing technology progress, has gotten a boost during the COVID -19 health emergency. During the COVID -19 responsibilities on delivering physical services in person, it was discovered that libraries' efficiency in providing virtual reference services in a new and improved manner increased. From requisition through supply, many attempts have been made to virtualize Inter library loan services. Similarly, plagiarism checking, email alert services, and scanned document services were designated as priority services, and libraries made every effort to promote them on the web.

**Preventive Measures and Guidelines:**

During the lockdown, libraries face obstacles and limits. Governments take a variety of approaches, sometimes ordering the complete closure of all institutions; in these cases, UPES took the following precautionary measures to stop COVID19 from spreading through libraries:

1. If you're sick, stay at home.
2. Use a sanitizer on a regular basis.
3. Duty roster of the staff
4. When checking in/out, keep books in a separate location for at least 48 hours.
5. Keep a safe social distance
6. Maintain good health and hygiene.
7. Limiting users' concentration in the reading room
8. When sneezing or coughing, wear a mask and protect your mouth.

9. When touching books, avoid sneezing or coughing.

10. Keeping surfaces clean, such as doorknobs, switches, and railings in the library, is a must.

11. Share knowledge/information using internet platforms or social media.

12. Provide users with remote access to library resources.

13. Encourage libraries to adopt a paperless work culture.

14. Commonly used materials such as magazines and newspapers may be restricted to those wearing gloves and masks, among other things.

**Conclusion:**

Because stringent social distance and lockdown measures were established in the early stages of the COVID-19 pandemic, sudden and dramatic adjustments in library service delivery were required. Even at this tough and uncertain time, the Internet and web technologies have created a new and unequalled environment, allowing libraries to expand and strengthen research, teaching, and learning. The concept and practise of libraries giving remote access to digital resources is not new, but Tamil Nadu Academic Libraries' user-friendly approach and the volume of resources made available during the pandemic are exceptional.

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# Open Source Softwaresin Libraries

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## Abstract:

*Open source software is, software that users have the ability to run, copy, distribute, study, change, share and improve for any purpose. Open source library software's does not need the initial cost of commercial software and enables libraries to have greater control over their working environment. Library professionals should be aware of the advantages of open source software and should involve in their development. They should have basic knowledge about the selection, installation and maintenance. Open source software requires a greater degree of computing responsibility than commercial software. Library professionals do not think seriously about the advantages of open source software for automation and hence are reluctant to use it. They do not have the expertise to support open source software. Paper highlights major open source library software.*

**Keywords:** *Open Source Software, Library technology, Information Technology*

## Introduction:

Open source software is computer software whose source code is available under a license that permits users to study, change, and improve the software, and to redistribute it in modified or unmodified firm. It is often developed in a public, collaborative manner. It is the most prominent example of open source development and often compared to user generated content. For many libraries, organizing their books and other media can be daunting task, especially as the library grows with more material. Years age we had crude card catalogue systems that kept things organized, but were difficult to maintain. With today's computing technology, organizing our libraries has never been easier or more efficient. Gone is the card catalogue and in some libraries, it's much easier to locate a book through and internet connection and picking it up upon your arrival, rather then wasting the time scouring the aisles looking for your next read. Now just because the world has been blessed with wonderful software solutions that make everything easier to do, doesn't mean that every library in the universe is using these solutions. Many Libraries do not have huge amounts of money to burn, and any that they do get

usually goes to purchasing additional resources. Because of this need for software and the lack of money available to spend on it, many libraries are left to fend for themselves when it comes to staying up to date with the latest technology. Unless, of course, they embrace the open source movement and use some of the countless software solutions available to help out. Most software that we all use everyday is known as "**proprietary**", which in a nutshell means that it costs money and that the actual code of the software is restricted, in that the code of the software cannot be modified, copied, or changed from its original construction. The code is "unreadable" and pretty much is what it is. **Open source software**, on the other hand, is quite the opposite. The open source mentality revolves around sharing and collaboration, and these two important elements describe open source software perfectly.

First and foremost, open source software is free for anyone to have; more importantly, not only is the software free, but it is also free for anyone to copy, hack, modify, etc. This increases the possibilities of a software program's potential because of this free-thinking model. Many large groups of programmers have customized basic open source programs into whatever they deemed necessary, and have in turn given these modifications back to the open source community for free where others can continue to build on their work. There are many different kinds of open source software solutions out there today that could be embraced by the library. There's basic operating system, document processing programs, Library Management Software (LMS) and Digital Library software.

**Open Source Movement:**

In 1998, a group of individuals advocated that the term free software be replaced by open source software as an expression which is less ambiguous and more comfortable for the corporate world. Software developers may want to publish their software with an open source software license, so that anybody may also develop the same software or understand how it works. Open source software generally allows anybody to make a new version of the software, port it to new operating systems and processor architectures, share it with others or market it. The aim of open source is to let the product be more understandable, modifiable, duplicatable, reliable or simply accessible, while it is still marketable. The Open Source Definition, notably, presents an open-source philosophy, and further defines a boundary on the usage, modification and redistribution of open-source software. Software licenses grant rights to users which would otherwise be prohibited by copyright. These include rights on usage, modification and redistribution. Several open-source software licenses have qualified within the boundary of the Open Source Definition. The most prominent example is the popular GNU General

Public License. While open source presents a way to broadly make the sources of a product publicly accessible, the open-source licenses allow the authors to fine tune such access.

The "open source" label came out of a strategy session held in Palo Alto in reaction to Netscape's January1998 announcement of a source code release for Navigator. A group of individuals at the session included Todd Anderson, Larry Augustin, John Hall, Sam Ockman, Christine Peterson and EricS. Raymond. They used the opportunity before the release of Navigator's source code to clarify a potential confusion caused by the ambiguity of the word "free" in English. The 'open source' movement is generally thought to have begun with this strategy session. Many people, nevertheless, claimed that the birth of the Internet, since 1969, started the open source movement, while others do not distinguish between open source and free software movements.

The Free Software Foundation, started in 1985, intended the word 'free' to mean "free as in freespeech" and not "free as in free beer." Since a great deal of free software already was free of charge, such free software became associated with zero cost, which seemed anti-commercial.

**Advantages of Open Source Software**

- **Lower software costs:** Open source solutions generally require no licensing fees. The logical extension is no maintenance fees. The only expenditures are for media, documentation, and support, if required.
- **Simplified license management:** Obtain the software once and install it as many times and in as many locations as you need. There's no need to count, track, or monitor for license compliance.
- **Lower hardware costs:** In general, Linux and open source solutions are elegantly compact and portable, and as a result require less hardware power to accomplish the same tasks as on conventional servers (Windows, Solaris) or workstations. The result is you can get by with less expensive or older hardware.
- **Scaling/consolidation potential:** Again, Linux and open source applications and services can often scale considerably. Multiple options for load balancing, clustering, and open source applications, such as database and email, give organizations the ability to scale up for new growth or consolidate to do more with less.
- **Support:** Support is available for open source—often superior to proprietary solutions. First, open source support is freely available and accessible through the online community via the Internet. And second,

many tech companies are now supporting open source with free online and multiple levels of paid support. For example Liblime.

- **Escape vendor lock-in:** Frustration with vendor lock-in is a reality for all IT managers. In addition to ongoing license fees, there is lack of portability and the inability to customize software to meet specific needs. Open source exists as a declaration of freedom of choice.
- **Unified management:** Specific open source technologies such as CIM (Common Information Model) and WBEM (Web Based Enterprise Management) provide the capability to integrate or consolidate server, service, application, and workstation management for powerful administration.
- **Quality software:** Evidence and research indicate that open source software is good stuff. The peer review process and community standards, plus the fact that source code is out there for the world to see, tend to drive excellence in design and efficiency in coding.

## Open Source Software for Libraries in Library Automation:

### Koha: Integrated Library System

Koha is a promising full featured open source ILS currently being used by libraries all over the world. For those of you out there unfamiliar of what an ILS is, well, it is a system of keeping track of the operations of a library - payroll, expenses, purchases, and most importantly, keeping track of the various media being checked out by the librarians patrons. Many smaller libraries cannot afford to purchase, install, and maintain an ILS, and Koha is a perfect alternative. Koha is built using library ILS standards and uses the OPAC interface. In addition, Koha has no vendor-lock in, so libraries can receive tech support from any party they choose.

**NewGenLib:** NewGenLib (New Generation Library) is an Integrated Library Automation and Networking Solution Developed by Verus Solutions Pvt Ltd and The Kesavan Instituteof Information and Knowledge Management, India. In March 2005, NewGenLib version1.0 was released and versions 2.0 and 2.1 have come up later. On 9th January 2008, NewGenLib has been declared Open Source Software under GNU GPL Licence by the Verus Solutions Pvt Ltd, Hyderabad, India.

**Evergreen:** Evergreen ILS is another option when researching open source ILSoptions. Developed by Equinox Software, Evergreen is a robust, enterprise level ILS solution developed to be capable of supporting the workload of large libraries in a fault-tolerant system. It too is standards compliant and uses the OPAC interface, and offers many features including flexible administration, work-flow

customization, adaptable programming interfaces, and because its open source, cannot be locked away and can benefit from any community contributions.

**Digital Library:**

**Greenstone Digital Library Software:** The Greenstone digital library software is an open-source system for the construction and presentation of information collections. It builds collections with effective full-text searching and metadata-based browsing facilities that are attractive and easy to use. Moreover, they are easily maintained and can be augmented and rebuilt entirely automatically. The system is extensible: software "plugins" accommodate different document and metadata types. The aim of the Greenstone software is to empower users, particularly in universities, libraries, and other public service institutions, to build their own digital libraries.

**DSpace:** Dspace is a groundbreaking digital institutional repository that captures, stores, indexes, preserves, and redistributes the intellectual output of a university's research faculty in digital formats. It manages and distributes digital items, made up of digital files and allows for the creation, indexing, and searching of associated metadata to locate and retrieve the items. D Space design and developed by Massachusetts Institute of Technology Libraries and Hewlett-Packard. D Space was designed as an open source application that institutions and organizations could run with relatively few resources. It is to support the long-term preservation of the digital material stored in the repository. It is also designed to make submission easy. D Space supports submission, management, and access of digital content.

**EPrints:** Eprints is an open source software package for building open access repositories that are compliant with the Open Archives Initiative Protocol for Metadata Harvesting. It shares many of the features commonly seen in Document Management systems, but is primarily used for institutional repositories and scientific journals. EPrints has been developed at the University of Southampton School of Electronics and Computer Science and released under a GPL license.

**Fedora:** Fedora open source software gives organizations a flexible service-oriented architecture for managing and delivering their digital content. At its core is a powerful digital object model that supports multiple views of each digital object and the relationships among digital objects. Digital objects can encapsulate locally managed content or make reference to remote content. Dynamic views are possible by associating web services with objects. Digital objects exist within a repository architecture that supports a variety of management functions. All functions of Fedora, both at the object and repository level, are exposed as web services. These functions can be protected with fine-grained access control policies. This unique

combination of features makes Fedora an attractive solution in a variety of domains. Some examples of applications that are built upon Fedora include library collections management, multimedia authoring systems, archival repositories, institutional repositories, and digital libraries for education.

**Web Publishing:**

**Wordpress:** Wordpress started out as a quick, free, open-source solution blogging solution just a few years ago; today it is a perfect alternative to building a web site from scratch. In addition to being free to use (and easy to install), the Wordpress community has exploded, with thousands of users and programmers creating custom themes and plug-ins to completely change the way the software looks and operates. The most important aspect of the software is it's easy-to use interface and content management system.

**Drupal:** Drupal is another open source web publishing option that allows an individual or a community of users to easily publish, manage and organize a wide variety of content on a website. Tens of thousands of people and organizations have used Drupal to power scores of different web sites, including Community web portals, Discussion sites, Corporate websites, Intranet applications, Personal web sites or blogs, E-commerce applications, Resource directories, Social Networking sites.

**Other Computer Programs:**

**Ubuntu:** Ubuntu the most popular player in the Linux based operating system game. Ubuntu is a perfect solution for libraries who need to upgrade their older computers using outdated Windows or for bulk computer purchases requiring a new operating system. Many libraries feature computers for users to gain access to the internet, and that being the only function those computers serve.

**Open Office:** OpenOffice.org is a multiplatform and multilingual office productivity suite and an open-source project. Compatible with all other major office suites, the product is free to download, use, and distribute. It includes the key desktop applications, such as a word processor, spreadsheet, presentation manager, and drawing program, with a user interface and feature set similar to other office suites. Sophisticated and flexible, Open Office. orgalso works transparently with a variety of file formats, including those of Microsoft Office, and the vendor-neutral Open Document standard from OASIS.

**Firefox:** Firefox is the Mozzila organizations answer to Microsoft's Internet Explorer webbrowser, and has taken the web by storm over the past few years as the biggest competitor to IE in quite some time. Firefox offers a much more secure browsing experience compared to IE.

**Thunderbird:** Thunderbird Firefox's little brother program, Thunderbird, is the Mozilla foundations open source alternative to Microsoft's Outlook Express. The program works exactly like Outlook, providing you with a secure and safe desktop email solution. And just like Firefox, the open source programming community has created free add-ons to make the Thunderbird

email client customized to your liking. If you absolutely need a desktop email client, then Thunderbird is the open source program you need.

**PDF Creator:**

The PDF file is an industry standard format that everybody uses every day. The purpose of creating a PDF file is usually to provide an important document for display that cannot be modified by the reader. Many programs exist that will enable you to create your own PDF files, but they require you to spend money, which is not in our budget. Instead, we're going to use the open-source PDF creator to take our Open Office files and convert them into professional PDF documents.

**Selection criteria of open source software:**

Evaluation of open source software is different from proprietary programs. A key difference for evaluation is that the information available for open source programs is usually different than for proprietary programs; source code, analysis by others of the program design, discussion between users and developers on how well it is working, and so on. Often proprietary programs always hide all information from users and only allow running the software. Following criteria's can be adopted for open source software selection:

**Open Source Softwares on the WWW**

Most convenient option to identify particular software for your library need is to ask professional friends who have experience in using open source softwares. You can directly contact other libraries in your locality or post a message in any popular email discussion forum of librarians. Certain open source softwares are highly popular among librarians community, for example Greenstone digital library software is a favorite candidate for the libraries who make use it for the collection and organization of digital materials. Librarians can select the software without much effort, if more popular software's are available for various library purposes. Websites which provide detailed listing of open source software are:

· Free Software Foundations software directory

· UNESCO Free & Open Source Software Portal

· Source Forge

**Open source licenses:**

Open source licenses are assure users freedom to use, copy, improve and distribution of software. GPL is the most popular license for free and open source software and provides feasible terms of use. Using GPL license, a user can modify the software without the permission of its creator. At the same time BSD license impose certain restrictions on modification of software without the permission of its developer. If you have decided to choose the software with non General Public License, check the license if it contains any un-acceptable clauses.

**Functional modules:**

Certain features or modules essential for day to day work may not be available with the initial development stages of open source softwares. In such cases, libraries have to purchase additional modules from open source service providers or make use the in-house expertise to build the required features. Functional modules essential for library management systems (ILS) are cataloguing, circulation, OPAC, serial control and acquisition. It is essential to read release notes of latest version and software road map to know which features are already available and are expected in future.

**Stable releases:**

Stable release of open source software shows its developer's ability to fix and correct bugs along with new features. Version history of open source software is often available from project websites or any other project repositories like Source Forge, Savannah and Free Software Foundations software directory. These services help users to check the information regarding software origin, releasing history, version numbering scheme, developers details. Actively maintained open source projects mention even the releasing dates of forthcoming versions.

**Developers and user community:**

The development and maintenance of open source software is a social collaborative activity. Open source software is actively developed on a 24-hour basis by a large number of programmers from all over the world. Depending on the success of a certain open source software project, this results in a development process that out paces that of many competitors. Another aspect of open source software is that, many different people and organisations look at the software from a different perspective. They usually encourage the participation of those who use the software in its further development. If everything is quiet on the development front, it might be that work has been suspended or even stopped.

**User interface:**

Most of the open source library softwares are available with web interface. Software with web interface is easier to learn and use. Graphical templates of open source softwares are possible to customize and users can add new design. Through redesigning the templates and style sheets open source software can easily integrate with library/institutional websites. Separate administrative and user interface is essential for remote access and maintaining security.

**Documentation:**

So users are mainly responsible for the deployment of open source software; detailed and up-to-date documentation is a prerequisite for successful installation and maintenance. Open source software documentation is available through project websites, wikis, blogs and email lists. They give information of software installation in various operating systems, software architecture, database structure, history of bug fixes, changes in new release, road map (wish list) of future releases etc. Installation details and information for users are also available with installation package. Individual documentation for developers, administrator and user is another advantage of open source software documentation. Software community incessantly updates the online documentation and it is better to make use the online wiki or email lists for error fixing and clearing doubts.

**Conclusion:**

So, it seems that there are some very powerful solutions available today that could be used to create a much more resourceful library. By using open source software in the library, money that otherwise would be spent on software solutions can be used for other important resources, such as purchasing additional media resources (books, journals, etc.), or can be used to hire educated, technical support that provides patrons with the know how to better use already existing resources. In addition, this free software is constantly being updated, changed, and customized to meet the library's needs. While all of this is fine and dandy, and sounds like the win-win solution for your library, there are still pitfalls and hurdles we'll need to overcome. Hopefully this article provides some introductory information as to how to wean your library off of traditional computing products and dive into the pool of open source resources available today.

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# Open Source software in Libraries: Challenges and Opportunities

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**Abstract**

*Today, open source software is used for all library functions. Here are the challenges of using open source software and their practicality. Here are some things to keep in mind when choosing open source software. A suitable environment should be set up in the library to deal with problems that may arise during their selection, installation and use.*

## Introduction

Modern libraries are always innovative and provide a variety of new services to their users with the help of ICT applications. Effective service with open and closed digital resources can be a challenging task for library professionals. Currently Many computer applications are open source, and it will help the services such as library automation, library website management, and knowledge management which make librarians a wider scope of work. There are many open source software available today that can help with library activities. That is why many libraries are trying to streamline their service with this software. Public libraries and academic libraries alike try to use this software to do library automation and library management. There are many types of open source software and applications for automation promotion of libraries and services. There is a lot of open source software such as DSPACE, GSDL, E-Prints, KOHA, Drupal, NewGenLib etc. coming to help librarians and it provides efficient, effective and consistent information service to their clients.

### Open Source Software

OSS are computer programs in which the source code is made available to the general public for use and/or modification from its original design free of charge, i.e. open. Open source programs are typically created as a collaborative effort in which programmers offer the user a flexibility of use and share the changes within the community.[1] Open source software is software which is licensed to guarantee

free access to the programming behind the pre-compiled binary, otherwise called the 'source code'. This allows the user to install the software on a new platform without an additional purchase, to get support (or create a support mechanism) for a product whose creator no longer supports it. Those who are technically inclined can fix bugs themselves rather than waiting for someone else to do so. Generally there is a distribution mechanism, such as anonymous ftp, which allows one to obtain the source code, as well as pre-compiled binaries in some cases. There are also mechanisms for which one may pay a fee to obtain the software as well, such as on a CD-ROM or DVD, which may also include some technical support.[2] A variety of licenses are used to ensure that the source code will remain available, wherever the code is actually used. Open source software means not only access to the source code, it should also meet the distribution and redistribution terms of open source software criteria which are as follows;

1. Free Redistribution
2. Source Code
3. Derived Works
4. Integrity of the Author's Source Code
5. No Discrimination against Persons or Groups
6. No Discrimination against Fields of Endeavor
7. Distribution of License
8. License Must Not Be Specific to a Product
9. License Must Not Restrict Other Software
10. License Must Be Technology-Neutral [3]

**Purpose of Open Source Software**

- To promote creative development of software
- To help those who can't afford proprietary software, can choose open source programs
- To customize the software as per their library needs
- To make new version freely available
- To establish community discussion forums which are freely available for help
- To promote computer literacy among professionals

- To make it easy to migrate to any other software[4]

**Challenges in application of OSS in Libraries**

- **Data security**: Data security is a big issue as the source code is open. A situation where anyone can change our data may be made available to others if the source code is not properly configured.
- **Lack of Skills** : Only a skilled librarian can handle the software effectively and appropriately
- **Up-gradation**: It is difficult for a typical librarian to upgrade an existing source code as new versions are upgraded.
- **Installation and Customization**: The librarian's IT skills are insufficient to install and customize the software and will have to constantly rely on IT professionals.
- **Support:** Libraries are assisted by outside companies to perform software installations. They often charge a hefty fee for this.
- **Sustainability:** The existence of software is always uncertain. It is not possible to say when an error will occur or if a crack will occur. Only a highly qualified IT professional can assist the librarian in handling the software at such stages.

## When choosing open source software…

There are many types of open source software today. Library management software, integrated software and digital library software are available to us today in many forms. So there are some things to keep in mind when choosing these. We need to think about whether we can manage the software we have available with the skill we have, whether it fits into our budget, how safe it is, whether they are reliable according to our organizational rules, and whether we have the necessary support to handle any problems that may arise.

Therefore, when choosing software, our focus should be on the following:

- Knowledge and skills
- Guide for uses
- Releases with stable grade
- Documentation
- Safety measures
- Support and maintenance

- The user community
- Licensing
- Agenda and budget[5]

## Best practices

- Librarians need continuous training. Source code is always changing, so mastering the technology is required to manage the software according to the updated versions.
- It would be nice to have an inter-library link and collection development work together to address the cost. The collection development collaboration helps to avoid wastage of time and money by avoiding digitization of the same book multiple times.
- Saving data across different systems or in different locations may increase data security as there may be cases of software malfunction or system malfunction.

## Conclusion

Open Source Software is suitable for long term use in libraries. Using Open Source Software along with standard software might provide the perfect balance. While Open Source Software offers a variety of exciting possibilities, it is imperative to research the application thoroughly before selecting it for the library. OSS has provided libraries with new ways and means to manage the library databases, collections, services, and facilities without investing too much in infrastructure development. By using the source for the better service, OSS also gives users the opportunity to modify the software by themselves. OSS is the best and most cost-effective way to automate academic and research organizations especially the library and information services to serve maximum users at the lowest cost.

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# Open Access Repositories Software Comparison: Dspace, Eprints, Bepress In Roar

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## Abstract

*This Article tabulates the OARs (Open Access Repositories) available across the globe and are registered in ROAR Registry of Open Access Repositories, the software's (Dspace, Eprint, Bepress) used country wise and continent wise. It also classifies the top three nations that utilise each software by continent.*

***Keywords****: Open Access, Institutional Repositories, ROAR, DSpace, Eprint, Bepress*

## INTRODUCTION

Open ROAR is a global directory of Open Access Repositories. This repository host free open access repositories that can access academic resources. They continue to promote open access development by disseminating information about the proliferation and availability of repositories all across the entire globe. This is a comparative study among software Dspace, Eprint and Bepress practiced in terms of the world's geographical dispersion.

## OBJECTIVES

- The primary objective is to comparatively study the number of OARs that use Dspace, Eprint, Bepress .
- To observe Geographical distribution of repositories of OARs
- To identify Dspace, Eprint, Bepress as software's used to access IRS in Various countries
- To identify the top three Country by continent for utilizing Dspace, Eprint, Bepress.

## SCOPE

The data for the present study was collected exclusively from the "Registry of Open Access Repositories'', ROAR (http://roar.eprints.org/)

## METHODOLOGY

The ROAR database is a collection of all the OARs available in the world as a whole. These databases are used here to extract the required objectives and present the results in peculiar aspects. As of March 2022, there are 4725 repositories available in the ROAR database. The study concentrates on the selection and analysis of the comparison between the DSpace, Eprints and Bepress softwares Open Access Repositories in ROAR databases.

## FINDINGS AND DISCUSSIONS

### *Geographical Distribution of Repositories*

According to table 1 all continent are maintaining OARs in ROAR databases. They are 124 Countries that registered their institution repositories in the databases. From the table after analysis it is identified that European Continent is the major contributor with 1927 in ROAR with 41 countries, Asian continent secures the second rank with 33 countries has 1125 in ROAR. It is closely followed by North America that has 1058 in ROAR with 5 countries. The fourth places is retained by South America with 9 countries, has 639 in ROAR. African continent has 201 in ROAR with 23 countries, Australian continent has 106 in ROAR with 2 countries, Central America has 30 in ROAR with 35 countries, Caribbean has 25 in ROAR with 5 countries, and Oceania has 3 in ROAR with 2 countries. It is prominent that European continent have substantial number of Open access repositories in ROAR databases and possess the most number of institutional repositories.

**Table 1: Continent wise Distribution of Open Repositories**

| Continent | No. of countries | No. of OARs |
|---|---|---|
| Europe | 41 | 1927 |
| Asia | 33 | 1125 |

| | | |
|---|---|---|
| North America | 5 | 1058 |
| South America | 9 | 639 |
| Africa | 23 | 201 |
| Australia | 2 | 106 |
| Central America | 4 | 30 |
| Caribbean | 5 | 25 |
| Oceania | 2 | 3 |
| Total = | 124 | 5114 |

Table 2 displays the country wise availability of open repositories in all the continents listed in the table 1. The highest status for the number of OARs registered in ROAR database is held by United States of America with 895 repositories in ROAR from the continent of North America. The second rank falls to United Kingdom from Europe continent with 262 repositories in ROAR. And also third position to Germany from European continent with 261repositories in ROAR. And fourth place to Japan from Asian continent with 242 repositories in ROAR. The fifth place to Spain from European continent with 201 repositories in ROAR. And sixth place to Brazil from South American continent with 186 repositories in ROAR. The seventh place to Indonesia from Asian continent with 175 repositories in ROAR. And also eighth place to Turkey from Asian continent with 164 repositories in ROAR. The ninth place to Peru from South American continent with 161 repositories in ROAR and finally tenth place to India from Asian continent with 131 repositories in ROAR.

**Table 2: Country wise distribution of no. of OARs**

| Europe | ROAR | South America | ROAR | Asia | ROAR |
|---|---|---|---|---|---|
| UK | 262 | Brazil | 186 | Japan | 242 |
| Germany | 261 | Columbia | 128 | Turkey | 164 |
| Spain | 201 | Argentina | 72 | India | 131 |
| France | 102 | Peru | 161 | Taiwan | 83 |
| Italy | 98 | Ecuador | 31 | Indonesia | 175 |
| Poland | 128 | Chile | 27 | China | 96 |
| Ukraine | 118 | Venezuela | 24 | Korea | 53 |
| Norway | 59 | Bolivia | 3 | Malaysia | 42 |
| Portugal | 62 | Uruguay | 7 | Thailand | 15 |
| Sweden | 76 | **Africa** | **ROAR** | Sri Lanka | 2 |
| Greece | 41 | South Africa | 52 | Bangladesh | 11 |
| Hungary | 47 | Kenya | 30 | Iran | 16 |
| Netherlands | 46 | Nigeria | 17 | Saudi Arabia | 10 |
| Russia | 67 | Algeria | 15 | Philippines | 15 |
| Belgium | 37 | Tanzania | 9 | Singapore | 6 |

| | | | | | |
|---|---|---|---|---|---|
| Belarus | 34 | Zimbabwe | 12 | Hong Kong | 10 |
| Ireland | 27 | Sudan | 13 | Kazakhstan | 10 |
| Croatia | 7 | Egypt | 12 | Georgia | 2 |
| Switzerland | 30 | Ghana | 6 | Kyrgyzstan | 4 |
| Czech Rep. | 16 | Uganda | 8 | Azerbaijan | 5 |
| Austria | 27 | Senegal | 2 | Iraq | 3 |
| Finland | 23 | Rwanda | 1 | Armenia | 2 |
| Denmark | 17 | Namibia | 2 | Palestinian | 7 |
| Lithuania | 11 | Morocco | 4 | Qatar | 1 |
| Serbia | 41 | Ethiopia | 3 | Lebanon | 3 |
| Bulgaria | 11 | Malawi | 1 | Nepal | 3 |
| Moldova | 18 | Botswana | 4 | Pakistan | 7 |
| Estonia | 6 | Mozambique | 2 | Afghanistan | 1 |
| Cyprus | 7 | Lesotho | 2 | Syria | 1 |
| Luxembourg | 2 | Cameroon | 1 | Samoa | 1 |
| Iceland | 2 | Tunisia | 2 | Polynesia | 1 |
| Slovenia | 10 | Libya | 2 | Israel | 1 |
| Latvia | 5 | Somalia | **1** | UAE | **2** |

| | | | | | |
|---|---|---|---|---|---|
| Macedonia | 3 | **North America** | **ROAR** | **Australia** | **ROAR** |
| Romania | 16 | United States | 895 | Australia | 84 |
| Albania | 1 | Canada | 97 | New Zealand | 22 |
| Malta | 1 | Mexico | 52 | **Central America** | **ROAR** |
| Bosnia Herzegovina | 3 | Panama | 5 | EI Salvador | 13 |
| French Guayana | 2 | Costa Rica | 9 | Costa Rica | 9 |
| Martinique | 2 | **Caribbean** | **ROAR** | Honduras | 1 |
| **Oceania** | **ROAR** | Cuba | 14 | Nicaragua | 7 |
| Fiji | 2 | Dominican Rep. | 4 | | |
| New Caledonia | 1 | Jamaica | 1 | | |
| | | Puerto Rico | 1 | | |
| | | Guadeloupe | 2 | | |

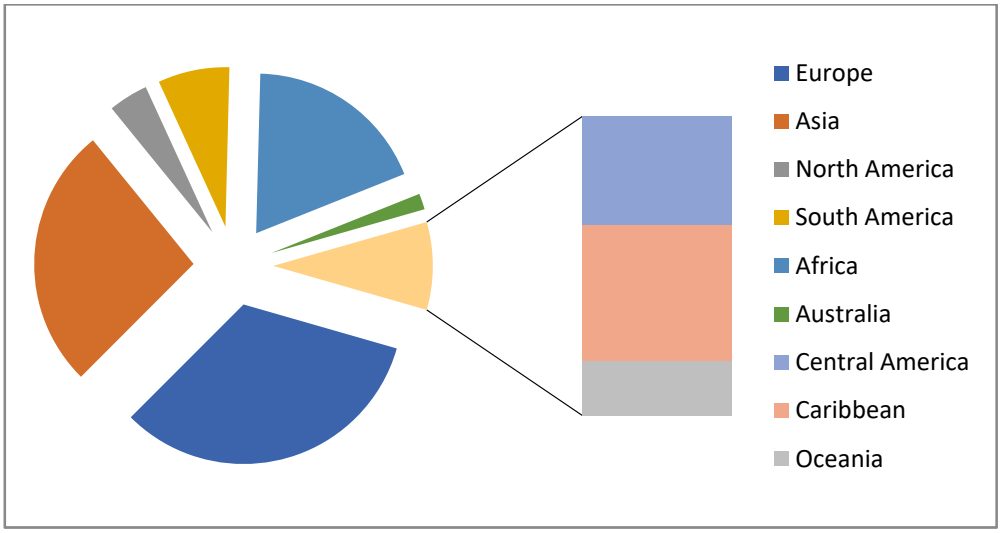



***Fig 1: Continental distribution of OARs in ROAR***

These charts represent the values of continent based on, number of Open access repositories in each continent in ROAR database respectively.

***Geographical distribution of OARs Using DSpace, Eprints & Bepress:***

These table 3 portraits the Usage of DSpace, Eprints, Bepress softwares to a global extent in country wise. Its lists the number of institutional repositories that are registered in ROAR databases in various countries worldwide. The first and used in most elevated numbers to access 165(18.43%) DSpace software with 895 repositories in the United States of North America by ROAR. Next the first and utilized in most raised numbers to access 129 (72.47%) Eprints software with 175 repositories in the Indonesia of Asian continent. Furthermore the first and used in most highest numbers to access 441(49.27%) Bepress software with 895 repositories in the United States of North America by ROAR databases. A second level used from ROAR number to access 138 (85.71%) DSpace software with 161 repositories in the Peru from South American continent. Followed by next the second and used in most raised numbers to access 120 (45.80%) Eprints software with 262 repositories in the United Kingdom of European continent. And 10 (10.30%) Bepress software has been used to access the second and raised number of repositories in Canada of North America with 97 repositories.

**Table 3: Country wise usage of Dspace,Eprints,Bepress**

| Europe | ROAR | | | Asia | ROAR | | | South America | ROAR | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | **Dspace** | **Eprints** | **Bepress** | | **Dspace** | **Eprints** | **Bepress** | | **Dspace** | **Eprints** | **Bepress** |
| UK | 51 | 120 | 4 | Japan | 101 | 3 | 0 | Brazil | 116 | 2 | 0 |
| Germany | 26 | 27 | 0 | Turkey | 129 | 5 | 0 | Columbia | 114 | 3 | 2 |
| Spain | 111 | 5 | 1 | India | 72 | 38 | 1 | Argentina | 35 | 7 | 0 |
| France | 10 | 12 | 0 | Taiwan | 75 | 0 | 0 | Peru | 138 | 0 | 0 |
| Italy | 38 | 39 | 0 | Indonesia | 20 | 129 | 0 | Ecuador | 28 | 0 | 0 |
| Poland | 19 | 5 | 0 | China | 87 | 0 | 0 | Chile | 13 | 0 | 0 |
| Ukraine | 98 | 11 | 0 | Korea | 51 | 0 | 0 | Venezuela | 9 | 1 | 0 |
| Norway | 52 | 0 | 0 | Malaysia | 5 | 30 | 0 | Bolivia | 0 | 0 | 0 |
| Portugal | 46 | 1 | 0 | Thailand | 12 | 0 | 0 | Uruguay | 4 | 0 | 0 |
| Sweden | 8 | 8 | 1 | Sri Lanka | 1 | 0 | 0 | **Africa** | **Dspace** | **Eprints** | **Bepress** |
| Greece | 22 | 4 | 0 | Bangladesh | 7 | 0 | 0 | South Africa | 39 | 2 | 0 |
| Hungary | 11 | 28 | 0 | Iran | 3 | 11 | 0 | Kenya | 25 | 1 | 1 |

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|---|---|---|---|---|---|---|---|---|---|---|
| Netherlands | 11 | 4 | 0 | Saudi Arabia | 5 | 1 | 0 | Nigeria | 13 | 3 | 1 |
| Russia | 28 | 6 | 0 | Philippines | 8 | 3 | 1 | Algeria | 10 | 1 | 0 |
| Belgium | 8 | 1 | 0 | Singapore | 3 | 0 | 1 | Tanzania | 6 | 1 | 1 |
| Belarus | 28 | 0 | 0 | Hong Kong | 4 | 0 | 3 | Zimbabwe | 9 | 2 | 0 |
| Ireland | 11 | 8 | 3 | Kazakhstan | 7 | 0 | 0 | Sudan | 11 | 0 | 0 |
| Croatia | 0 | 5 | 0 | Georgia | 1 | 0 | 0 | Egypt | 3 | 1 | 1 |
| Switzerland | 4 | 6 | 0 | Kyrgyzstan | 4 | 0 | 0 | Ghana | 6 | 0 | 0 |
| Czech Rep. | 12 | 1 | 0 | Azerbaijan | 4 | 0 | 0 | Uganda | 7 | 0 | 0 |
| Austria | 1 | 9 | 0 | Iraq | 0 | 2 | 0 | Senegal | 1 | 0 | 0 |
| Finland | 11 | 1 | 0 | Armenia | 0 | 2 | 0 | Rwanda | 1 | 0 | 0 |
| Denmark | 2 | 5 | 0 | Palestinian | 6 | 0 | 0 | Namibia | 2 | 0 | 0 |
| Lithuania | 8 | 0 | 0 | Qatar | 1 | 0 | 0 | Morocco | 4 | 0 | 0 |
| Serbia | 35 | 1 | 0 | Lebanon | 2 | 0 | 0 | Ethiopia | 2 | 0 | 0 |

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|---|---|---|---|---|---|---|---|---|---|---|---|
| Bulgaria | 7 | 2 | 0 | Nepal | 0 | 0 | 0 | Malawi | 1 | 0 | 0 |
| Moldova | 15 | 0 | 0 | Pakistan | 2 | 1 | 2 | Botswana | 3 | 0 | 0 |
| Estonia | 2 | 1 | 0 | Afghanistan | 0 | 0 | 0 | Mozambique | 2 | 0 | 0 |
| Cyprus | 5 | 1 | 0 | Syria | 0 | 1 | 0 | Lesotho | 1 | 0 | 0 |
| Luxembourg | 1 | 0 | 0 | Samoa | 1 | 0 | 0 | Cameroon | 0 | 1 | 0 |
| Iceland | 1 | 0 | 0 | Polynesia | 0 | 0 | 0 | Tunisia | 1 | 1 | 0 |
| Slovenia | 1 | 3 | 0 | Israel | 0 | 1 | 0 | Libya | 2 | 0 | 0 |
| Latvia | 3 | 1 | 0 | UAE | **1** | 0 | 1 | Somalia | **0** | 1 | 0 |
| Macedonia | 0 | 2 | 0 | **North America** | **Dspace** | **Eprints** | **Bepress** | **Australia** | **Dspace** | **Eprints** | **Bepress** |
| Romania | 10 | 1 | 0 | United States | 165 | 62 | 441 | Australia | 14 | 10 | 14 |
| Albania | 1 | 0 | 0 | Canada | 39 | 25 | 10 | New Zealand | 13 | 3 | 1 |
| Malta | 1 | 0 | 0 | Mexico | 25 | 2 | 1 | **Central America** | **Dspace** | **EPrints** | **Bepress** |
| Bosnia Herzegovi | 0 | 1 | 0 | Panama | 3 | 1 | 0 | EI Salvador | 8 | 2 | 0 |

| | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| na | | | | | | | | | | |
| French Guayana | 0 | 0 | 0 | Costa Rica | 8 | 0 | 0 | Costa Rica | 8 | 0 | 0 |
| Martinique | 0 | 0 | 0 | **Caribbean** | **Dspace** | **Eprints** | **Bepress** | Honduras | 1 | 0 | 0 |
| **Oceania** | **Dspace** | **Eprints** | **Bepress** | Cuba | 9 | 1 | 0 | Nicaragua | 1 | 3 | 0 |
| Fiji | 0 | 1 | 0 | Dominican Rep. | 4 | 0 | 0 | | | | |
| New Caledonia | 0 | 0 | 0 | Jamaica | 3 | 0 | 0 | | | | |
| | | | | Puerto Rico | 1 | 0 | 0 | | | | |
| | | | | Guadeloupe | 0 | 0 | 0 | | | | |

**Table 4: Country wise usage of DSpace software and percentage of usage**

| S. No | Continent | Country | OARs ROAR | ROAR Dspace | % in Dspace |
|---|---|---|---|---|---|
| 1 | North America | United States | 895 | 165 | 18.43% |
| 2 | South America | Peru | 161 | 138 | 85.71% |
| 3 | Asia | Turkey | 164 | 129 | 73.71% |

Table 4 portrays the top three countries-wise usages of Dspace software in the ROAR database, the first and most number to access 165 (18.43%) DSpace software with 895 repositories in the United States of North America by ROAR and second place used in raising numbers to access 138(85.71%) DSpace software with 161 repositories in the Peru of South America by ROAR. A third level used from ROAR number to access 129( 73.71% ) DSpace software with 164 repositories in the Turkey from Asian continent.

**Table 5: Country wise usage of Eprints software and percentage of usage**

| S.No | Continent | Country | OARs ROAR | ROAR Eprints | % in EPRINTS |
|---|---|---|---|---|---|
| 1 | Asia | Indonesia | 175 | 129 | 72.47% |
| 2 | Europe | United Kingdom | 262 | 120 | 45.80% |
| 3 | North America | United States | 895 | 62 | 18.10% |

Table 5 portrays the top three countries-wise usages of Eprints software in the ROAR database, the first and most number to access 129 (72.47%) Eprints software with 175 repositories in the Indonesia of Asia by ROAR and second place used in raising numbers to access 120(45.80%) Eprints software with 262 repositories in the United Kingdom of Europe by ROAR. A third level used from ROAR number

to access 62( 18.10% ) Eprints software with 895 repositories in the United States from North American continent.

**Table 6: Country wise usage of Bepress software and percentage of usage**

| S. No | Continent | Country | OARs ROAR | ROAR Bepress | % in Bepress |
|---|---|---|---|---|---|
| 1 | North America | United States | 895 | 441 | 49.27% |
| 2 | North America | Canada | 97 | 10 | 10.30% |
| 3 | Europe | United Kingdom | 262 | 4 | 1.52% |

Table 6 portrays the top three countries-wise usages of Bepress software in the ROAR database, the first and most number to access 441 (49.27%) Bepress software with 895 repositories in the United States of North America by ROAR and second place used in raising numbers to access 10(10.30%) Bepress software with 97 repositories in the Canada of North America by ROAR. A third level used from ROAR number to access 4(1.52%) Bepress software with 262 repositories in the United Kingdom from European continent.

## 5. CONCLUSION

Although findings of these studies reveal a comparison study between Dspace, Eprints and Bepress softwares in ROAR databases, it is noted that the top 3 countries for the use of DSpace, Eprints and Bepress software is the same in ROAR databases. According to table 4, 5, 6 among 124 countries taken in this study, the top 3 countries that majorly use DSpace, Eprints and Bepress software are first place to United States (18.43%) DSpace in ROAR, Indonesia (72.47%) Epress in ROAR, and Unites States (49.27%) Bepress in ROAR. At second place to Peru (85.71%) DSpace in ROAR, United Kingdom (45.80%) Eprints in ROAR, and Canada (10.30%) Bepress in ROAR. The third place to Turkey (73.71%) DSpace in ROAR, United States (18.10%) Epress in ROAR, and United Kingdom (1.52%) Bepress in ROAR. As per these top 3 countries Peru (85.71%) is the highest number of percentage accessed through Dspace in ROAR and next (72.47%) is the largest number of percentage accessed through Eprints in ROAR.

# THEME 7

# Digital Libraries, IRs & Application of ICT

# Digital Library Services During The COVID 19 Pandemic: A Case Study Of Bangalore University Library

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***Abstracts:*** *The purpose of this case study to known the performance of an academic library in the Bangalore University Library during the period of 2020 and 2021(COVID-19) pandemic. The study is conducted based on data collected from the usage statistics reports of online databases, e-news papers and magazines archives to evaluate and assess library performance in managerial activities, collection development, usage of digital resources, reference services and information literacy activities. The study highlights the significant initiatives taken by the libraries which can be followed by others to meet the post lockdown needs the services. The research has a mixed methodology of qualitative and quantitative method of documentary review and statistical analysis of data software and other services from the library. The result implemented more to provide a rapid response and that they can later be improved to have comprehensive framework for improving quality in the remote access library services.*

**Keywords***: Library Services, Bangalore University Library, COVID-19, Academic Library*

## Introduction:

Due to COVID-19 pandemic, the world has been going through an unprecedented turbulence in all walks of life including the education sector and libraries.

The primary purposes of higher education institutions are related with teaching, and research with the strong library system and which is witnessing tremendous changes in the medium, mechanism and manifestations. The digital resources are now a part of active library usage due to emerging technologies. The digital resources have altered the ways of users' learning and conducting the research activities. The incorporation, of digital books is outcome of space crunch and moving towards the smart options. To support the adaptive learners in the university environment, the library creates new ways and multiple channels of discovery for the students and research scholars. In Covid-19 the teaching of learning environment was expected to change from traditional to blended learning and the libraries will have to gear up to meet these challenges.

The purpose of this study to focus on its attention of the available resources accessing information from Bangalore university library in times COVID-19 as an pandemic.

## Bangalore University Library

Bangalore University Library came into existence in the year 1966 with about 50,000 books and several bound volumes of periodicals of the Central College Library affiliated to Mysore University, Mysore. Prof. S. Sadashiva Murthy and Prof. K. S Deshpande were the founding pillars of this library.

The present Library Building with total floor area of 15513sq ft, is built on star modular structure which enables each sections to function independently. The Library was shifted to this premises in the year 1975. The originally it was planned for seven wings. The library has collection of 3,80,000 Lakhs Books, 200 current periodicals, 5000 theses and dissertations. Apart from theses, the university library is also having quite a good number of documents in non printi. e e-books 50,000+ from university subscription and having access from e-shodhsindhu resources around 7,900+, 8 databases are available in the libraries.

## Objective of Study:

The main objective of the study are what kind of library services are provided during the lockdown period

1. To know the status of the library services during the COVID -19 Pandemic
2. To analyse the digital library services that Bangalore University Library were
offering from home to support e-learning;
3. To find out the usage reports of online resources available in the library;
4. To examine opportunities to university library to their operations and services

due to the challenges posed by COVID-19.

## Methodology

The article is based upon Rapid Review method, as defined rapid reviews "are literature reviews that use methods to accelerate or streamline traditional (systematic review) processes in order to meet the needs and timelines of the end-users" as stated [1] by Ganann, Ciliska, Thomas (2010).The focus and conceptualization of the research topic here is taken with the input that "rapid reviews are a form of evidence synthesis that may provide more timely information for decision-making compared with standard systematic reviews.

## Usage of digital resources:

Digital resources are electronic and online resources accessible by the users through the Internet at any time, at any where and any location. The resources include electronic books, e-journals, e-theses and dissertations, multimedia, learning tools and websites. The usage of these resources are may be includes after accessing digital resources such as searching, viewing, downloading, printing, generating reports,

## E-Resources from Shodhsindhu.

The Information and Library Network Centre (INFLIBNET) is an interuniversity centre of University Grant Commission has played in a major role in e-resources to institutes of higher education in India. In 2003 the UGC-INFONET Digital Library consortium was launched the president of India to promote information access for the universities.

Later the Ministry of HRD based on the recommendation of an Expert Committee merged with the three consortia initiatives of UGC they are UGC-INFONET, NLIST, INDEST-AICTE to form e-shodh Sindhu (ESS) which provides current as well as archival access to more than 10,000 core and peer reviewed journals and a number of bibliographic citation and databases in different disciplines.

The usage statistics portal for e-resources from INFLIBNET centre for monitoring the usage statistics of various e-resources made accessible for the period of 2021 pertaining to Bangalore University, Bangalore. For this study, to know the preference of theses platforms by the users of Bangalore University and to analyse the usage of the e-journals by Bangalore University an attempt was made to know the various platforms offering the e-resources through ess for the year 2021 during the covid 19 lockdown period.

The table shows that there are 12 publishers from e-journals were accessible through eSS. The gives for the 12 months of year 2021 usage of theses e-journals. In this period users are using publishers in springer link downloaded the articles 6,565 followed by databases of Web of Science 3,572. The Last 2 years this is one of the best usage of e-journals in our library.

**Table -1: Platforms offering e-resources and their usage**

| Name of the Publishers | Jan | Feb | Mar | Apr | May | Jun | Jul | Aug | Sep | Oct | Nov | Dec | YTD |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **American Chemical Society** | 197 | 223 | 385 | 86 | 21 | 33 | 204 | 246 | 212 | 171 | 350 | | 2128 |
| **AIP** | - | - | - | - | - | - | - | - | - | - | - | - | - |
| **Annual Reviews** | 5 | 7 | 77 | 2 | - | 5 | 22 | 20 | 16 | 10 | 3 | - | 101 |
| **APS** | 71 | 1 | 1 | - | 1 | 11 | 9 | 7 | 39 | 25 | 12 | - | 177 |
| **JSTOR** | 186 | 201 | 494 | 130 | 81 | 131 | 294 | 237 | 455 | 169 | 152 | - | 2430 |
| **MathSci Net** | 954 | 47 | 132 | 174 | 56 | 51 | 98 | 199 | 26 | 60 | 86 | - | 1023 |
| **Nature** | 35 | 24 | 62 | 33 | 33 | 18 | 53 | 54 | 106 | 41 | 69 | - | 528 |
| **Oxford University** | 63 | 48 | 67 | 25 | 2 | 19 | 81 | 58 | 70 | 34 | 39 | - | 506 |
| **Project Muse** | 3 | 2 | 7 | 1 | 6 | 3 | 13 | 13 | 21 | 65 | 114 | - | 248 |
| **Springer Link** | 632 | 636 | 548 | 394 | 511 | 710 | 668 | 676 | 674 | 676 | 440 | - | 6565 |
| **Taylor and Francis** | 227 | 122 | 181 | 139 | 48 | 133 | 207 | 233 | 237 | 176 | 164 | - | 1867 |
| **Web of Science** | 331 | 420 | 1204 | 196 | 529 | 352 | 216 | 28 | 203 | 40 | 43 | - | 3572 |

## Shodhganga

Electronic theses and dissertations (ETDs) are highly valuable resources for research and development in the academic institutions. The UGC Notification (Minimum Standards & Procedure for Award of M.Phil. / Ph.D Degree, Regulation, 2009) dated 1st June 2009 mandates submission of electronic version of theses and dissertations by the researchers in all universities. The aim of shodhgangato facilitate open access to Indian theses and dissertations to the academic community

world-wide. As per the Regulation, the responsibility of hosting, maintaining and making the digital repository of Indian Electronic Theses and Dissertation (called "Shodhganga") is accessible to all institutions and universities by the INFLIBNET Centre. The main objective of Shodhganga@INFLIBNET Centre is to provide a platform for research students to deposit their Ph.D. theses and make it available to the entire scholarly community in an open access.(http://shodhganga.inflibnet.ac.in/).

At present the library having the collection of theses 4000+ in different subjects like Faculty of Science, social science, Languages and Arts. We have uploaded the Ph.D theses around 1900+ in difference subjects along with the Constituent Colleges are UCVE, ULC, UCPE. During the period of covid 19, we have uploaded the 1000+ theses into shodhganga. It is available theses for download in the period of 2018 to 2021 for all the subjects. But for the past 80 and 90' series of the theses need to be scanning around 2,000+ to be upload for shodhganga.

## Virtual Reference Services Communication Technology Tools

Electronic mail is a communication channel of transferring messages from one electronic device to another usually via a network. The e-mail technology is one of the most popular means of communications over the worldwide information superhighway. Various studies have demonstrated that academic libraries are considerably implementing and using e-mail reference service as one type of virtual reference services (Anna & Srirahayu, 2020). Instant messaging (IM) is a type of online communication which offers real time text transmission over the internet. Academic libraries in developing countries can leverage on the power of various IM technology tools to provide virtual reference services.

Bangalore University Library initiates the whaptsup messages and created the group of BUL NewsCafe for students, Research Scholars, faculty members and staffs during the covid 19. In Newscafe we are sending daily newspapers of Kannada and English and some of the newspaper subscribed from the Hindu and the New Indian Express and other etc. It is also created the BUL-Competitive Exams and other resources to sending the related to employement news, KAS and IAS coaching centre etc.

## Institutional repositories

Bangalore University Library has initiative the e-prints which collects, preserves and distributes scholarly output of research and innovation activities by its faculties, research scholars and students. Institution Repositories is an open sources step-up in December 2015, the aims of its cover scholarly publications covering journal articles, conference papers, books, book reviews, presentations, reports and patents

of our faculty members and research scholars. The preservation of their scholarly publications provide easy access to theses publications worldwide and to improve the impact of their research. E-prints@bangaloreUniversity can be accessed by anybody, submission of documents to this archive is limited to the BU research community. This can browse publications by year wise, subject wise and division of the varsity, author and document type. The users can freely download and use the documents of them are directly accessible and full-texts downloadable. Currently the publication papers has a total of 7150 with over 4,07,971 total downloads as of February 24, 2022.




**Fig No.-1 Usage statistics of e-prints for the year Mar 2020 to Mar 2021**

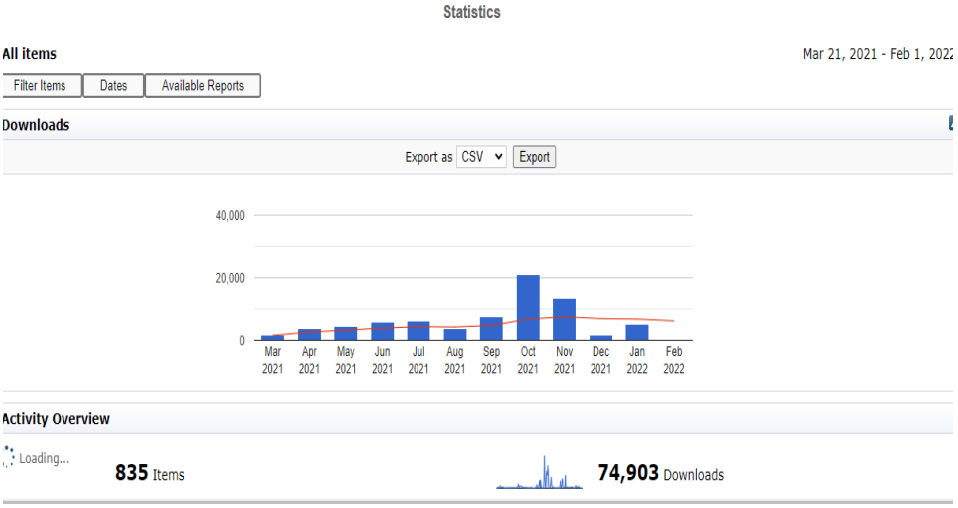



**Fig No. 2 Usage statistics of e-prints for the year Mar 2021 to Feb 2022**

## Remote access

Remote access for library collections are the result of the growth of education programs in higher education. With the increased demand for online education, students needed a way to access library collections without coming to campus. As technology improved, the ability for students to use a library's database without coming to a physical campus became a reality. Through such technologies as virtual private networks VPN and EZproxy, students could use their ID and password to gain access to library collections. As a result, students now have the ability to search a library's catalog or find an article in database without coming to the campus, anytime of the day or night. Remote access technologies provide students, faculty and librarians with the opportunity to meet user needs regardless of whether or not they are on campus.

The main aim of academic library is to enhance and strengthen the teaching, learning and research process by installing seamless document/information delivery system and around the country. All libraries of higher education system have been working hard to provide services and access to collections to the users who have been displaced during COVID 19.

Knimbusm library is a cloud based platform that enables a complete digital transformation of any Academic or Government Institutional Library. This platform is single sing on, modern interface and easy navigation enables users to access thousands of institutional e Resources from anywhere, anytime and any location. In this mLibrary provides deep integration with MS Teams, Koha, OPAC and Software like Anti Plagiarism. Users can access the entire collection of subscribed E-Resources, Open Access Content and Institutional documents through their desktop or mobile app. The University subscribe the knimbus platform for accessing of our eresources from shodhshindu, and subscribed e-journals and databases, subscribed e-books and uploaded the newspapers of kannada and English since 2 years back.

https://bangaloreuniversity.knimbus.com/user#/home

## Conclusion:

To improvement of research in higher education and libraries have been providing comprehensive learning towards emerging technologies and changing information facets such e-journals, e-databases, e-books, electronic archives, institutional repositories, e-newspapers, question paper banks, open access (OA) resources and freely available web based resources. The users needs to be the different approaches providing information redefined according to the situation and requirement of rapidly changing scenario.

This future study to known the user centered approach and should start with an analysis phase aimed to identifying users needs and usage scenarios. The content of usage statistics and services to be chosen based on the analysis and involve representative groups of users. During the period of COVID 19 who far the users uses the services of Bangalore university library and their needs better improvement of the library services.

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# Digital Library and Digital Information Archive: An Overview

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## Abstract:

*The term digital libraries refer to a new way of carrying out the functions of libraries containing new types of electronic resources , new approaches to acquisition, especially more access to other library's collection and sharing it. It also undertakes new methods of storage and preservation, new approaches to classification and cataloging. Intensive use of electronic system and network are making dramatic shifts in intellectual, organizational and electronic practices. In a digital library environment, publication need not owned to be readily accessible. Many sources of information can be made available to the user community that could not be available in the library, then where to acquires the sources or purchase and store the same. An electronic collection can be more flexible and dynamic and also learning wider variety, choice of selecting only that part of the document that is relevant and the whole sources need not be acquired. Location of all items in the machine readable form is quicker than that of the conventional printed shelf collection. In digital environment only digital information is disseminated and most of the information is obtained by remote access. Much of this information is less permanent in nature. The data or information may be different types. To organize the data or information, we require classification as well as cataloguing practice and it calls for an appropriate data model for organizing data with standard point. Specialized technologies are needed for compressing as well as for organizing information. The opportunities and challenges in the digital Library environment are described.*

**Key words:** *Digital library, Library, Information, Digital Information, Archive.*

## Introduction

The recent decades we have witnessed tremendous advance changes in information technology and its application. The latest technologies offer cheaper price computers processing power, mass storage, inexpensive access to high speed networks and retrieval devices. Which gives us the ability to create, manipulate, store and transfer large quantities of information in digital format low cost, electronic publishing and resources sharing activities have become very easy and convenient today. The technologies changes have led to create and develop digital

libraries. Digital Libraries basically store of materials in electronic format and manipulate large collection of those materials effectively. The key technological issue is how to search and display the desired and selections from and access electronic collections. The main focus for digital libraries should be on issues of access cost and digitization technology and how to develop the necessary infrastructure for effective mass manipulation of the information in the network.

## Digital Library

Digital libraries are defined in many ways, encompassing both analog sources made available and newly created digital content. The future of digital library history will be determined not by the technology involved but by the ideology. If the prevailing definition of a digital library is an organized searchable collection in digital format, then the future of digital libraries will reflect a move towards integrated service functions and collection development and management of similar to the traditional library organization.

A digital library is a machine readable representation of resources, which might be found in a library together with organizing information intended to help users find specific information. A digital library service is an assembling of digital storage and communicating machinery together with the software needed to repeat, emulate and extend the services provided by conventional libraries based on paper and other material means of collecting, storing, cataloguing, finding and disseminating information. Digital libraries are organized collections of digital information. They combine the structuring and gathering of information, which libraries and archives have always done with the digital representation. The collections of digital sources including text, video and audio, at the same time access and retrieval of the sources, and for selection, organization and maintenance of these collections are vary from printed to digital forms.

## Digital Resources:

For several decades, information technology has been an important tool for meeting the libraries objectives. However growth in use of the internet as a publication medium and as a mechanism for service delivery has presented significant new challenges and opportunities. The increasing amount of material published only in digital form, material referred to as being 'born digital', and the emergence of digitization as a cost effective means of enhancing access to traditional library materials. In recent years the library has given increased attention to collecting digital information resources, as part of its statutory obligation to collect, preserve and make available library resources. This includes both born digital and internet accessible sources captured for archiving and preservation and

curtain of "digital surrogates" of physical objects in the library's collection through scanning or digitization. By its nature, digital resources development requires extensive use of technological resources. In the early days of digital library resources, when collections were typically small and experimental, a wide variety of hardware and software was utilized. Today the leading digital library developers are putting substantial collections online. As digital libraries scale in size and functionality, it is critical for the underlying technology platform to deliver the performance and reliability required.

**Digital preservation:**

The preservation of digital information can be seen as one of the greatest challenges for the library and information professionals. It is easy to get caught-up in the general enthusiasm for digital libraries but more consideration needs to be given to the problem of making this information available to future generations. Libraries have traditionally understood at least one of their roles as the preservation of information for future use. We do not know today somewhat sounded like on the keyboard, nor how the ordinary person performed as an actor. What will future generations know of our history, we thought that when printing was discovered and libraries were created the woodpulp paper used in most books, again threatened the loss of information. But digital technology seemed to come to the rescue, allowing indefinite storage without loss. Now we find that digital information too has its dark side and although it can be kept without loss it cannot be help without cost. The vast amount of information produced in the world is now for a large part digital and include a wide variety of materials text, databases, audio, film and images. Today, information technologies that are increasingly powerful and easy to use, especially like those that support the World Wide Web, have unleashed the production and distribution of digital information. Such information is penetrating and transforming nearly every aspect of our culture. If we are effectively to preserve for future generations the portion of this rapidly expanding corpus of information is digital form that represents over cultural record. We need to understand the costs of doing so and we need to commit ourselves technically, legally, economically and organizationally to the full dimensions of the task.

In the face of rapid technological obsolescence and to overcome the problem of media fragility, archivists have adopted the technique of refreshing digital information by copying it onto new media. Copying form medium to other medium have a separate technical issues. However it also suffers limitations as a means of digital preservation.

In today's situation digital information is produced in highly varying degrees of dependence on particular hardware and software. Moreover, it is costly

and difficult for vendors to assure that this products are either "backwardly compatible" with previous versions or that they can interoperate with previous versions or that they can interoperate with competing products. A better and more general concept to describe these options is migration is the periodic transfer of digital materials from one hardware / software configuration to another or from one generation of computer technologies to a subsequent generation. The purpose of migration is to presume to integrity of digital object and to retain the ability for clients to retrieve, display and otherwise use them in the face of constantly changing technologies.

**Archival of digital collections**

The primary goal of a library is to collect, preserve and give access to recorded knowledge in all documentary forms for the benefit of all engaged in research and learning or with other information needs.

The digital age creates new delivery and access alternative of library as well as new preservation challenges. In turn the expectations of library users are changing. As people discover information resources online at their computer, Workstations they also want access to the contents of libraries in that some online environment.

Digital libraries and archives play a critical role is organizing preserving and promoting access to the various information resources. In the relatively stable world and printed hand written and mechanically reproduced information repositories managed to preserve a rich array of scholarly communications.

However, libraries and archive face technical, legal and organizational challenges in responding to the new demands of digital preservation. Digital resources are especially vulnerable to loss and destruction, therefore they are stored on fragile magnetic and optical media that deteriorate rapidly and that can fail suddenly from exposure to heat, humidity, airborne contaminates or faulty reading and writing devices, even if the medias are preserved intact. Digital materials become unreadable if the playback devices necessary to retrieve information from the media become obsolete or if the software that translates digital information from machine –to-human-readable form is no longer available.

Archives have been involved in great changes with the rise of modern information technology to automate archives management, especially through the application of computers for the arrangement and description of records. The result is faster and more accurate arrangement and description, as well as more efficient information retrieval.

The scarcity of economic resources and the lack of proper archival policies are the main problems. The situation and archives in countries have archives at the national level together with archival legislation which defines and establishes general policies and standards for the presentation of the archival heritage, many archives use microfilming technology to preserve records and a few have now started to implement and develop computerized system to help with the arrangement and description of archival resources.

However, there are less positive aspects are seen in the process of archival they are lack of specialized human resources and almost non – existent professional archival education and training. In the absence of qualified personal the archival are experiencing difficulties in tackling the problems of records and archives management. Another major problem in the uncertain financial background – often archives institutions have very limited budgets which do not guarantee them adequate resources for the implementation of a proper archives policy.

Almost everywhere archives are esteemed only for their heritage value, the role documents play in managing the countries affairs and assisting the decision – making process is forgather. As record – keeping practices are not changing, there is no incentive to draft new legislation, standardization is everywhere less developed is the archives sector – than is others information sciences

The development of the internet and the World Wide Web is bringing unprecedented changes to the archival enterprises. In describing and making available holding, archivists have long developed finding acts, printed them and distributed them in person or by mail. Records have met often been used in research rooms. Sometimes records are used through photocopies ordered after consultation with an archivist, sometimes records are used on microform ordered by an archivist and accompanied by some form of description. The general pattern, however, has been of direct communication, one –to – one between archivist and user. With the archivist able to answer questions, clarify the structure of the holding and in general mediate and research use.

The World Wide Web and the internet have changed that the new pattern is unmediated communication in multiples. Archivists place descriptions on a web site, users from all over the world have simultaneous access without intervention of the archivist. Copies and documents placed on the website may be need in random sequences over the course of the research. These four great engineers of change are reflected in the work of the archival profession.

## Conclusion:

The vast amount of information produced in the world as now for a large part digital. The task of managing the ever increasing digital objects throughout their life cycle and to preserve them in perpetuity becomes more and more complex therefore of they are fragile, volatile and ephemeral in nature a wide verity of digital collections have emerged on the Internal. While digital collections may differ in content or structure. They all share one commonality – the need for metadata. Frequently described as 'data about data', metadata facilitates the discovery and retrieval of information, it provides for resources presentation and navigation and it contains the informational needed to preserve digital data file. Metadata is a actual component of all digital collections. Therefore the archiving of digital information are more significant in the scholarly communication chain.

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# Promotion And Marketing of Qr Enabled Etd Service: A Study on Bharathidasan University Theses and Dissertations Collections in Shodhganga

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## Abstract
*This paper aims to deduce QR code technology that would enable accessing Electronic Theses and Dissertations in single point access. The objective of this paper is to find an easy method to access Electronic Theses and Dissertations, promotion of Shodhganga database, marketing of QR enabled information retrieval services among user community and one-point access for theses titles list of Bharathidasan University Library collections. The very purpose of the study is to enable the users to have a snap of QR through their mobile and can access individual theses data in the Shodhganga rather searching in the database. The study also make aware physical users of the library on ETD and thus saved their time money and material for photocopying and so on.*

**Keywords**: *Promotion of QR Services in Libraries, Marketing of LIS, ETD Shodhganga*,

## Introduction:

As S.R. Ranganathan rightly said, "Library is a growing organism". As the law suggests, when compared to the last century, this century has witnessed unstoppable range of 'information explosion'. Information is being generated across the world at the rate of $1 million data per minute (as per statistics referred in OCT 2021). It is estimated that by 2025, the people would be transacting 75 billion 'Internet-of-Things' (IoT) devices in the world and by 2030, every nine out of 10 people aged six and above would be digitally active in generating of data. The antecedents' Thesis and Dissertations stands as the outcome of scholarly communication for the future young research scholars. Being a repository itself, the library is changing paradigm from manual atmosphere to hybrid and from hybrid to

digital ambience so as to hook its users with latest knowledge updated. Furthermore, it also adapts to the recent tendencies of users to meet their requirements in Research and Development such supporting E-Content Development, Audio-Visual materials, E-books, e-magazines, e-journal and so forth.

## Shodhganga: A Reservoir of Indian ETDs

**Christian R Weisser and Janice R. Walker (1997)** define ETDs as "theses and dissertations submitted, archived or accessed primarily in electronic formats". They also extend to define that "those documents that includes traditional word-processed, documents made available in Print Document Format (PDF), as well as less traditional-hypertext and multimedia formats published electronically on CD-ROM or on the World Wide Web".




"Shodhganga" is the name coined by the INFLIBNET Centre for the digital repository of Indian Electronic Theses and Dissertations. "Shodh" comes from Sanskrit and means 'research' while "Ganga" is the largest, 'longest and holiest of rivers'. As per the UGC Notification "Minimum Standards & Procedure for Award of M.Phil. / Ph.D. Degree, Regulation, 2009 Amendment made on 2016" dated 5th May 2016, researchers in universities are required to submit an electronic version of their theses and dissertations, so that the academic community at large has access to Indian theses and dissertations. According to the Regulation, it is the responsibility of the INFLIBNET Centre to host, maintain and make Thesis and Dissertation Digital Repository (called "Shodhganga"), accessible to all institutions and universities.

## QR Enabled ETD Information Retrieval:

The retrieval of any kind of information from its sources in conjunction with an individual or query is known as Information Retrieval. IR in mobile devices is a fast-growing area that has received considerable attention in the last ten years. Many researchers have begun to explore how to enhance their IR capabilities by using some of the features of mobile devices. The library has e-versions of all

physical collections of Theses and Dissertations available on the Shodhganga website, while books have no e-version or a limited one.



There is no separate equipment needed to use QR codes. They are also accessible by smart phones. Researchers have quicker access to information than with other dimensional codes. One app and one-click can provide you with all the information you need. While destroyed barcodes are difficult to read, QR codes can get information despite these measures.

## Expected Outcomes:

- To discover an easy method of retrieving ETDs to help researchers access the research information they need during the pandemic.
- Promotion of the Shodhganga National ETD repository among students/ researchers for an increase in citations.
- To create the updated classified list of titles of theses and dissertations of Bharathidasan University Schools from Shodhganga database with QR code.
- To design and disseminate one-point access posters and classified titles list of Theses and Dissertations of Bharathidasan University Schools in University Library Website for wider access.
- To enable physical users to have online access to the respective theses from library shelves.

## Methodology:

The University Central Library is under the process of fixing QR codes into physical theses available in Theses section of Bharathidasan University. Scanning QR codes pasted in manual theses through mobile phones by which, the user can access its e-version document present in the Shodhganga database. The users can access, download, print, and share the document with their associates. A separate software, namely TSC Bar-codes, is installed and used for designing QR-codes.

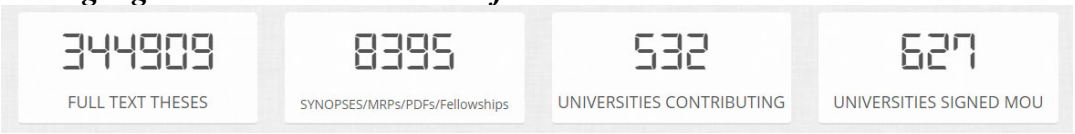
Though the library has taken this initiative for the proliferation of research outcomes, many scholars and students are *unaware* of this repository. Promotion and Marketing of QR enabled ETD servicesamong student and scholar community which would legally and additionally support their research projects and theses.

## Limitations:

- ✓ The study is executed on the theses only available in Shodhganga and physically at Bharathidasan University Library at the time of study.
- ✓ The scope of the collection covers the theses received from university department schools and its affiliated colleges.
- ✓ QR codes are installed only to the manual theses collections available in the University Central Library of Bharathidasan University.

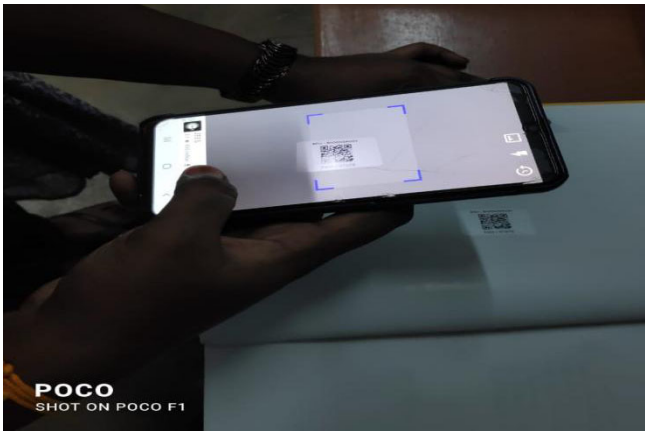
## Implementation and Execution of Work-Plan:

***Shodhganga Database: A Reservoir of ETDs***




Shodhganga is the reservoir of Electronic Theses and Dissertations of Indian Universities and affiliated colleges. The site comprises of University wise Theses and Dissertations collections in Electronic format. It was established in 2011 and recommended by UGC from 2016 onwards. Bharathidasan University has total collection of 6,129 e-Theses and Dissertations from 48 university department schools and its affiliating colleges. Bharathidasan University is in 11$^{th}$ position out of 532 universities contributing in India. As earlier mentioned in the paper, the university collects all the Compact-Disks (CDs) (as per amendment in 2016) holding soft copy of the theses is uploaded at regular interval of time into the shodhganga database.

***Installation of QR codes in manual Theses***




The Bharathidasan University Central Library has a collection of 6000+ physical theses and dissertations available in Theses section. The theses and dissertations are divided in two categories: Arts/Humanities and Sciences, duly classified and maintained by staff-in-charge which is supervised by the section Head.

In the pandemic, accessing theses for sample reading, title checking, supporting materials and other aspects was tough. The government permitted to run the libraries with limited human resources. Accordingly, the

patrons faced issues in their retrieval. The researcher conceived the 'idea' of importing QR codes (owing to the huge popularity in covid-19) in manual theses by connecting them to respective ETDs in Shodhganga database. As per the conception, a samples of 10 theses from varying disciplines were set out for the trial. QR codes were generated using Open Access online freeware QR generator. In the bottom of the code, the registration number of the candidate is mentioned along with the department. If the registration number of the candidate is not available, then, the 6-digit number in the shodhganga database can be substituted in place of registration number. The label is then printed and pasted on two instances: (I) in the bottom of the theses spine and (ii) in the backside of the title page. After examining, the trial was instant success and the library patrons find it fascinating to use. Thus, the QR codes are installed in physical theses available in Theses Section of University Central Library, Bharathidasan University. It is note that QR codes are partially installed and is under installation process.

***Generation of Updated Theses Titles List of Bharathidasan University Schools with QR codes:***

The titles list from varying subject of the theses (under progress) is compiled from Shodhganga and physical collection (available in Theses section) by the scholars in the Department of Library and Information Science, Bharathidasan University, Tiruchirappalli. Every scholar divided the subjects of their choice and exported the titles list from the aforementioned sources, comprising of Serial Number, Date, Title, Research Scholar, Research Supervisor/Guide and QR Code. The list is then fully compiled and dropped out duplicates titles that has been repeated twice. Thus, the list of Titles of Theses according to discipline-wise is generated with QR codes.

***Designing of Flyers and Posters to give One-Point Access to Department ETDs:***







After the successful generation of subject-wise titles list, Posters and Flyers are designed with university credentials, department name, and sinlge-point QR code, scanning which the link directs to department page of ETDs in Shodhganga. The Posters and Flyers for varying departments are designed, and is promoted to the students community, scholar community and faculty members of respective university departments and schools in person. The above methodology has inferred

that user community can readily access their research related information anytime, anywhere with their mobile technology on single-point access. A copy of the same is put on the Theses section bulletin board.

***Special consideration given to the incoming visitors in terms of hands-on approach:***

There are around 200 visitors incoming to the Theses section of University Central Library in a month from affiliated colleges and other regions of the state. Mostly, they come to crosscheck any supporting materials for their research. They browse and retrieve the documents by Subject, Title or name of the researcher/Guide. At times, they would prefer getting photocopies of the papers of thesis.

The incoming visitors to this particular section are accounted with special preference and consideration in terms of information retrieval and trying the best ways to navigate them in providing the right information. As earlier mentioned, the visitors are subjected to come from distanced geographical places and are in want of information immediately. Having said that, the visitor is allowed to browse through the university collections. If he finds his information, the section staff-in-charge directs him to how to get the e-version of document through QR codes with mobile phones and thereby, promoting him about the update in the services. The staff would also ensure to wide-spreads the recent advancement in the service and thereby markets the technology to the research scholars.

***Discipline-wise Theses Titles list for Enhanced Visibility in Library Website:***

The Librarian of University Central Library, Bharathidasan University has witnessed the prosper of Theses Section visibility and its enhanced usage. So, he proposed to compile QR codes along with theses titles list and let that be uploaded in University Library Portal. This way, he added, it gives instant access to document retrieval and thereby, increasing the citation of Bharathidasan University in Shodhganga Database. The list is under construction process and after overall compilation, it would disseminated for user community.

| QR CODE | TITLE | QR CODE |
|---|---|---|
| | A study of occupational stress among the IT professionals in Chennai, Tamilnadu | |
| | A study on employee engagement in dalmia cement factories located in tiruchirappalli district tamil nadu india south | |
| | A Study on Executives Perception on Organization Development Strategies Practised in Tamil Nadu Newsprint Paper Limited TNPL Karur | |
| | A study on knowledge management and its impact on organizational performance in public sector with special reference to Bharat heavy electricals limited, Tiruchirappalli | |
| | A study on mediating effects on purchase decision of bikes in Kancheepuram Dt Tamil Nadu | |
| | A study on mediating effects on service loyalty in grocery retailing in thanjavur district tamilnadu | |
| | A study on mediating effects on service loyalty on healthcare services in tamilnadu india | |

| | | |
|---|---|---|
| | A study on moderating effects of employee outcomes on HR practices and turnover intentions relationship among ICT professionals in India and Canada | |
| | A study on strategic financial performance of public sector banks in india | |
| | Development of Operational Models in Industrial Relations Dynamics through application of Catastrophe Theory | |
| | Dynamics of organizational citizenship behaviour and performance with total quality management and knowledge management as the moderators an empirical study in knowledge intensive service sectors | |
| | Emotional labour as a mediator of the relationship between strategic emotional intelligence and job performance with specific reference to a public sector in india | |
| | Job satisfaction as a mediator of the relationship between strategic emotional intelligence and organizational citizenship behavior amongst faculty in educational institutions | |
| | Study on competitive advantage through information strategies_framework for strategic information systems planning in the Indian context | |

## Outcomes of the study:

As the outcomes of the study, it is inferred that Indian Reservoir of Electronic Theses and Dissertations: SHODHGANGA is highly beneficial to ongoing and upcoming research scholars as it briefs them about the formulation of objective, methodology and estimated results. The incoming scholars from affiliated institutions find it fascinating to use mobile device to single point access the soft copy of physical theses information in the University Central Library through QR code. The staff-in-charge of Theses section promotes the unaware scholars on how to scan QR and access information through mobile technology. The popularity of QR service among post-graduate students and research scholars of in-house university schools and departments gave rise to overwhelming number of Shodhganga database citations.

Apart from that, the scholar has visited in person each schools and departments in the university and promoted the use of shodhganga database through POSTERS and FLYERS. This step has really impacted the staff, scholars and students, especially, in epidemic times, where sources are visible open access. The disciplinary-wise Posters and Fliers are even confined to the departments belonging to affiliated institutions. In addition, the Librarian has also initiated to provide the discipline-wise theses titles list of respective departments in the University Library Website. This way, the library patrons and also overseas users feel convenient to access ETD collections in Shodhganga website.

## Conclusion:

In a gist, the research has deduced that execution of mobile enabled QR code services need spontaneity on a regular basis. QR enabled information retrieval is convenient for remotely accessing through mobile phones and thereby increasing the citation of Shodhganga database. Promotion and Marketing of theses retrieval services to in-house and incoming user community has widened the scope of enhanced usage and more visibility in effective knowledge sharing resources. Thus,

the study has laid foundation to incorporate similar-like technology into disseminating services according to the necessity of the circumstances.

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# “Vidya-Mitra” Hub For Integrated E-Content Development :A New Opportunity During Post COVID

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***Abstract***

*Today we are facing so many challenges of integrating ICT in Education is lack of quality e-content which is very useful in to environment. Today’s we need to encourage e-content production at various level of education in India. Today we need to develop a quality e-content. In this era this paper examines the e-content deposited at “Vidya-Mitra” project. For this stage INFLIBNET Play a very crucial role to develop e-content. The study considered only haw to develop e-content in “Vidya-Mitra” Project. This project is very useful during post-Covid. How to participate in this project.*

*Keywords: - Vidya-Mitra, E-Content, INFLIBNET, contribution for e-content*

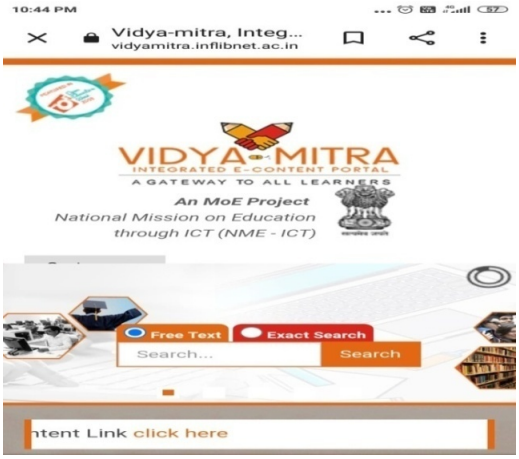
Introduction:-

Today we saw a big explosion of information in this trend every information seekers are confuse witch information are trustable. Less production of creative contents and incorporating innovative information and communication (ICT) for effective dissemination of such contents play a vital role. To develop knowledge base society, integrating ICT at all levels of education. However, even today one of the greatest challenges of integrating ICT in education is lack of quality base e-content. For the upcoming generation i.e Digital Natives, we need to build up a digital leering couture and environment. Mastering ICT skill and utilizing ICT towards creating an improved teaching environment is of most importance to teacher in creating new learning culture e-learning serves this purpose in its various from such as web-based learning. Computer- based learning, mobile-based learning, virtual classrooms, and digital collaboration. This great transformation poses challenge to educators, regarding their basic tenets, to deploy the media in creative and productive ways, as “teacher are the central forces in tapping the learning opportunities created by ICT” (Majumdar, 2004)

**E- Content:-** E-content is very powerful tool of education. It is the latest method of instruction that has attracted attention of learners and teacher of all instruction system. E-content means in the digital form. It is combination of text, audio, Video, images, animation with visual effects. Any digitized content that can facilitate the learning process or learning outcome can be termed as e-content.

**Objective of the study:-**

- **To find out the project wise e-content of "Vidya-Mitra" Database**




Vidya-Mitra (INFLIBNET):-

Vidya-mitra is an online learning portal for all the e-conten project development under the NME-ICT, MHRD, establish in 2014. On this portal, a learner can access materials according to his educational use. The available content is in the from of Audio, Video, Text, Multimedia enriched materials. (Vidya-Mitra,n.d.)

https://vidyamitra.inflibnet.ac.in

National mission on education through Information and Communication and Technology (NMEICT) is an ambitious project undertake by the ministry of Human Resource Development (MHRD), Government of India with a view to seamlessly providing quality education content to all eligible and willing learners in India. It has envisaged content and connectivity as the twin pedals for initiating and accelerating ICT-enabled Higher Education.

There are more than 55 project on e-content under NME-ICT which are develop in various subject disciplines Science, Arts, Engineering, Social Science, etc through various institutes universities and colleges. Vidya-Mitra portal would facilitate search, material including audio, video learning material, textual material, multimedia enriched materials, etc. through a single integrated interface.

**Objectives of "Vidya-Mitra":-**

- Develop an open education repository (OER) consisting for formidable collection of e-content from across all Govt. (MHRD) sponsored e-content projects.

- Enriched metadata for all e-content project.
- Provide access to all e-content through a single platform that facilitates search and browse through a user friendly interface.
- Platform and browser independent access with seamless streaming: and
- Promote usage of e-content amongst students and peers.

"Vidya-Mitra" is one of largest open repository for learning across the globe. It is awarded OER repository Award2018 for open Education excellence by open education consortium. Repository has more than 66,000 Video Content modules.

**Procedure to Contribute for e-content:-**

1What is the procedure to submit the content?

The contributors who are willing to contribute their content can fill- up from available at URL:-https://vidyamitra.inflibnet.ac.in/index.php/contribut_content

2What are the criteria to submit the Content?

The content should be based on the entire course. Plagiarized e-content will not be accepted.

3Which kind of content would be submitted

Contributors can submit documents and contents.

4 what is the benefit to submit the content

Vidya-Mitra is a one stop search portal for all the project developed under NMEICT and the contributors would get an opportunity to populate their work by availing free hosting services on Vidya-Mitra portal. It will also help the content coordinators to increase their footprint and visibility.

5 is there any financial help from INFLIBNET

No there is no provision of financial help or assistance for developing/ hosting content. The content will be hosted on Vidya-Mitra without any financial burden to the contributor.

6 what is nature of content

The nature of content means textual documents, audio-visual materials and additional reading material accompanied with the content.

7 What is e-text

An e-text a self- explanatory textual material on a given topic, lecture, module.

8 whetear reviewer are compulsory

It is mandatory to review the content for enhancing quality of content.

9 mode of sublimation of content

The content can be submitted through various mode depending upon the size of content. If the size is less, it can be shared using Google Drive with the following email ID: content@inflibnet.ac.in if size is high, it is requested to send data in pen drive or portable hard disk.

**Conclusion:-** Indian Higher Education system is encouraging the faculty member to create the e-content for their regular Teaching & Learning. Based on the educators through this project will be helps the students and Faculty Member to indentify the right materials for their teaching& learning. This project encourages the faculty member to contribute more and more on online learning environment. In future same Condition like Covid Vidya-Mitra project is very useful in this situation.

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# An Affirmative Approach of Evaluating Open Access Repositories in India

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## Abstract:

*The aim of the study is to find out the impact of Open Access Repositories (OAR) enlisted in Directory of Open Access Repositories (OpenDOAR) and Registry of Open Access Repositories (ROAR) with a comparative analysis of both the authoritative resources. For this study a total of 35 OARs enlisted in OpenDOAR out of which 24 is also registered in ROAR is selected for analysis by Web analytics tool Nibbler to evaluate the performances of the websites. "Ranking Web of World Repositories" (RWWR) ranking with its' search and retrieval strategies are also taken in consideration for this study.*

*The findings revealed that OpenDOAR and ROAR has their own pros and cons in aggregating data on Open Access Repositories. Although OpenDOAR claims that the listing of repositories in its directory are 'carefully reviewed and processed by a member of our editorial teams' but during this study it was found out that the claim is inaccurate in terms of URL specification, functionality and so on. ROAR registry includes a pool of features out of which some are malfunctional. However, ROAR has certain advantages over OpenDOAR, such as export facility, geographical identifiers (latitude and longitude) and total record count of the OARs.*

*Additional analytics using Nibbler showed that the best performing OAR was 'Knowledge Repository of Indian Institute of Horticultural Research' among the 35 studied and INFLIBNET is at top of the popularity rank.*

*This paper may help the administrators of the websites to improve the performance of the repositories and tries to draw the attention of the users to the advantages and drawbacks of OpenDOAR and ROAR.*

**Keywords**: *Open Access Repositories (OARs), OpenDOAR, ROAR, Impact Analysis, Web Analytics Tools*

**Introduction:** Open Access Repositories (OARs) act as a gateway of information to researchers as it maximizes the visibility and impact of research outputs of different institutions as well as organizations[1]. Directory of Open Access Repositories (OpenDOAR) and Registry of Open Access Repositories (ROAR) are seemingly the most used directories of open access resources. OpenDOAR provides listing of the repositories using quality assurance parameters[2]. It is maintained by SHERPA Services, based at the Centre for Research Communications at the *University of Nottingham*[2.] ROAR is a searchable database with direct user submission. ROAR indexes the repository growth, contents, geographical location etc[3].

This study aims at finding the impact of the Open Access Repositories enlisted in OpenDOAR. Impact Analysis[11] is used in Computer Science, we preferred to implement impact analysis on Open Access Repositories (OAR) as OpenDOAR and ROAR those have most of the times being hyped by the authors in numerous literally warrants without measuring its true impact**.**

The **"Ranking Web of World Repositories" (RWWR)** is an initiative of ranking websites of world repositories operated by 'Cybermetrics Lab', a research group under CSIC, Spain (CSIC: Consejo Superior deInvestigaciones). The Cybermetrics Lab includes Quantitative Studies on scholarly activity along with scientific communication, resources and impact of Open Access Initiatives. The webometric ranking of the world repositories is based on some indicators such as the visibility of the repositories on the web, the transparency about the resources available, evaluation of the impact of the repositories and analysis of the usage of information through web data mining of log files[4].

Being the selective authoritative sources, both OpenDOAR and ROAR function as indicative services for the academic community. As the pivotal tertiary sources of information, these services warrant to administrative audit for their effectivity of the content they are holding. Hence, this study tries to a) evaluate the efficacy of the data on Open Access Repositories enlisted both in OpenDOAR and ROAR, b) a webometric measure of the performance and functionality of the OA repositories using an analytics tool and furthermore, the study evaluates the searching and retrieval facilities of 'Ranking Web of World repositories' collection.

**Methodology:**

The prime objective of the study is to analyze the Open Access Repositories in India registered in OpenDOAR and ROAR. The study is constituted with three parts,

- First part is the **web survey and analysis** of the OpenDOAR (**https://v2.sherpa.ac.uk/opendoar/search.html**) and ROAR (**http://roar.eprints.org/cgi/search/advanced**) and then comparing the data available in OpenDOAR and ROAR.

  The total number of OARs in OpenDOAR is 102 out of which two OARs are registered twice- 1. RAIITH (Research Archive of Indian Institute of Technology Hyderabad) and 2. NIRTIR (National Institute for Research in Tuberculosis Institutional Repository). To avoid cross classification these were eliminated and thus the total count of OARs in India stands 100 i.e., our population, with confidence interval 90%, margin of error 5% and population proportion 5%, that have been calculated for sample size determination by using the following formula[10],

$$n' = \frac{n}{1 + \frac{z^2 \times \hat{p}(1-\hat{p})}{\varepsilon^2 N}}$$

Where, z is the z score
ε is the margin of error
N is the population size
p̂ is the population proportion

Thus, the sample size stands as 35. These samples of OARs were chosen by using Simple Random Sampling method from OpenDOAR. Among these 35 OARs chosen from OpenDOAR for this study, 24 are also registered in ROAR.

- Second part is to analyze the **repositories' performance** using a web analytics tool i.e., **NIBBLER**[9] **(https://nibbler.silktide.com/)**. All the tests were done in between February 7-11, 2022.
- And lastly an **evaluative analysis** of **RWWR browsing and retrieval services** and **Transparent Ranking**[5] provided by RWWR is also included in the study with specific emphasis to the **Indian repositories registered in OpenDOAR and ROAR.**

## Data collection and analysis:
## List of repositories

| Authoritative resource | Functional Repository | | | Non-Functional or Not Accessible Repositories | Total | Percentage (%) |
|---|---|---|---|---|---|---|
| | Total | Repository with wrong URL | Authorization Required | | | |
| **OpenDOAR** | 91 | 22 | | 9 | 100 | 91% |
| **ROAR** | 82 | 32 | 1 | 21 | 103 | 79.6% |

**TABLE 1: List of repositories**

Though the search executed in OpenDOAR and ROAR with the same parameter "Country- India" but the retrieval of OAR list is different from both the authoritative resources. After deduplication of repository list the total count of OARs in OpenDOAR is 100 and in ROAR the total number of OARs was 124 on 8/02/2022 which was exported as multiline CSV record and after deletion of duplicate record the number reduced to 103. One OAR from ROAR named "*Mahatma Gandhi University - Online THESIS Search*" requires authorization to navigate the website. It has been observed that in maximum cases the repositories overlap both in OpenDOAR and ROAR, but a countable few are there having exclusive inclusion in either OpenDOAR or ROAR.

## State-wise distribution of OpenDOAR Data:

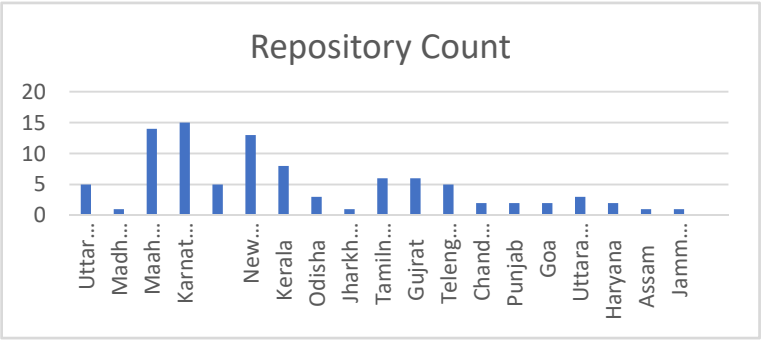



**Figure: Country-wise Repository Count**

As OpenDOAR does not provide the repository details with any geographical identifiers except country, so this study observed the state-wise distribution of OARs in India enlisted in the respective directory. The highest number of repositories are in Karnataka. Zone-wise the lowest performance is from the North-East region of India, there is only 1 repository from Assam enlisted in OpenDOAR.

**Comparative analysis of OpenDOAR and ROAR:**

| **Parameter** | **OpenDOAR** | **ROAR** |
|---|---|---|
| **URL** | Present | Present |
| **Export** | Absent | Present |
| **Interoperability** | Present | Present |
| **OAI-PMH** | Present | Present |
| **Record Count** | Absent | Present |
| **Geographical Identifiers** | Absent | Present |
| **Country** | Present | Present |
| **Subject Specific** | Present | Absent |
| **Record Creator** | Absent | Present |
| **Visualization** | Static | Dynamic |
| **Proliferation/User Engagement** | User initiated but moderated | Only User initiated |

**TABLE 2: Comparative analysis of OpenDOAR and ROAR**

The comparison between directory and registries invariably invites some bit of discrepancies while using predefined parameters. It digs out the pros and cons of the two authoritative resources on Open Access.

ROAR in comparison to OpenDOAR appears robust in data dissemination as it provides total record counts, geographical identifiers (latitude and longitude) as well as varied forms of data visualization.

On the other hand, OpenDOAR stands apart from ROAR in terms of subject representation, whereas the visualization of data is static in manifestation and export facility is absent which is considered as one of the prime features of any web directory for its evaluation.

## Repositories performance analyzed using Nibbler:

| Repository Name | Overall Score | Accessibility[1] | User Satisfaction[2] | Technology[3] |
|---|---|---|---|---|
| Knowledge Repository of Indian Institute of Horticultural Research (E-Repository@IIHR) | 9.4 | 10 | 9.3 | 9.1 |
| DSpace at Vidyanidhi | 9.3 | 10 | 8.5 | 9.3 |
| AIJR Preprints | 8.7 | 9.8 | 7.9 | 8.9 |
| CSIR-NCL Digital Repository | 8.4 | 9.7 | 7.3 | 9.2 |
| Institutional Repository - University of North Bengal (Institutional Repository NBU) | 8.4 | 9.5 | 7.6 | 9.1 |
| E Knowledge Center | 8.1 | 10 | 7.3 | 9 |
| Digital repository of West Bengal Public Library Network | 8 | 9.8 | 8 | 9.1 |
| DRS at National Institute Of Oceanography (DRS@nio) | 7.9 | 9.1 | 7.2 | 8.1 |
| Digital Knowledge Repository of Central Drug Research Institute (DKR@CDRI) | 7.9 | 8.7 | 7.6 | 8.6 |
| Electronic Theses and Dissertations at Indian Institute of Science (edt@IISc) | 7.8 | 9.1 | 7.1 | 8.2 |
| DSpace @ GGSIPU | 7.7 | 8.1 | 7.5 | 5.9 |
| DSpace@IMSC | 7.7 | 9.3 | 8.1 | 8.3 |
| DSpace at Indian Institute of Management Kozhikode (DSpace@IIMK) | 7.5 | 9.7 | 6.9 | 8.6 |
| DSpace@INFLIBNET | 7.5 | 9.5 | 7.2 | 8.4 |
| Dspace at IIT Bombay (DSpace@IITB) | 7.5 | 9.5 | 7.3 | 9.1 |
| DIR@IMTECH | 7.2 | 9.3 | 6 | 7.3 |
| Digital repository of Cochin University of Science & Technology (Dyuthi) | 7.2 | 8.2 | 4.8 | 7.8 |
| EPrints@IIT Delhi | 7.1 | 9.2 | 7 | 8.2 |
| National Aerospace Laboratories Institutional Repository (CSIR-NAL) | 6.9 | 8.1 | 5.8 | 8.4 |

| | | | | |
|---|---|---|---|---|
| Dspace@NITR | 6.9 | 8.9 | 6.5 | 8 |
| Indian Academy of Sciences: Publications of Fellows | 6.8 | 8.1 | 5.6 | 7.9 |
| Electronic Theses and Dissertations of The Tamil Nadu Dr. M.G.R. Medical University | 6.7 | 8.1 | 5.5 | 7.9 |
| AMU Repository (Knowledge Repository) | 6.6 | 8.3 | 5.5 | 8.2 |
| Bhogawati Mahavidyalaya Institutional Repository | 6.6 | 9.1 | 7.8 | 8.1 |
| ethesis@nitr | 6.5 | 8.2 | 5.2 | 7.5 |
| Eprint@NML | 6.4 | 7.9 | 4.8 | 7.2 |
| Eprints @MDRF | 6.4 | 8.2 | 4.8 | 7 |
| DigitalLibrary@CUSAT | 6.2 | 7 | 5 | 6.8 |
| ARIES, Digital Repository | 5.9 | 8 | 4.8 | 7.5 |
| IR@NPL | 5.8 | 6.4 | 5 | 6.6 |
| IR@CECRI | 5.7 | 6.4 | 4.9 | 6.6 |
| IR@CGCRI | 5.7 | 6.4 | 4.8 | 6.6 |
| NEERI Institutional Repository (IR@NEERI) | 5.7 | 6.4 | 4.9 | 6.6 |
| IR@NEIST CSIR North East Institute of Science and Technology Open Access Institutional Repository (IR@NEIST) | 5.6 | 6.4 | 4.8 | 6.6 |
| IR@Central Leather Research Institute (IR@CLRI) | 5.2 | 6.4 | 4.8 | 6.5 |

**TABLE 3: NIBBLER Results**

Nibbler Web Analytics tool measures performance of websites (non-IP address based) with four broad categories, namely, Accessibility, Experience, Technology and Marketing. Based on these four parameters Nibbler calculates overall scores out of 10. This study excluded Marketing Category as OARs are not directly associated with marketing. Hence the overall score derived by Nibbler might invite pitfalls in the score depicted. Most of the cases the marketing category provided marginal value in comparison to Open Access Repository sites corresponding to a business site.

The three parameters taken into consideration for the study comprise sub-parameters which were also been tested. Due to paucity of space and unnecessary cluttering of data those tests results are furnished as add-ons. The terminology used in this study as 'User Satisfaction' instead of 'Experience' (in NIBBLER) is rationalized because of the sub-parameters under experience mainly deals with user-interface and users' information behavior.
The superscript used in Table 4 under the categories represent the presence of sub-parameters under those categories.

| **Accessibility[1]** | **User Satisfaction[2]** | **Technology[3]** |
|---|---|---|
| URL Format | Twitter | Printability |
| Headings | Printability | Metatags |
| Internal Links | URL Format | URL Format |
| Mobile | Popularity | Headings |
| Page Title | Internal Links | Internal Links |
| | Server Behavior | Server Behavior |
| | Amount of Content | Images |
| | Images | Mobile |
| | Mobile | |
| | Freshness | |

**TABLE 4: Nibbler Evaluation Parameters**

Under Accessibility the five tests were done by Nibbler which corresponds to Information Access by the end user. Out of these five sub-parameters mobile accessibility, internal links and URL format are considered as the prime criteria for evaluation. The three prime criteria visible under accessibility are also manifested both in User Satisfaction and Technology. Up-to-date ness or freshness of the website comes under user satisfaction seems to be pivotal indicator for any website as it satisfies "Principle of Currency". The Technology category is divided into eight sub-parameters which manifest administrative metadata and the backend technology and algorithm used for development of the sites. Under this category the most important sub-parameters seem to be metatags and headings as they are intermingled with each other.

## Ranking of the repositories:

| Sl. No. | Repository Name | Popularity | RWWR RANK |
|---|---|---|---|
| 1 | DSpace@INFLIBNET | 24953 | Not available |
| 2 | Dspace at IIT Bombay (DSpace@IITB) | 26342 | 2429 |
| 3 | EPrints@IIT Delhi | 28127 | 923 |
| 4 | Electronic Theses and Dissertations at Indian Institute of Science (edt@IISc) | 44283 | 907 |
| 5 | DSpace @ GGSIPU | 45070 | Not available |
| 6 | Dspace@NITR | 51795 | 1660 |
| 7 | ethesis@nitr | 53030 | 699 |
| 8 | AMU Repository (Knowledge Repository) | 58544 | 3885 |
| 9 | DSpace at Indian Institute of Management Kozhikode (DSpace@IIMK) | 69386 | 3060 |
| 10 | Knowledge Repository of Indian Institute of Horticultural Research (E-Repository@IIHR) | 121845 | Not available |
| 11 | DigitalLibrary@CUSAT | 128467 | Not available |
| 12 | Digital repository of Cochin University of Science & Technology (Dyuthi) | 130659 | Not available |
| 13 | Indian Academy of Sciences: Publications of Fellows | 160787 | 1040 |
| 14 | CSIR-NCL Digital Repository | 204059 | 3688 |
| 15 | DSpace at Vidyanidhi | 234029 | Not available |
| 16 | DRS at National Institute Of Oceanography (DRS@nio) | 255396 | 1557 |
| 17 | National Aerospace Laboratories Institutional Repository (CSIR-NAL) | 387243 | 3885 |
| 18 | DSpace@IMSC | 409222 | Not available |
| 19 | Electronic Theses and Dissertations of The Tamil Nadu Dr. M.G.R. Medical University | 432662 | Not available |
| 20 | Digital Knowledge Repository of Central Drug Research Institute (DKR@CDRI) | 436420 | Not available |
| 21 | Institutional Repository - University of North Bengal (Institutional Repository NBU) | 512101 | 1286 |
| 22 | AIJR Preprints | 704805 | Not available |
| 23 | DIR@IMTECH | 734263 | Not available |

| | | | |
|---|---|---|---|
| 24 | Eprint@NML | 868426 | 1176 |
| 25 | ARIES, Digital Repository | 1025304 | Not available |
| 26 | IR@CECRI | 3401402 | 2306 |
| 27 | IR@CGCRI | 3401402 | 3196 |
| 28 | IR@Central Leather Research Institute (IR@CLRI) | 3401402 | 3829 |
| 29 | NEERI Institutional Repository (IR@NEERI) | 3401402 | 3524 |
| 30 | IR@NEIST CSIR North East Institute of Science and Technology Open Access Institutional Repository (IR@NEIST) | 3401402 | 3557 |
| 31 | IR@NPL | 3401402 | 3387 |
| 32 | Eprints @MDRF | 5738489 | 3361 |
| 33 | E Knowledge Center | 6012460 | Not available |
| 34 | Bhogawati Mahavidyalaya Institutional Repository | Not yet been ranked by Alexa | Not available |
| 35 | Digital repository of West Bengal Public Library Network | Not yet been ranked by Alexa | Not available |

**TABLE 5: Popularity Ranking (Nibbler) Vs. RWWR Transparent Ranking**

The above table shows comparison between the ranking provided by Nibbler and RWWR. In NIBBLER's terminology the ranking is 'Popularity' which is none but the Alexa Global Ranking. RWWR ranking is the transparent ranking of World repositories. From the total population of 100 repositories, this study sampled out 35 OARs of which only 20 are listed in RWWR transparent ranking list till February 2022. The institutional repository of National Institute of Technology Rourkela topped in RWWR (out of 20) with the world rank 699. Inflibnet stands as the mostly used OAR in India out of studied 35 repositories according to **Alexa Global Ranking** but is not ranked under RWWR. Among the population of a total 100 Open Access Repositories enlisted in OpenDOAR, this study found that "Krishikosh" is the top Indian OAR with a rank of 47 in the RWWR ranking.

**Results and discussion:**

- From this study it has been observed that the percentage of functional repository is much more in OpenDOAR than in ROAR.

- OpenDOAR provides data on four categories 1. Repository Information, 2. Organization, 3. Open Access Policies and 4. Record Details. No data under "Open Access Policies" category is found except AIJR Preprints.
- Although OpenDOAR claims that the OARs enlisted in OpenDOAR are "*carefully reviewed and processed by a member of our editorial teams*" many functional OARs are unreachable because of wrong URLs. So, URL validation or regular updating of the URLs are suggested.
- It is traced that all the OARs enlisted under OpenDOAR, the bulk 'last update' is 12th January, 2022 whereas Nibbler shows different updation dates. The study identified that many of the repositories were not updated even for last ten years.
- Due to the facility of direct user submission in ROAR registry, it is visible that many of the OARs are enlisted multiple times resulting a total list of 124 Open Access Repositories in India. By de duplication of the data, the number is reduced to 103. Many of the URLs provided in the record details of the OARs seemed to be inaccurate.
- ROAR (http://roar.eprints.org/cgi/roar_graphic?cache=4568690) website provides additional features such as graphical representation of the data, which could not be visualised.
- Apart from transparent ranking, the RWWR provides continents as well as country-wise searching facilities. While using those facilities by the authors, the retrieved result always showed "***There are no date formats found in the db***".
- The ranking by Nibbler (source Alexa Global Rank) and the RWWR transparent ranking are poles apart from each other. The methodology used in both the cases are different; RWWR uses Visibility, Transparency and Excellence of the repositories whereas NIBBLER(Alexa) compares the popularity of the websites in respect to other websites to provide the rank depending on the traffic of the websites.

## Conclusion:

This paper highlights the advantages and drawbacks of the Directory of Open Access Repositories (OpenDOAR) and the Registry of Open Access Repositories (ROAR) which may help the editorial teams and administrators of the respective directory services to evaluate and improve the deliverables and facilities provided by them. Implementation of web analytics tool for the study fosters to evaluate the performance of the websites of OARs and the results may guide the administrators to identify the weaknesses of the OARs in real time for ratifications of the pitfalls embedded therein. OARs are the contemporary knowledge carriers and thus

required to be in motion barring its stillness. This paper approaches the SWOT analysis of Open Access Repositories by redefining the 'Threat' as challenges that requires to be overcome for the generation of social goods.

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# Library is Growing Organism - Environmentally and User Friendly of digital Library in Digital World

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**Abstract**
*Digital libraries potential new societal paybacks, exclusively for e-learning in digital or mobile times, starting with the exclusion of the time and space limitations of old-style bricks-and-mortar libraries. The library and information professionals are required to gain such information and assistances as the library is one of the vastly IT subjective service profession. This paper gives an overview of how digital library is user friendly and environmentally friendly, this paper also highlights on the environmentally and user friendly of digital library in digital world.*

**Keywords :** *Digital Library, Environmental friendly, User friendly, Time management*

## Introduction:

Present era is called as a digital world, because everything we create, store, disseminate and communicate the information via digital form and also everyone get or access the information also digital form. Digital information includee-books, e-journal, e-zine, picture, 3D Graphics, audio, video, braily audio books, e-maps and e-documents. These things need less low space as compare too traditional method. The ultimate aim of the digital library is provide right information to right people to right time and save environment and nature.

## Definition of e-library

It's an electronic or online library where one can have access to books, journals, novels, articles, or any other information over net.

## Additional Information

Either general reader or a research scholar may have access to a number of e-libraries sitting at home itself.

**User friendly of the Digital Library**:

- Create, Store, disseminate the information of user.
- For space saving.
- To be support library activities such as technical section, circulation section, serial control section, stock verification, etc.,
- To digitize the important and rare traditional book or documents for future generation people.
- To make information in digital form and save nature.
- To provide information round clock wise and avoid four wall access system.
- To support distance of higher education, research for access information @ any time @ anywhere.
- To access the information in single location and simultaneously access more number of users at same time.
- To provide best service to users.

**Traditional library to environment friendly digital library:**

Now a days Digital library is very eye-catching, informative and user friendly to the benefactor than traditional library, because traditional library have a closed access of the information and also take more time to find out the particular information, traditional library is one of the highest reason for destroying the environment because it has a paper back of book, so they cut the trees and they were demolish the habitation. As compare to digital library is an open access without any boundaries and we can find out the information with few seconds through key word, author, and title.

**Environmental friendly of digital library**

Paper back of books made by tones of trees and emitting the tones of CO2. It is not good for environment and also human beings.

According to Saurabh Bangur, presidents Indian paper manufacturers association: 90% of wood used for paper industry for making paper in India. In last 10 years, the paper demand has around doubled 9 million tonnes in 2007 – 2008 to over 17 million tones in 2017 – 2018. 20 million tonnes in 2019 – 2020.

**Migrating digital library:**

Hard copy of the paper book production produced CO2, NO2, SO2 because of production of chemicals, packaging, fuels and energy .Migrating digital library

means hard copy to soft copy which is help to reduce green gas emission because and helps to sustainability goals.
According to 2014 life cycle analysis "printed books, an individual e-user is equivalent to 40 t0 50 paper books"

**Cloud computing:**
Now a days cloud computing is very vital role for digital library. Every document will be stored in cloud and we access it anywhere. Microsoft, Google, amazon have been providing cloud computing service .they were signed MOU to power sector which is power purchase from renewable energy. This technology save billions of money in carbon emission and electricity cost.

**Digital library during Covid:**
During Covid time schools and colleges are closed, here they need necessity of digital library so patrons access the information through digitally. It is very helpful to researcher, students, and teachers. Digital library make patrons to updated the information and enhancing the knowledge during Covid time. Libraries will same into the future but the only things to change is information access from physical building to virtual building with free of cost.

**Conclusion:**
According to S.R Ranganathan five laws of library science:
Fifth law – "The Library is a Growing Organism" he is predicted and which is relevant to present situation of library resources and services and Role of librarians. Which means that a library should be frequently growing institution like organism, never static in its stand point.

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# The Role of the Institutional Repository

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**Abstract**

*Institutional repository is the most powerful online archive tool to provide the efficient service among the community of institutions. Institutional Repositories are digital collection that captures, collect, manage disseminates and preserves the intellectual output of an institution. Institutional repository is a very powerful idea that can serve as an engine for institutions of higher education, and more broadly for the scholarly enterprises that supports academic and research activities. The repositories also serve as a comprehensive publications database of the parent organization, which in turn facilitate better management of research knowledge, better visibility and wider access, rapid communication of research, long-term preservation. Institutional repositories are a practical, cost effective & statistic means for academic institutions for built partnership with their faculty to advance scholarly communications. Institutional repository provides tools that help faculty, students and researchers disseminate their work to audience outside the institution. This paper discusses about the concepts of institutional repositories, their elements, advantages, open access softwares like Dspace, E-prints and implementation of IR in Indian institutes.*

***Keywords:*** *Institutional repositories, Open access software, IRs in India.*

## Introduction

Digital archives of intellectual products created by the faculty, staff and students of an institution or group of institutions accessible to end users both within and outside the institution. The IR is a digital archive, owned and maintained at either departmental or institutional level. Essentially, it is a tool for collecting, storing and disseminating information. Institutional Repositories are digital archives for collecting, storing, preserving and disseminating scholarly content of an institution. Universities and research organizations world over are building institutional repositories for communicating their research outputs to the community of users worldwide. Institutional Repository is also the permanent deposit of research and conference papers, e-theses, student projects and teaching and learning materials produced by community of staff and students. Repository content can be browsed or searched through the website, wherever possible repository content is freely available for download.

## Elements of Institutional Repository:

As the digital Institutional Repository can be any collection of digital material hosted,
owned or controlled and disseminate by any institution irrespective of purpose of origin. Institutional Repository can assume many forms and serve a variety of purposes as per the functions and objectives of parent institution. A digital archive of the intellectual product by the faculty, research staff and students/ research scholar of an institution and it should be accessible to end user without boundaries (with in and out of the institution).The content of an Institutional Repository could be:

- Pre-prints of articles or research reports submitted for publication
- The text of journal articles accepted for publication
- Revised texts of published work with comments from academic readers
- Conference papers
- Teaching materials
- Student projects
- Doctoral theses and dissertations
- Datasets resulting from research projects
- Committee papers
- Computer software
- Works of art
- Photographs and video recordings

## Institutional Repositories - Concept

Institutional Repositories as a means to manage and preserve effectively an institution's knowledge base and intellectual assets results in the content of institutional repositories expanding beyond e-prints to include research data, e-learning materials and other forms of institutional intellectual outputs, which are generally not published or preserved elsewhere. It needs to be ensured that content within the repositories remains accessible and retains its authenticity, reliability and integrity for as long as it is needed.

## Attributes of an Institutional Repository

An Institutional Repository is a digital archive of the intellectual product created by the faculty, research staff, and students of an institution and accessible to end users both within and outside of the institution. The contents of an institutional repository should be:

**1. Institutionally based**

The institutional repositories preserve the scholarly content and other intellectual property generated by an institution's community.

2. **Scholarly material in digital formats**

Institutional Repository contains work generated by students, researchers and faculty members of the institution. It may include e-version of conference proceedings, institution's annual reports, learning objects, patents etc.

3. **Cumulative and Perpetual**

Cumulative nature of institutional repository implies that it must be able to incorporate successive additions of submissions per year and must ensure preservation of millions of digital objects. By perpetuity, we mean to preserve and facilitate access to digital content for a long-term.

4. **Open and Interoperable**

An institutional repository system must support interoperability to facilitate access through multiple search engines. It must maintain and expose metadata, thereby allowing metadata harvesters to search an and collect the content.

**. Aims of Institutional Repository**

There are many reasons to implement an institutional repository.

1. To create global visibility for an institution's scholarly research;
2. To collect content in a single location;
3. To provide open access to institutional research output by self-archiving it;
4. To store and preserve other institutional digital assets, including unpublished or otherwise easily lost ("grey") literature (e.g., theses or technical reports).

**Need for Institutional Repositories**

At the most basic and fundamental level, an institutional repository is the means to prove that the product of the research activity of a university will be represented, documented and shared in a digital form. For universities, institutional repositories can be used as marketing tools used to demonstrate the faculty and student research.

The creation of an institutional repository has become very common in academic libraries, due to the availability of a number of open source software platforms that allow for simple implementations. Libraries decide to undertake such projects because they have realized that these can be used as a venue for the centralization, storage and long-term duration of all types of institutional output. It is also a way of maximizing availability, accessibility and functionality of the research product at no cost to the user.

## Advantages of Institutional Repositories

The repository makes the University's research and teaching and learning materials more visible, faster communication and widely available. Students, funding bodies and other researchers can see and have access to the doing work.

**Benefits to the Institution:**

- The most important advantage as opined by both IR system staff is that IRs provide wider access and visibility to the research output.
- The scholarly material produced by the university is available in one place, reflecting the intellectual achievements of the institution, and serving as a valuable marketing tool.
- Centralization and storage of all types of institutional output, including unpublished literature.
- Support for learning and teaching. Links may be made with the virtual teaching environment.
- The IRs play a vital role in the preservation of institution's heritage as the authorities/ faculty/ scientists would not permanently be in the institution but the IRs once built up, maintained and updated will continue to be the source for information on the research carried in the concerned institute irrespective of its age.

**Benefits to the Authors:**

- storage and access to a wide range of materials. Many authors lack time, resources, or expertise to ensure preservation of their scholarly work. Through an organizationally based IR strategy, long-term accessibility and greater security of work is assured. Research items get a permanent URL compared to a personal or departmental web site.
- feedback and commentary from users. Authors are able to receive and respond to commentary on 'pre-prints'.
- added value services; such as hit counts on papers, personalized publication lists and citation analyses.
- Instead of scattered in different databases, all the intellectual output of an individual are kept in a well organized way in a single place.
- IRs provides a new and innovative channel of scholarly communication both for already published documents and the documents falling under the grey literature category. The grey literature like Technical Reports, Theses, in house publications are not generally published for wider circulation. IRs fills up this gap.

**Benefits to society/community:**

As scholarship is shared, society at large benefits. Maximizing public access to research findings online, in turn maximizes its visibility, usage and impact. It

also maximizes its benefits to research itself in terms of research dissemination, application and growth, research productivity and progress. Also more sponsors of funded research now have mandates for authors to deposit their articles and other research outputs as a condition for funding.

## Challenges of an IR

Lynch, C. has cautioned that an IR should not become a tool for enforcing administrative control over academic work. Despite the numerous benefits of an IR, there are implications and potential barriers to its success as summarized below:

- The initial financial cost for open source software adopted by most institutions for creating IRs is not high but the recurrent costs; especially staff costs may be significant.
- A successful IR depends on the willingness of authors to deposit their work voluntarily and there may be local barriers and hindrances to be overcome.
- There are acknowledged difficulties in generating content, especially at the beginning.
- Difficult to sustain continuous support and commitment from the management and academic staff.

## .Open Access Source Software for Institutional Repositories

Open access is free to access, use, and store, with no purchase, fees, or registration required and unrestricted online access to digital scholarly material. Open access is the literature that should be freely accessible online is that which scholars give to the world without expectation of payment. Open access to scholarly materials means that its free availability on the Internet and any users can read, download, copy, distribute, print, open access documents under creative commons licenses or similar licenses. There are number of open access software available for creating/developing institutional repositories, the brief some of the important softwares are given below;

## DSpase

DSpace (http://www.dspace.org) was developed jointly by the MIT library and HP. It captures, stores, indexes, distributes & preserves an organization's research data. DSpace support institutional repositories and electronic records management. DSpace indexes digital content, so users can search and retrieve results quickly. DSpace distributes digital content over the World Wide Web and also searchable through search engines. Dspace preserves and enables open access to all sorts of digital content including text, videos, images, and audio files. DSpace is being used worldwide to meet many digital archiving needs.

**E-prints**

E-prints is a free open source software and developed at the University of Southampton E-prints is the most flexible platform for building high quality, high value repositories, recognized as the easiest & fastest ray to set up repositories of research literature, scientific data, students thesis, project reports multimedia artifacts, teaching materials, scholarly collections, digitized records exhibitions & performances. E-prints is the easiest and fastest way to set up repositories of open access research literature, scientific data, theses, reports and multimedia. E-prints were the Open Archives Initiative (OAI)- complaint repository software. It typically supports collections of pre-prints and technical reports often subject based in scope. Recently this software is being used / implemented to manage multidisciplinary institutional archives.

**Fedora**

Fedora (Flexible Extensible Digital object and Repository Architecture) is a digital repository system developed jointly by Cornell University Information Science and University of Virginia Library as project. The Fedora projects goal is to provide open-source repository software and related services to serve as the foundation for many different types of Information Management system. It also promotes the buildings of customs tools to expose the repository in creative ways.

**Greenstone**

Greenstone (http://www.greenstone.org) is software for building and distributing digital library collections. This software is produced by the New Zealand Digital Library Project at University of Waikato and developed and distributed in cooperation with UNESCO. It has been issued a Open-Source, multilingual software under the GNU General Public License.

**CDS Invenio**

CDS Invenio (formerly CDSware- CERN Document Server Software) is developed by and used at CERN and is available under the GNU General Public License. CDS Invenio manages over 5oo collections of data comprising of over 800,000 bibliographic records covering preprints, articles, books, journals, photographs and more.

**Archimede**

Developed by Laval University Library in Quebec City, Canada, the Archimede project was designed to accommodate electronic preprints and post prints from the institution's faculty and research staff. Archimede uses an indexing process, developed at Laval University that integrates in a single occurrence two types of documents: a) a Dublin Core metadata record in XML; and b) the full text of the document(s) described by the metadata. These documents can be of any type, including HTML, PDF, MS Word, MS Excel, TXT, RTF, and others

## Institutional Repositories in India

Many initiatives have been observed in India to digitize and preserve available knowledge. Various institutions have established their IRs to share resources and making their visibility worldwide. Academic institutions have also started preserving and sharing their resources with the help of IRs. The repository can be created and modified according to the needs and use of an institution. To create IR, many open sources software are available which are free and easily downloadable. Some of the institutional repositories are given below.

| S. No | Name of the Repository | Name of the Institution | URL |
|---|---|---|---|
| 1 | Eprints@CMFRI | Central Marine Fisheries Research Institute | http://eprints.cmfri.org.in/ |
| 2 | Dspace@GIPE | Gokhale Institute of Politics and Economics | http://dspace.gipe.ac.in |
| 3 | Eprints@IARI | Indian Agricultural Research Institute | http://eprints.iari.res.in |
| 4 | Dspace@iitb | IIT, Bombay | http://dspace.library.iitb.ac.in |
| 5 | Dspace@IIA | Indian Institute of Astrophysics | http://prints.iiap.res.in/ |
| 6 | Dspace@IIMK | Indian Institute of Management Kozhikode | http://dspace.iimk.ac.in/ |
| 7 | Eprints@IITD | IIT, Delhi | http://eprint.iitd.ac.in/dspace/ |
| 8 | Dspace@INFLIBNET | INFLIBNET | http://ir.infl ibnet.ac.in/ |
| 9 | Dspace@IMSC | Institute of Mathematical Sciences | http://www.imsc.res.in/xmlui |
| 10 | Eprints@MDRF | Madras Diabetes Research Foundation | http://mdrf-eprints.in/ |
| 11 | Eprints@SBT MKU | Madurai Kamaraj University | http://eprints.bicmku.in/ |
| 12 | Dspace@MDI | Management Development Institute | http:dspace.mdi.ac.in/dspace |
| 13 | Eprints@NIRT | National Institute for Tuberculosis Research | http://eprints.nirt.res.in |
| 14 | Eprints@NII | National Institute of Immunology | http://eprints.nii.res.in |
| 15 | Dspace@NITR | NIT, Rourkela | http://dspace.nitrkl.ac.in/ dspace |

| | | | |
|---|---|---|---|
| 16 | Eprints@NML | National Metallurgical Laboratory | http://eprints.nmlindia.org |
| 17 | Eprints@SVNIT | Sardar Vallabhai National Institute of Technology | http://eprints.svnit.ac.in/ |
| 18 | Dspace@TU | Thapar University | http://dspace.thapar.edu:8080/dspace/ |
| 19 | DU Eprint Archive | University of Delhi | http://erints.du.ac.in/ |
| 20 | Eprints@UOM | University of Mysore | http://eprints.uni-mysore.ac.in |

## Conclusion

Institutional Repositories are useful and popular among the academic and research community, the faculty should be made aware of the open access movement and existence of IRs; the benefits of archiving; value addition to individuals; and also self- archiving mandates. IR is most essentially an organizational commitment to the stewardship of the digital materials including long term preservation. The development of IRs is fast and many institutes are taking up initiatives to set up them. Libraries will server their users better, and help them preserve their treasure of knowledge for future. The repositories serve as a comprehensive publications database of the parent organization, which in turn facilitate better management of research knowledge, better visibility and wider access, rapid communication of research. Institutions need to set-up IR to make their knowledge output more visible to the outside world. The IR implementations have been on the increase in academic institutions and research organizations worldwide.

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# Health Information System: An Overview of Hellis Consortium and Indian Scenario

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**Abstract:**
*This paper discusses about WHO and its services for establishing and promoting International standards in the field of health. The objective of the health information system, its requirement, components uses and sources are highlighted. Function and methods in health communication which is the foundation of a preventive health care system is dealt with briefly. To enable timely appropriate updated dissemination of information. HELLIS which was initiated by WHO, SEARO, its origin its focal points activities and services are explained to attain the goal of health care for all.*

**Keywords:** *Health Information System, Who, Searo, Hellis, Health Communication*

## Introduction:

Health information is an integral par of the National Health System. It is a basic tool of management and a key input for the progress of any society. A Health Information system is defined as " a mechanism for the collection, processing, analysis and transmission of information required for organizing and operating health services, and also for research and training"[1] The primary objective of a health information is to provide reliable, relevant, up-to-date, adequate, timely and reasonably complete information for health managers at all levels.(i.e. central, intermediate and local) and at the sharing of technical and scientific including bibliographical information by all health personnel participating in the health service of a country, and also to provide at periodic intervals data that will show the general performance if health service and assist planners in studying their current functioning and trends in demand and work load.

## Requirements to be satisfied by health information systems

A WHO Expert committee[2] identified the following requirements to be satisfied by the health information systems

- The system should be population – based.
- The system should avoid the unnecessary agglomeration of data.
- The system should be problem oriented.
- The system should employ functional and operational terms( e.g. episodes of illness treatment regimens, laboratory test)
- The system should express information briefly and imaginatively(e.g. tables, charts, percentages)
- The system should make provision for the feedback of data.

## Components of a health information system:

The health information system is composed of several related subsystems. Comprehensive health information system requires information and Indicators on the following subjects3.

1. Demography and vital events
2. Environmental health statistic
3. Health status: mortality, morbidity, disabiligy and quality of life
4. Health resources: facilities, beds, manpower
5. Utilization and non-utilization of health services: attendance, admissions, waiting lists
6. Indices of outcome of medical care.
7. Financial statistics( cost, expenditure) related to the particular objective

## WHO – HEALTH Literature and information:

WHO acts as a clearing house for information on health problems? Its publication comprises hundreds of titles on a variety of health subjects. The WHO library is one of the satellite centers of the medical literature analysis and retrieval system (MEDLARS) of the U.S. National Library of Medicine. MEDLARS are the comprehensive computerized indexing system covering the whole of medicine on a field international basis. Pub Med is a service of the National Library of Medicine that includes over 15 million citations from MEDLINE and other life science journals for biomedical articles back to the 1950s. Pub Med includes links to full text articles and resources are available.

WHO Libraries common database (WHOLIS) is a bibliographic database of WHO publication from 1948 onwards. It is collective memory of WHO material from WHO offices and databases is maintained by the library of the WHO headquarters is Geneva. WHO SEARO Library collection (SEALIS) is a bibliographic database of completes holdings of SEARO library. It contains WHO Publications and documents, assignments and other information materials of WHO interest.

## Origin of HELLIS:

A survey of the libraries in the medical school was taken in 1969-1970 to find out how they were able to satisfy the health literature/ information needs if their clientele. It was found that these libraries were in poor condition and were deficient in the relevant literature required by their users. The paucity of funds was another factor which prohibited these libraries to grow and develop along proper lines. In fact the amount spent on acquisition of literature was hardly sufficient for the basic requirement of an average medical library. The problem was further compounded due to the continuous increase in the cost of the literature which was predominantly of western origin.

With the above prevailing situation in the region, the WHO South –East-Asia Regional Advisory Committee on Medical Research in its second meeting in 1976 recommended the development of a information network. Later in 1978, the WHO Regional Committee for South –East-Asia asked the Regional Director during its thirty first session held at Ulan Bator, Mongolia, to support libraries in member countries and develop a network of libraries and information centers for the South – East-Asia region.

Following upon the recommendations of the Regional Committee, a consultative meeting of senior librarians, administrators and users if the libraries form Bangladesh, Burma, Indonesia, India, Mongolia, Nepal, Srilanka and Thailand was held at the Regional Office New Delhi in August 1979 in which it was decided to establish a Regional New York of HELLIS to make better use of existing resources in the member countries of the region. The idea concretized itself in a proposal to have a flexible, open regional and national networks functioning on the principle of resource sharing, with the maximum possible country focal points.

## Networks of HELLIS –Services

Resource sharing and networking are inevitable for of available resources. It is essential to enable timely, appropriate update dissemination of information and to reduce the cost in the operation of individual units by developing formats for sharing all labor intensive output; it is where **HELLIS** initiated by **WHO –SEARO** plays a vital role. It was initiated in 1979 with an aim to meet the information

requirement of all kinds of medical organizations. It was started as a consortium of health science libraries in **WHO** South Asian member states. Its main mission is to provide information support tom policy makers, administrators and health care professionals by promoting identification, collection, processing, sharing and dissemination of National Knowledge assets by health science libraries.

**Health Library in Indian scenario**

**National telemedicine Portal**

The National Medical Library, a referral library in the field of Medical and Allied Health - functions under the administrative control of the Directorate General of Health Services, provides valuable library and information services to Medical and Allied Health Science professionals across the country. It is one of the heavily used Medical libraries in our country. About 100 users including PG Students, teachers, research scholars, practicing doctors / surgeons, health administrators, drug manufacturers, pharmacists visit the library every day. Library also receives a number of reference queries and provides quick reference service on telephone/e-mail.

NML- ERMED Consortium is an initiative taken by Directorate General of Health Services & Ministry of Health and Family Welfare to develop nationwide electronic information resources in the field of medicine for delivering effective health care. It was started in 2008. Presently, 87 state and centrally funded Government Institutions including all AIIMS is the member of consortium.

Government of India implementing a bright green field project on health including Telemedicine on National Medical College Network (NMCN) for interlinking the Medical College through the country with the reason of e-Education and National Rural Telemedicine Network for health care delivery, major quality of effort has been undertaken to give an outline to the project. The location for the National Resource centers and Regional Resource Centers for NMCN have been defined and the medical college to be connected to these five regional centers has also been worked out. The communication from MOHFW has been sent to all the states and UTs to provide the list of medical college to be networked and propose faculty members from each medical college as Nodal Officer for Telemedicine. High speed optic fiber based internet bandwidth been deployed under National Knowledge Network Project is as many as 150 Medical Colleges around the country. Many Medical Institutions have shifted to NKN backbone to improve their ability of telemedicine society using telemedicine platform deployed by central and state government agencies.

The Telemedicine infrastructure at JIPMER is up to date with most of the available Telemedicine instruments, high speed (1Gbps) internet connectivity, and satellite connectivity. Various telemedicine projects are currently running in JIPMER, which includes On conet Cancer project, National Knowledge Network (NKN), National Medical College Network (NMCN) and Medical Virtual Class Room project (MVCR). Multiple Telemedicine patient care services including Tele emergency, Tele-Out Patient Department, Tele-Intensive Care Unit, Tele-Follow up Clinic, Mobile Telemedicine Kiosk is successfully running in JIPMER. JIPMER has established international telemedicine collaborations with prestigious institutes in Japan, Korea, Malaysia, Indonesia, United Arab Emirates, Saudi Arabia, Germany, France and the United kingdom. JIPMER is an integral part of International networks like Asia Pacific Advanced Telemedicine network (APAN) Trans-Eurasia Internet network (TEIN) and GEANT (Pan European Telemedicine Network)[7]

Telemedicine Sessions, Live Streaming, Knowledge Repository, Centers Connected in First Phase of NMCN Project has given below.

**Content and Session Statistics**

| Sl. No. | Description | Statistics |
|---|---|---|
| 1 | Telemedicine session | 7159 |
| 2 | Live Streaming | 67 |
| 3 | Knowledge Repository | 2574 |
| 4 | Centers Connected | 50 |

**Content Management**

| Sl. No | Project | Tele service | More information (Regional Resource center) |
|---|---|---|---|
| 1 | Health and Wellness Centre, Virutual ICU, Collab DDS online radiology Sercice (CORS) | NMCN- Tele Education | National Resource center |
| 2 | ILBS-Echo project Extension of community Healthcare outcomes | NMCN – Tele consultation | Regional Resource center East |
| 3 | JIPMER-BIMSTEC- Bay of Bengal Initiative for | National medical Library | Regional Resource center |

| | | | |
|---|---|---|---|
| | Multisectoral Technical and Economical Co-operation | | West |
| 4 | BIST-ECBangladesh, India, Srilanka and Thailand Economic Co-operation | Digital Pathology` | Regional Resource center North |
| 5 | Tele Space | NMCN Video Channel | Regional Resource center Northeast |
| 6 | Tele Evidence | Request for Web Steaming. Ongoing web casting | Regional Resource center South-I. Regional Resource center South-II |

**The following seven NEPs were designated under HELLIS:**

1. National Medical Library and Documentation Centre, Institute of Public Health Nhakhali.
2. Department of Medical Research Library, Ministry of Health, 5. Zafar Shah Road, Rangoon, Burma.
3. National Medical Library Ansari Nagar New Delhi – 110029 India.
4. National Institute of Health Research and Development Ministry of Health, Jakarta, Indonesia.
5. Data Bank Library Health Planning Division Ministry if Health Kathmandu, Nepal.
6. Medical Library Faculty of Medicine University of Coloumbo P.O. Box.No. 271, Kynesy Road, Colombo, Sri Lanka.
7. Central Library Mahidol Univeristy,
8. Siriraj Medical Library) Bangkoknoi, Bangkok – 10700, Thailand.

**HELLIS Activities:**

With a view to improving to the health literature/ information and enhancing the skills of the librarians and increasing the capabilities of the health science libraries in the countries of **WHO** South- East –Asia Region, Several steps were undertaken, such as preparation of relevant, effective and detailed curriculum of regional training programme, conduct of training courses, holding of meetings, seminars and workshops at regional levels. Apart from this a member of such programmes were conducted at national level also. To strengthen the HELLIS National Focal Points,

the development of cooperative tools, development of minimum capabilities of libraries surveys of user needs and existing resources were undertaken.

HELLIS network was initiated prior to information technology (IT) application and Internet era, when libraries were predominantly traditional, handling printed media and manual information processing. The structure of the HELLIS network is a like 'network of networks', where each country has developed their network within the country to participate with the HELLIS. Each participating countries recognises a well developed library or a designated National Medical Library as the National Focal Point (NFP), which is networked horizontally and vertically through referral centres and resource centres within the country. Large libraries, having good information resources and qualified staff, are recognised as the resources centres. Of course to cover the service to all the health care team and public, irrespective of the users/public attached to institutions or not, it requires to extend the service through recognised "service extension centers" as a part of the network, as near as possible to grass root level. In some of the regions, coordination of the network was rotated among the libraries/information centers, considering national contact/focal point as the channel of communication for regional network. There are national network committee comprises NFP as fixed and the secretary is rotated among the participating libraries/information centers. The network has over 350 member libraries in 11 member countries namely Bangladesh, Bhutan, DPR Korea, India, Indonesia, Maldives, Myanmar, Nepal, Sri Lanka, Thailand, and Timor-Leste [1-3]. In HELLIS network, each nation is expected to develop their framework and functional approach for participation. The common goals of all regional and national networks are to identify, collect, organise, process, share, and disseminate national/international knowledge assets. The network aimed to ensure the easy access to maximum information at different level of network of libraries—libraries within the country, with other countries of the region and with other region. All participating members of the networks are treated as equal partners and all countries in the e regional network are also treated as equal partners. The HELLIS started as traditional model (network of libraries) for resources sharing and cooperative acquisitions, developed progressively in consonance with technological development and conformity with international standards. The network is supported by its well-developed and periodically reviewed guiding principles. The participation of the member libraries is not just to utilise the resources and services; they have to contribute in consolidating the national assets of the member countries. National level network are to take responsibility in promoting cooperation among libraries and/or various specialty subject areas by involving national institutes as referral libraries in extending optimal use of existing resource and services. The national level coordination has to

be developed by working suitable framework through their respective national authorities depending on political, economic, cultural and other local consideration with consensus of all the participant libraries. The information service from the network is not just confined to academicians; researchers and practitioners affiliated to institutions but also to health planners, administrators, and private practitioner and general public. All participating libraries are to be assisted by WHO in developing minimum capability for effective participation.

**HELLIS Services:**

As a part of the HELLIS activities, the WHO South East Asia Regional Office (SEARO) provides free of charge MEDLARS/ MEDLINE searchers and photocopies of references which are not available in the countries from where the request originates. For better channalisation of the services, only those request are processed which are forwarded through the HELLIS NFPs. For provision of photocopies, the requestors have at their disposal the sources of their own libraries, The HELLIS- NFPs, Regional resource libraries at Bangkok and New Delhi, WHO/SEARO Library, New Delhi, WHO Headquarters Library, Geneva and National Library of Medicine, Bethesda Maryland, U.S.A

Besides this, assistance/subsidy is provided by SEARO to member – countries for:

1. Organization of training course for health sciences librarians and providing fellowships to study library/ information science in other countries
2. Preparation of bibliographies /indexes of material published in the countries.
3. Publication of newsletters/bulletins;
4. Compilation of directories of health science libraries in countries.
5. Workshop/ National meetings of health science libraries to plan and implement HELLIS activities.
6. Preparation of union list of serial holdings of health biomedical periodicals in the countries.

**Networking of health science libraries in India**

Resource sharing and networking are inevitable for optimum utilization of available resources: to enable timely, appropriate, updated dissemination of information, to reduce the cost in the operation of individuals units by developing formats for the management of library programmers. Several models of outstanding networks for resource sharing have been developed in the discipline of medicine, starting with MEDLINE (1971). In India, efforts have been made from time to time in promoting the concept of resource sharing, but an organized approach has not evolved. The WHO-SEARO has initiated health literature, library and information

services (**HELLIS)** network in 1979 organizations. **NML** (Delhi) was made a focal point for **HELLIS** network in India, but is not operational and not delivering the goods for reasons unknowns. Another notable attempt is by the bibliographical Informatics Divisions of National Informatics Centre **(NIC)** which offers global access to medical scientist, practitioners, students and other dedicated health information centers in the country. In order to translate its aim into reality **ICMR-NIC** Centre for Biomedical Information was set up in 1986, which provides access to **MEDLINE** and other databases through **NICNET** to all health science professionals in the country. However, the studies indicate that these services are not utilized properly because (i) the network provides only bibliographical references, (ii) the health science libraries do not function in a network environment, and (iii) some of the users are not aware of this service. An attempt to create awareness regarding the network services and to develop a regional network of medical libraries was made by organizing a workshop on "User awareness on present infrastructure in Biomedical Information and Network" by University of Health Sciences.A.P.in 1991 5 .Though the workshop suggested the modalities to network the health science libraries functioning under the administrative control of University of Health Science. A.P. as on today no development took place.

Further, **NIC**, in 1993 has made preparation to set up a technologically advanced national information handling for offering full text, bibliographic retrieval, full access to internet, e-mail and access to over 200 networks in 160 countries to health science professionals. In addition, now Internet is accessible in major cities of the country with the provision of net server by DOT, which the medical professionals can make use of The developments indicate that the resource sharing and networking activity among health science libraries of India is in its infancy, except for the contribution of **ICMR-NIC**. Hence it is high time for the management, health science professionals and information professionals to make constructive and coordinated efforts for exchange of health science information at global level. Certainly it is heartening to note that India, having a National Medical Library; a well organized national level research council, ICMR, with a multilevel research laboratories; and medical and dental colleges that run in to a couple of hundreds and a high magnitude of health care centers under government and corporate sector, is deprived of a network at national level for exchange of health information.

## Conclusion

To conclude with the statement of our honorable prime minister Dr. Manmohan Singh(6)While delivering 4th annual convocation address at the All India Institute of Medical science said that "Investment in health while essential for economic progress is not motivated purely by economic considerations. We

recognize health as an inalienable human right that every individual can justly claim. So long as wide health care is not universally assured, we would fall in both economic planning and in our moral obligations to all citizens.

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# Aware and Use of Digital Library Information Resource and Services by The Students of Thiyagarajar School of Management in Madurai, Tamilnadu: An Analytical Study

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(Deemed to be University)

Accredited by National Assesment Accerediation Council with A++ Grade
Listed u/s 12 B of the UGC Act, 1956
Pondicherry – 607402.

**Abstract:**

*The present study is descriptive in nature using normative survey of Digital Library Information resource and service used by the student respondents in Thiagarajar School of Management, Madurai. This is an assessment study that describes the extent of status of the parameters prevailing in the study environment. The data collection method of this study was through structured questionnaire survey and observation. A pilot study was made and the findings were used to modify and refine the data collection tool.*

**Keywords:** *Digital Library, Library Information, Resource and Services, Aware and use of Library*

## INTRODUCTION

In this study an attempt is being made to highlight the use of Digital Library Information resources and Services in Thiagarajar School of Management, Madurai City. Academic Libraries, particularly in recent past are providing some of notable electronic information services that can be accessed via the College Library websites such as Web OPAC, latest addition display, data search, and federated

search, access to full text and bibliographic databases, online document delivery, and remote access and so on. The present study aimed at identifying the methods, approaches and practice among the students to potentials use these resources and access the preventable information.

Thiagarajar School of Management established in the year 1962 by the great philanthropist and industrialist, Shri. Karumuttu Thiagarajan Chettiar, Thiagarajar School of Management (TSM) began with the aim to impart professional education to managers who had a burning desire to scale up their career potential with better managerial skills. "TSM", as it is popularly called, ignited its institution building with an Executive Development Programme (EDP) to enhance the skills of the practicing managers and entrepreneurs in the vicinity of Madurai. The success of EDP and the accolades received from the industry provided the impetus to kick start the Master of Business Administration as a part-time programme in 1972. A full time MBA course started later in 1986 became a quick success drawing the attention of people from various paths of life.

## AIMS AND OBJECTIVES

- ✓ Distribution of Questionnaire for Thiyagarajar School of Management
- ✓ Distribution of Gender wise Information of Student Respondents on Thiyagarajar School of Management
- ✓ Awareness and Use of Management Science Electronic Databases
- ✓ Frequency of Time on use of E-Resources in a day
- ✓ Place of Access Using Internet
- ✓ Purposes of using e-resources

## DATA COLLECTION AND ANALYSIS

The study is confined to the Thiagarajar School of Management, Madurai. The result arrived at from the study may or may not be applicable to other management Colleges library environment. There may be response bias. The survey method which adopted for collecting the data in this study has its own limitations. Hence, the generalization of the findings of the study is subject to the above condition. The study is confined between the data collection period before COVID19 of January 2020 to March 2020.

## RESULTS

There are 150 structured questionnaires have been distributed among 150 questionnaires have been randomly distributed to the student respondents. Of which, 126 filled questionnaires received from the student respondents. The response rate is 84.00 percent. It is found from the table - 2 that the distribution of gender wise information of the student respondents in the Thiyagarajar School of

Management, Male are dominated with 67 (53.17 percent) respondents, while the rest is of Female 126 (46.83 percent) respondents. A huge majority of the surveyed students much aware the business and the management data bases namely, Indian Statistics.com (98.41 percent), AIMA (96.03 percent), Capital Line (80.16 percent), Emerald (77.78 percent) and MIMI (MICA Indian Marketing Intelligence) (75.40 percent). It is followed by the respondents stated that they aware the data bases SAGE Videos-Business and Management Collection (61.90 percent), Market line Advantage (60.32 percent), India state (53.97 percent) and LexisNexis Academic (26.98 percent). Among the usage the databases such as Indian Statistics.com (80.95 percent), AIMA (69.05 percent), Capital Line (66.67), Emerald (46.83 percent) and MIMI (MICA Indian Marketing Intelligence (44.44 percent), access and used by respondents. It is evident from the analysis (Table - 4) that the respondents to time spend on accessing e-resources in the library. It is found that 56 (44.44 percent) respondents spend time less than one hour at that time of accessing e-resources, which is followed by 39 (30.95 percent) respondents spend time One to Two Hours at that time of accessing e-resources and 31 (24.61 percent) respondents spend time More than Two Hours at that time of accessing e-resources. Preference on the place where the information resources get accessed among the academic users is one of the parameters of information seeking behavior on the perception among the surveyed management college student members accessed internet e-resources at their college libraries and residential places. It is quite interesting to note that the college library preferred by 59 respondents (46.83 percent) to access internet e-resources. Followed 23.02 percent of the respondents are preferred using internet of their home. It is evident from the above table – 6 the students are using internet for different purposes. Among them, there are 118 (93.65 percent) respondents using internet 'Academic Related Study' purposes, which is followed 106 (84.13 percent) respondents using internet 'Social Media' purposes, 101 (80.16 percent) respondents using internet for 'Access E–Resources' purposes and 92 (73.02 percent) respondents using internet for 'Download Games/Music/Movies' purposes.

## DATA ANALYSIS

**Table - 1: Distribution of Questionnaire for Thiyagarajar School of Management**

| Name of the College | Distribution of Questionnaire | Questionnaire Received | Percentage |
|---|---|---|---|
| Thiyagaraja School of Management | 150 | 126 | 84.00 |

**Table – 2: Distribution of Gender wise Information of Student Respondents on Thiyagarajar School of Management**

| Male | Percentage | Female | Percentage | Total | Percentage |
|---|---|---|---|---|---|
| 67 | 53.17 | 59 | 46.83 | 126 | 100.00 |

**Table - 3: Awareness and Use of Management Science Electronic Databases**

| S. No | Name of e-Databases | Aware | Percentage | Use | Percentage |
|---|---|---|---|---|---|
| 1. | Indian Statistics.com | 124 | 98.41 | 102 | 80.95 |
| 2. | AIMA | 121 | 96.03 | 87 | 69.05 |
| 3. | Capital Line | 101 | 80.16 | 84 | 66.67 |
| 4. | Emerald | 98 | 77.78 | 59 | 46.83 |
| 5. | MIMI (MICA Indian Marketing Intelligence) | 95 | 75.40 | 56 | 44.44 |
| 6. | ABI In forum | 94 | 74.60 | 43 | 34.13 |
| 7. | EBSCO | 89 | 70.63 | 39 | 30.95 |
| 8. | e-Marketer | 80 | 63.49 | 37 | 29.37 |
| 9. | SAGE Videos-Business and Management Collection | 78 | 61.90 | 35 | 27.78 |
| 10. | Market line Advantage | 76 | 60.32 | 34 | 26.98 |
| 11. | India stat | 68 | 53.97 | 33 | 26.19 |
| 12. | World Bank- e-Library | 65 | 51.59 | 33 | 26.19 |
| 13. | Harward Management Resource | 55 | 43.65 | 29 | 23.02 |
| 14. | Management Extreme | 49 | 38.89 | 26 | 20.63 |
| 15. | LexisNexis Academic | 34 | 26.98 | 21 | 16.67 |

**Table – 4: Frequency of Time on use of E-Resources in a day**

| S. No | Time spending | Respondents | Total |
|---|---|---|---|
| 1. | Less than One Hour | 56 | 44.44 |
| 2. | One to Two Hours | 39 | 30.95 |
| 3. | More than Two Hours | 31 | 24.61 |
| | **Total** | **126** | **100.00** |

**Table – 5: Place of Access Using Internet**

| S. No | Place of Access | Respondents | Percent |
|---|---|---|---|
| 1. | Library | 59 | 46.83 |
| 2. | Home | 29 | 23.02 |
| 3. | Internet center | 25 | 19.83 |
| 4. | Public Provisions | 13 | 10.32 |
| | **Total** | **126** | **100.00** |

**Table – 6: Purposes of using Digital Library E-resources**

| S. No | Purpose of Using Internet | Respondents | Percent |
|---|---|---|---|
| 1. | Academic Related Study | 118 | 93.65 |
| 2. | Social Media | 106 | 84.13 |
| 3. | Access E–Resources | 101 | 80.16 |
| 4. | Download Games/Music/Movies | 92 | 73.02 |
| 5. | Communicating with other people | 76 | 60.32 |
| 6. | Reading Online Newspapers | 67 | 53.17 |

| | | | |
|---|---|---|---|
| 7. | Consultancy/Business | 55 | 43.65 |
| 8. | Getting the Latest News | 53 | 42.06 |
| 9. | Shopping | 52 | 41.27 |

## TESTING OF HYPOTHESIS

**Hypothesis – Table - 3:** There is a significant difference in the Awareness and Use of Management Science Electronic Databases in the surveyed institution.

Awareness and Use of Management Science Electronic Databases n the surveyed institution - Chi-Square Test.

| | |
|---|---|
| Calculated value | 15.431 |
| Table value at 5 percent | 23.685 |
| Degrees of freedom | 14 |
| Inference | Significant |

*The Chi Square Result:* The calculated value is lower than tabulated value. Therefore, the hypothesis is accepted.

**Hypothesis – Table - 4:** There is a significant difference in the Frequency of Time on use of E-Resources in a day among students of surveyed Institution.

Frequency of Time on use of E-Resources in a day among students of surveyed Institution– Anova Test

Conclusion: cal $F_C$< tab $F_C$
$F_C = 9.65 < F_C(1,3) = 10.13$
We are accept at 5% level

cal $F_R$< tab $F_R$
$F_R = 3.24 < F_R(3,3) = 9.28$
We are accept at 5% level

*The Chi Square Result:* The anova result is in both cases the calculated value is lower than tabulated value. Therefore, hypothesis is accepted.

**Hypothesis – Table - 5:** There is a significant difference in the Place of Access Using Internet in the surveyed institution.

Place of Access Using Internet in the surveyed institution - Chi-Square Test.

| | |
|---|---|
| Calculated value | 9.611 |
| Table value at 5 percent | 7.815 |
| Degrees of freedom | 3 |
| Inference | Not Significant |

*The Chi Square Result:* The calculated value is higher than tabulated value. Therefore, the hypothesis is not accepted.

**Hypothesis – Table - 6:** There is a significant difference in the Purposes of using Digital Library E-resources in the surveyed institution.

Purposes of using Digital Library E-resources in the surveyed institution - Chi-Square Test.

| | |
|---|---|
| Calculated value | 9.760 |
| Table value at 5 percent | 15.507 |
| Degrees of freedom | 8 |
| Inference | Significant |

*The Chi Square Result:* The calculated value is lower than tabulated value. Therefore, the hypothesis is accepted.

## CONCLUSION

E-Resources are gaining momentum due to the advancement of internet and mobile technologies among the academics and researchers in all disciplines, particularly management subjects like professional programmes give much emphasize on use of the information technology as e-business and e-governance

become quite popular across the globe. Access to internet used behavior among the respondents is based towards assessing Digital Library e-resources behavior of the academic user community. Accordingly this part of solicited Digital Library information from the surveyed students in Thiagarajar School of Management on the aware, use and time spent on e-resources use and place of access and important place of internet on their study and teaching.

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# Challenges of Implementing KOHA Software in The Public Libraries in Kerala: *A Case Study of Thiruvananthapuram District*

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## Abstract

*The study investigated the challenges and difficulties faced by librarians of public libraries in Kerala while adopting and using Koha software. The study was used the descriptive survey method. The population of the study was selected in public libraries in the Thiruvananthapuram district of Kerala state. The data were collected through the structured questionnaire from librarians of the A+ Thaluk public libraries. The findings revealed that a major difficulty was librarians' inability to successfully use all of Koha's modules due to a lack of skills. They had difficulties in obtaining technical assistance from the Koha community. The majority of the librarians are qualified other than the library science field. The study suggests that Kerala State Library Council should conduct conferences, workshops and training programmes for librarians on how to use Koha software effectively and efficiently in public libraries in the state.*

**Keywords:** *Public Libraries, Koha, Open Source Software, ILMS, Challenges, Librarians, Thiruvananthapuram.*

## Introduction

The most popular free and open-source library management system is Koha (Bwalya & Akakandelwa, 2021). It is used all across the globe, and its growth is guided by a growing community of users who work together to achieve their technological goals. To fulfill the demands of its user population, Koha's feature set continues to improve and expand. Koha is a free and open-source integrated library system (ILS) that is utilized by the public, school, and special libraries all around the world. The Horowhenua Library Trust in New Zealand commissioned Katipo Communications to construct Koha in 1999,the first installation went live in January 2000 and the Trust distributed it under the most popular and flexible GNU General Public License to gain global support and ensure future development of the

system (Eyler, 2003). Koha is a full enterprise-class ILS with complete functionality, including basic and sophisticated choices, that is used in libraries of all sizes across the world. Acquisitions, circulation, cataloging, serials control, authority, flexible reporting, label printing, multi-format notifications, offline circulation for when Internet connectivity is not available, and much more are all included in Kaoha's modules. Koha is compatible with consortia of any size, as well as multi-branch and single-branch libraries

Koha presents several positive impacts such as an efficient cataloging system, remote management of library consumer records such as books or room reservations and a customizable searching interface for efficient usage (Ali, 2021).The Koha software is suitable for completely automating the library (Niranjana et al., 2020).Community support, commercial supporting, learning tools, library standards, and active development have all helped Koha Open Source ILS establish a foothold in the Indian library automation industry(Kumar & Jasimudeen, 2012).The availability of a Web OPAC, Koha's free availability, Koha's multilingual support, and Koha's compatibility for both the MARC 21 and Z39.50 standards were among the key reasons for Koha's growth (Asim&Mairaj, 2019).

## Objectives

The major objectives are;

1. To find out the level of awareness of Koha among librarians.
2. To identify sources of the library fund
3. To explore the difficulties faced by librarians while implementing and using Koha.
4. To study challenges faced by librarians while using Koha.

## Methodology

The methodology adopted for the study was the descriptive survey method and structured questionnaire used for the data collection. The random sampling method was used for this study, and the data were collected from the librarians of Kerala State Library Council (KSLC) registered A+ public libraries in Thiruvananthapuram district. The district has 6 taluks, and they are Thiruvananthapuram, Nedumangadu, Chirayinkeezhu, Kattakada, Neyyattinkara and Varkala. Presently the district has 15 A+ public libraries and the study covered 6 libraries from each of the taluks.

**Demographic Details**

| Variables | Value | Frequency | Percentage |
|---|---|---|---|
| Gender | Male | 1 | 16.7 |
| | Female | 5 | 83.3 |
| Qualifications | BLISc | 1 | 16.7 |
| | MLISc | 0 | 0 |
| | M.Phil. | 0 | 0 |
| | Ph.D. | 0 | 0 |
| | Certificate Course | 0 | 0 |
| | Others | 5 | 83.3 |
| Experience | 0-5years | 1 | 16.7 |
| | 6-10years | 3 | 50.0 |
| | 10-15years | 1 | 16.7 |
| | 16years and Above | 1 | 16.7 |

Table 1. Demographic Details

Table 1, represents the demographic details of respondents, in the gender-wise distribution out of 6 respondents, the majority of the 5 (83.3%) respondents are female and 1 (16.7%) respondent is male. The majority of the 5 (83.3%) respondents are qualified other than library science subjects and only 1 (16.7%) respondent qualified BLISc. Based on experience level half of the 3 (50%) respondents have 6 to 10 years of experience. The library prefers to choose librarians based on their nearest location to the library.

**Means of Awareness of Koha software**

| Sources | Frequency | Percentage |
|---|---|---|
| Conference | 3 | 50.0 |
| Training | 1 | 16.7 |
| Colleague | 2 | 33.3 |

Table 2. Awareness of Koha

Table 2, indicates the awareness level of Koha software among the librarians. Out of 6 respondents, the majority of the 3 (50%) respondents were aware of Koha through conferences, 2 (33.3%) colleagues and 1(16.7%) training. Koha library management software is well-known among librarians. The Kerala State Library Council offers training and conferences for librarians, which is a wonderful opportunity to learn about Koha software.

**Participation of Koha Training Courses**

| Values | Frequency | Percentage |
|---|---|---|
| Attended | 3 | 50.0 |
| Not attended | 3 | 50.0 |

Table 3.Participation in Koha Training Course

Table 3, shows the participation of the Koha-related certificate/training courses conducted by the Kerala State Library Council. Out of 6 respondents, half of the 3 (50%) respondents have attended the Koha certificate/training courses. Another half of the 3 (50%) respondents said they had not attended any of the training or certificate courses.

**Sources of Library FundReceived**

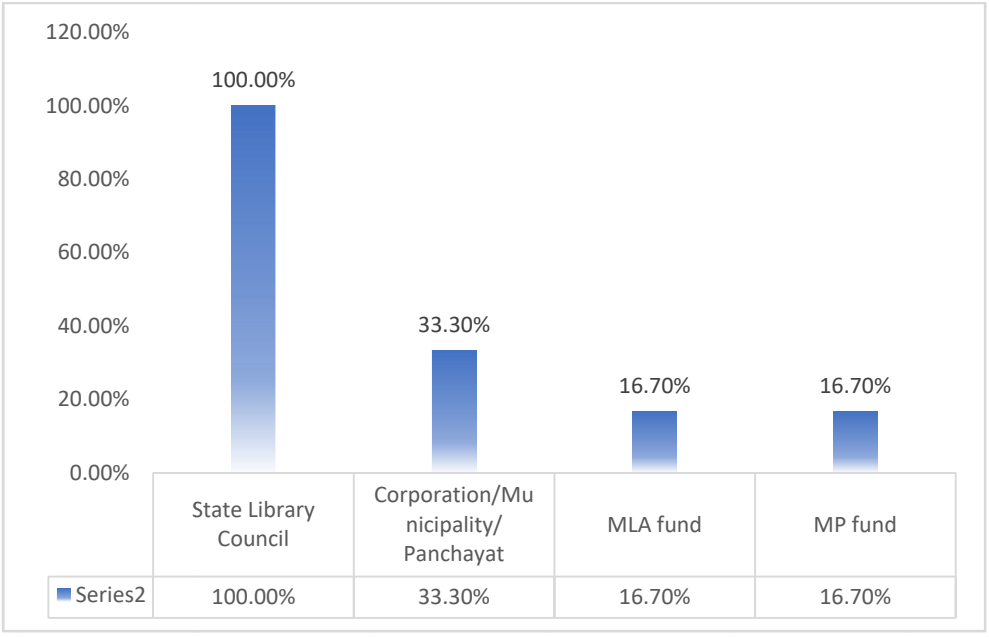



Figure 1. Sources of Library Fund

Figure 1 represents the sources of the fund received by the libraries. Almost all of the 6 (100%) respondents states libraries are receiving funds from KSLC, 2 (33.3%) Corporation/Municipality/ Panchayat, 1 (16.7%) MLA fund and MP fund. The library regularly receives funds from the Kerala State Library Council. Very rarely receiving the fund from Corporation/Municipality/ Panchayat, MLA and MP funds.

**Koha Installation and Technical Assistance**

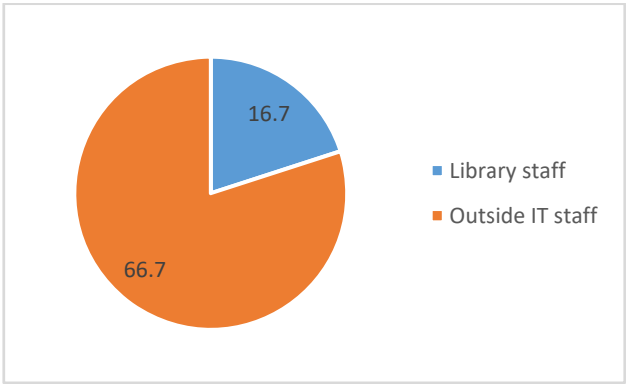



Figure 2. Installation and Technical Assistance of Koha in libraries

Figure 2 shows how the libraries handle Koha software installation and technical assistance. Out of 6 respondents, the majority of the 4 (66.7 %) respondents stated that if there is a difficulty with installation or technical issues, they prefer to use outside IT professionals and 1 (16.7%) handle library staff. The majority of library employees are unfamiliar with software development and coding. Technical difficulties with library management software are tough for librarians to handle.

**Difficulties Faced by Librarians while Implementing Koha**

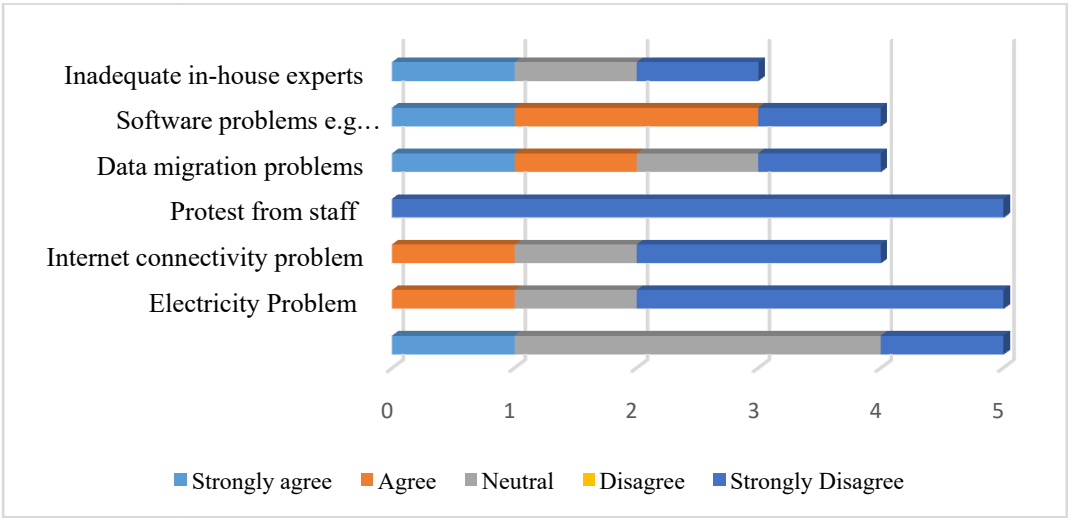



Figure 3. Difficulties faced by Librarians while using Koha

Figure 3 represents the difficulties faced by a librarian while using the Koha software. Out of 6 respondents, few of the 1 (16.7 %) respondents strongly agree that lack of in-house experts, software problem, data migration problem and lack of ICT skills. And 2 (33.3%) respondents agree that facing software problems like hanging and malfunctioning the software, following 1 (16.7%) respondents facing data migration problem, internet and electricity problem. Half of the 3 (50%) respondents are neutral that the lack of ICT skills, 1 (16.7%) respondents said data migration, lack of in-house expert, internet and electricity problems. The majority of the 5 (83.33%) respondents are strongly disagreeing with that protest from the library staff, 1 (16.7%) data migration, lack of in-house experts, internet and electricity problems.

## Challenges Faced by Librarians

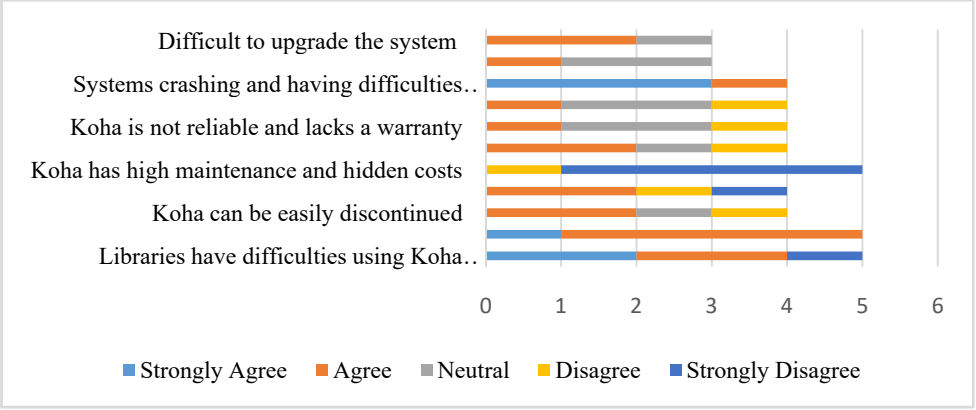



Figure 4. Challenges faced by librarian

Figure 4 indicates the challenges faced by a librarian while using Koha. Out of 6 respondents, half of the 3 (50%) respondents strongly agree that while using Koha the system crash and it's difficult to recover the data. following 2 (33.3%) respondents said that libraries have difficulties using Koha because of lack of trained personnel and 1 (16.7%) it's difficult to get technical support from the Koha community. The majority of the 4 (66.7%) respondents agree that facing challenges in difficulty to get technical support, 2 (33.3%) difficult to upgrade the system, Koha is complex and user-unfriendly, koha does not have adequate documentation, koha can be easily discontinued and libraries have difficulties using Koha because of lack of trained personals. Less than half of the 2 (33.3%) respondents are neutral that difficult to back up the database, difficulties using modules found in Koha and koha is not reliable and lack of warranty. Few of the 1 (16.7%) respondents facing

the challenges of difficulty to upgrading the system, Koha is complex and user-unfriendly, and koha can be easily discontinued. Fewer of the 1 (16.7%) respondents disagree that difficulties using modules found in Koha, Koha is not reliable and lack of warranty, Koha is complex and user-unfriendly, Koha has high maintenance and hidden costs, koha does not have adequate documentation and koha can be easily discontinued. the majority of the 4 (66.7%)respondents strongly disagree that Koha has high maintenance and hidden costs, following 1 (16.7%) koha does not have adequate documentation and libraries have difficulties using Koha because of lack of trained personnel.

## Findings

The major findings are;

- The libraries are getting funds from Kerala State Library Council.
- The study found that the majority of librarians are female, and their homes are within walking distance of the library.
- Most of the librarians have degrees in fields other than library science.
- The majority of the librarians are well aware of Koha software.
- Koha installation and technical issues are handled by the outside IT staff.
- The majority of libraries are experiencing issues with the software, such as hanging and malfunctioning.
- The difficulties in getting technical support from the Koha community is one of the major challenges for librarians.

## Conclusion

Koha is a well-known open-source library management software whose unique feature is that it can be customized to meet the needs of librarians. Koha relieves the librarian's workload by allowing them to finish tasks in time. The public libraries are not utilizing the koha software efficiently because of a lack of knowledge in the open-source software. The librarians must gain knowledge to use library management software. Librarians should attend the workshops, conferences, and handheld training of the library management software. Kerala State Library Council should provide good infrastructure facilities in the public libraries and conduct conferences, seminars, workshops for the librarians. Library and information science syllabus must include the training sections of the library management software, it will help future librarianship and better library services.

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# Implication of Open Source Software in University Libraries of Uttar Pradesh: An Analytical Study

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## Abstract

The research article is highlights the adoption of open source software and its problems during implication and also focused the major factors of benefits of adoption of open source software in library. For the study, survey research method was used for fulfill the objectives of the study. Questionnaire was used a tools for gathering primary data. The findings of the study, most of the libraries are using open sources software due to easily availability, fewer needs fund, availability of modification facilities.

**Keyword:** Open source software, libraries, Universities, problems, benefits

## Introduction

Libraries are pivotal role played in acquisition, processing, storage and dissemination of information resources for information needier. Library is one of the most important place where not only conservation and preservation of information resources but also generation of new ideas, knowledge, and stimulation of research activities in university campus. it is also leading role played in the increasing of institution raking through providing various products and services and encourage the users satisfaction. Due to drastically development of information communication technology and using of everywhere of its, libraries is not escape from its. Libraries are using information communication technologies for offering ICT based services due to changing users information needs and information explosion. Kushawaha (2018) said that information communication technologies are leading role played to dissemination of information resources to users.

## Objectives

1. To find out the adoption of open source software in libraries
2. To identify the problems of implication of open source software in libraries
3. To examine the benefit of open source software in libraries

## Scope and Limitation

The scope of present study is very concise and precise for the ful fill the objectives of the study. The scope of the study is limited to state and private universities of Uttar Pradesh. The limitation of the study is covered only librarians of the university libraries.

## Research Approach

For the conduction present study, survey research method was used and questionnaire was used a tools for gathering primary data from university librarians of Uttar Pradesh. Total 6 university librarians were taken under taken for the analysis of primary data. The questionnaires were distributed both offline and online due to COVID-19 and lockdown in Uttar Pradesh. 7 questionnaires were distributed, out of them 6 questionnaires were received from respondents. The primary data was analysis through using MS- Excel and data was presented in table as well as figure form as per required for informative way.

## Data Analysis and Interpretation

Table.1 Response rate of questionnaire

| Questionnaire distributed | Questionnaire received | Percentage |
|---|---|---|
| 7 | 6 | 85.71 |

Table.1 shows the response rate of questionnaires. The above table and figure reveals that total 7 questionnaire were distributed out of them 6 (85.71%) questionnaires were received

Table. 2 Gender wise response rate of respondents

| Genderwise response rate | Response | Percentage |
|---|---|---|
| Male | 6 | 100 |
| Female | 0 | 0 |

Table.2 shows the respondents gender wise response rate. The above table and figure reveals that 100% male librarians were held the librarian position in the university library.

Table.3 Adoption of open source software in library

| Adoption of open source software in library | Response | Percentage |
|---|---|---|
| KOHA | 6 | 100.00 |
| NewGenLib | 0 | 0.00 |
| E-Granthalaya | 0 | 0.00 |
| Winsis | 0 | 0.00 |
| Evergreen | 0 | 0.00 |
| Dspace | 5 | 83.33 |
| E-Prints | 1 | 16.67 |
| Greenstone | 0 | 0.00 |

Table.3 shows the adoption of open source software in library. The above table and figure reveals that 100% libraries were using KOHA open source software while 83.33% libraries were using Dspace open source software and 16.67% libraries adoption E- print open source software in library.

Table.4 Using of operating software

| Using open source operating software | Response | Percentage |
|---|---|---|
| Linux | 6 | 100 |
| Windows | 6 | 100 |
| Fedora | 0 | 0 |
| Debian | 0 | 0 |
| Other | 0 | 0 |

Table .4 shows the using operating software in library. The result reveals that 100% libraries are using Linux and Windows operating software in library. The above table reveals that Linux and Windows are most popular software of academic libraries.

Table.5 Problems of implementation

| S,N. | Problems of implementation | Response | Percentage |
|---|---|---|---|
| 1 | Lack of awareness/ knowledge of available Open Source Software | 1 | 16.67 |
| 2 | Lack of technical knowledge to install and maintain Open Source | 5 | 83.33 |
| 3 | Lack of support by management | 3 | 50.00 |
| 4 | Licensing or legal concerns | 0 | 0.00 |
| 5 | Lack of availability of Proper Documentation & training | 6 | 100.00 |
| 6 | Software features/quality issues | 5 | 83.33 |
| 7 | Migration from existing system | 1 | 16.67 |
| 8 | Software cost allocation policies | 6 | 100.00 |
| 9 | Customization | 1 | 16.67 |

Table. 5 shows the problems ofimplementation of open source software in library. The above table reveals that 16.67% libraries were faced problems lack of awareness/ knowledge of available Open Source Software, followed by 83.33% libraries were faces lack of technical knowledge to install and maintain Open Source,50% libraries were faces lack of support by management, 100% libraries were faces lack of availability of proper documentation & training and software cost allocation policies, 16.67% libraries were faces migration from existing system and customization.

Table.6 Benefits of adoption of open source software in library,

| Benefits of adoption of open source software | Response | Percentage |
|---|---|---|
| Available Open Source Code | 6 | 100.00 |
| Easy to install, maintain and modify | 5 | 83.33 |
| Higher Security | 3 | 50.00 |
| No License Fee | 6 | 100.00 |
| Easy to use | 4 | 66.67 |
| Wider Expose | 5 | 83.33 |
| Cost saving | 5 | 83.33 |
| To install various operating system | 2 | 33.33 |
| Exporting and importing facility | 5 | 83.33 |

Table 6 shows the benefits of using open source software in library. The above table reveals that 100% libraries were agreed that the open source software is more beneficial due to available Open Source Code and no need for pay license fee, followed by 83.33% libraries were agreed that due to easy to install, maintain and modify, wider Expose, cost saving, exporting and importing facility, 50% libraries were agreed due to higher security, 66.67% libraries were agreed due to easy to use, 33.33% libraries were agreed due to install various operating system in library.

## Conclusion and Recommendation

Open source software is leading role played in library and information centre's. Due to drastically development of information communication technology and information explosion it is a changing task to managed manually for any types of library. The study reveals that assessing the adopted of open source software in library and during which types of problems faces while implementation of open source software in library. The findings of the study reveals that majority of the libraries are using KOHA and Dspace open source software in library. On the basis of the primary data the study reveals that 100% libraries are facing problems due to lack of availability of Proper Documentation & training and software cost prices allocation and so on. The conducted study reveals that the open source software is more beneficial for library due to easy to installation, wider expose, export import facilities, no licensing fee and so on.

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# Monitoring Students In/ Out Management Using A Smart System At South Eastern University Of sri Lanka Main Library

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## Abstract

The university system in the South Eastern University of Sri Lanka Main Library is concerned with student In/ Out management using a smart system, and it is the responsibility of librarian to monitor students for each In/ Out management using a smart system. By the end of the Month, students get an In / Out management indicating which students In/ Out management using a smart system each faculty wise. Universities have regulated the mechanisms and the acceptable percentages of student statistic. The process for an In/ Out management to manually check students In/ Out management consumes a lot of time and effort, either during the In/ Out management or when in the process of emptying In/ Out management and inserting it into the university's electronic system. Therefore, south eastern university main library. compete to find modern methods of checking check out student In/ Out management that will avoid the disadvantages of manually taking In/ Out management. For this reason, they have produced electronic In/ Out management systems, for example, using a student 's fingerprint, an eye recognition system, or a mobile phone system to read a QR code designed for the same purpose. All of these systems have the disadvantage that they consume a lot of time, as all student have to line up at the fingerprint reader or the eye detector for identification. Therefore, the problem of the consumption of In/ Out management time is still appear, even with these modern systems. Therefore, the aim of this research is to propose a smart system application that is able to check the In/ Out management of student without having to consume library time or require any effort from the librarian. The system automatically recognizes the In/ Out management of student through their university ID cards. The library management system uses proposed system to check the In/ Out management of students instead of using manual method to register the In/ Out management of students and the student' ID cards that are detected by coming within range of the library reader would represent In/Out students, and missing students ID cards represent unregistered students.

**KEYWORDS**: Context Awareness, RFID, Monitoring students In/ Out management.

## 1. Introduction

The main objective of this research is to propose a design for an automatic students In/ Out management system that could be used in universities, or other institutions. The basic infrastructure required by the proposed system includes every library should be provided by a device called smart system. That device could be used by library which made their phones able to deal with RFID technology Student cards will be designed so they can be recognized and readable by the library smart system. A smart system application called RFID Based In/ Out management System had specifically designed for this system. When a smart system in the library consequently the display page will appear. When the students enter the library, there In/ Out management will be registered in the system automatically.

The proposed system would anticipate the presence of librarian in a library based smart system on their library hours. In the case that a student enters a library by mistake, the proposed system able to recognize and inform the library staff about that mistake.

Once the In/ Out management system has been activated by the library staff, the smart system automatically start scanning and recording the presence of students by using their ID cards. The reader would scan and read the students' ID cards. The system would record each student's time to classify the students into three categories: present and on time in front of the names of students In/Out at the beginning of the library, students whose ID cards were not detected by the reader. Since the reader will work from the time of activation by a appear the library until closing hours, the system will record the time of In/ Out management of all faculty students.

## 2. Objectives of The Proposed Student In/ Out Management System

1.Toobtain the percentage of student In/ Out management at the university library level, school library level, and the Public library, while documenting different time periods, from one week to a month to a semester. Studying the statistics for different times may lead to additional research to learn the most appropriate time for students.

2.Toeasily generate lists of regular students, top ten students.

3.To reduce time spent checking student In/ Out management, requiring little effort from the library staff.

Proposed an In/ Out management system that would use fingerprints to monitor the In/ Out management (U. E. Peter,2013) of staff and students. Added teaching idea to assist with keeping the In/ Out management of students on the library by

scanning QR codes (Xiao, Sheng & Liang,2018) via their smartphones, then rewarding them, just like what is used for online computer games.

## 4. Design of the Proposed Checking In/ Out Management System

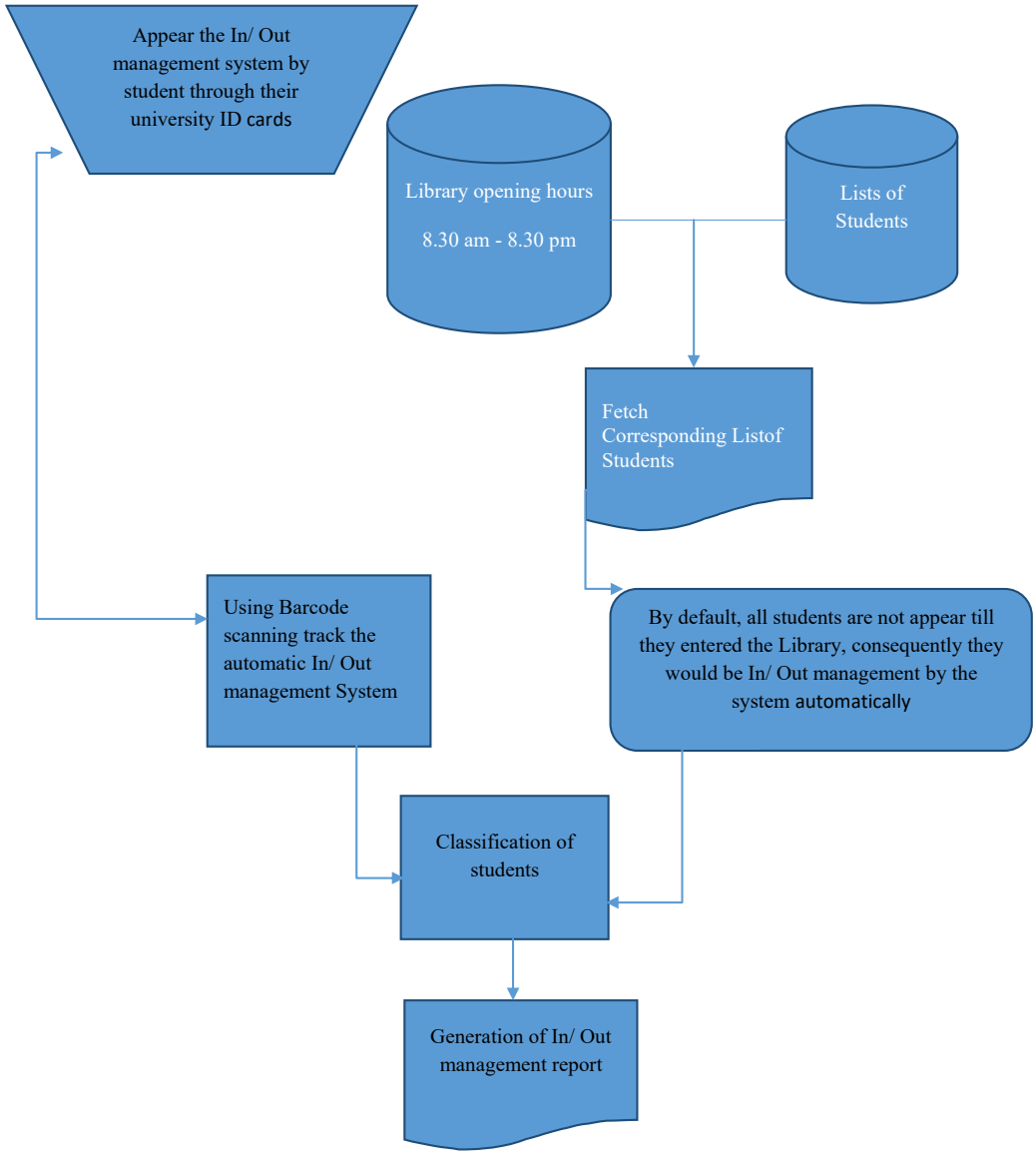



**Figure 1. Flowchart of the structure of the proposed checking In/ Out management system**

The main goal of this research is to propose a smart system that will track student In/ Out management for the applicable statics, without requiring much effort from the library or time from the check in check out in order to implement. The other significant benefit of the proposed system is that it does not require students to line up in front of the reader to register their In/ Out management; the smart system is able to recognize students by detecting their IDs automatically when students enter the library. Students are only required to pass within 3 meters of the security guard desk to be within range of the reader, and registered as appear as a result. As shown in Figure. 1, the library only needs to turn on the In/ Out management system using library systems; consequently, the system would do the task automatically by itself until it generates the In/ Out management report. Once the library management systems log into the In/ Out management system, it will fetch the list of students in the corresponding section from the database in the university's system based on the consistency of the library hours. Then, once the entering the library activates the In/ Out management application, the RFID reader system will monitor the In/ Out management of students who pass within its range. Figure. 2(a) shows the RFID reader that would attach to a library entrance. The RFID tags in Figure. 2(b) represent students' identification cards. Therefore, those student ID cards detected by the reader represent students who are appear, and undetected student ID cards. One significant feature of the proposed system is its ability to detect and register the arrival time and departure time for each student enter the library, so appear students is easily recorded.

## 5. Testing and Exploring the Relevant Components

### 5.1 *The Proposed Rfid Technology*

Any RFID system contains two main components, a reader and tags. The library management system represents the reader, and the students' identification cards represent the tags. The security guard desk in library must have a TURCK device so security guard can use their library management system for the In/ Out management system. The TURCK device allows a system to detect and record the circumstances of each student in the corresponding section by reading their ID cards. The system reads a unique identification number that corresponds to the RFID tag found on each student's ID. The system records the arrival time and departure time for each student when the student enters the range of the reader; an unregistered is noted for students whose ID cards were not detected by the RFID reader.




**(a) Barcode Reader** **(b) Student ID Card**

Figure 2:**(a–b): The system components (RFID reader and tag)**

### *5.2 Testing The Proposed Checking In/Out management- Application*

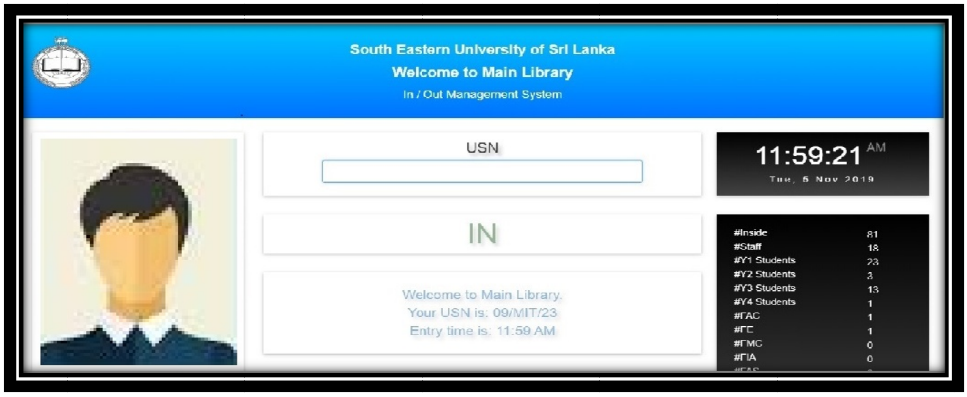
What follows are the real-world tests of the proposed system. The screenshot in Figure. 3(a) shows an Entrance In/Out management systems with security guard desk. Figure. 3(b) appear the display page of the system, which requires the authorized security guard to enter his/her student' ID cards that are detected by coming within range of the library reader access the system. Consequently, the system will fetch and produce a list of students in the corresponding section, and registers all students unregister by default, as seen in Figure. 3(c). Students had their cards scanned and their states changed from registered to unregistered based on their arrival time and departure time enter the library with only their ID cards in their hands, for easy detection by the reader. As shown in Figure. 3(d), In/Out management record.



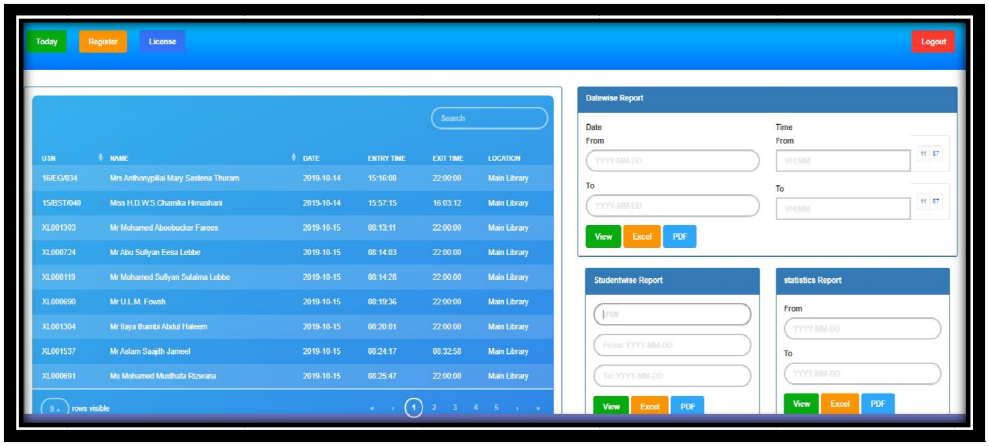
**(c) Students ID card using Barcode reader for *Checking In/Out management system***




**(d)Display *Checking In/Out management system***




**(e) Display user *CheckingIn/Out management system***




**(f) List of *CheckingIn/Out management system***

## 6. Sample In/Out Management Reports Generated by the Proposed System

### 6.*1 In/Out Management System Statistics of Students by Section*

The system will generate In/Out management statistical report taken by newly implemented IN-OUT management system at the main library for the Month of June and July 2019 for all faculty students. In this case Figure. 4 represents the In/Out management Unique Visits by all Faculty Students visited 2848 and Registered Students 4302. Here, Figure. 5 All Visits by Faculty Students total visits 17289.

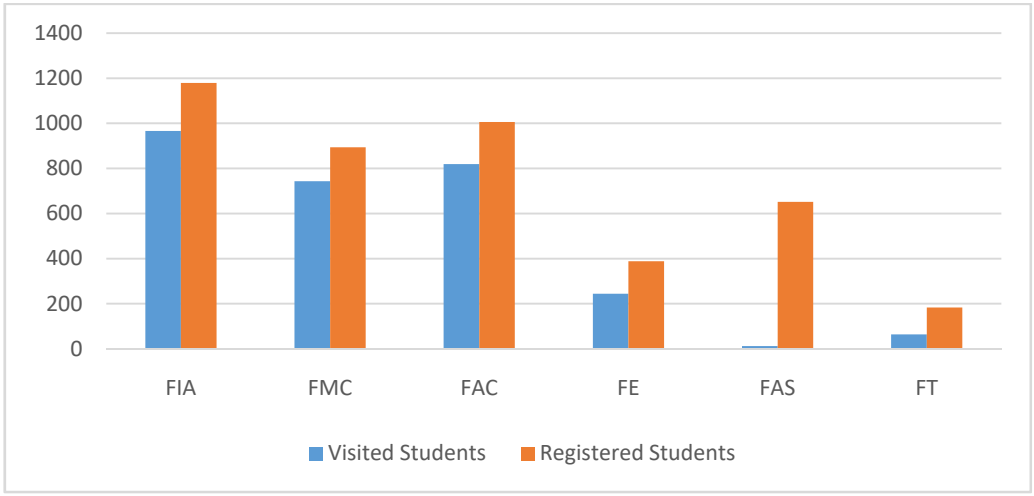



*Figure 4:* ***Unique Visits by Faculty Students***

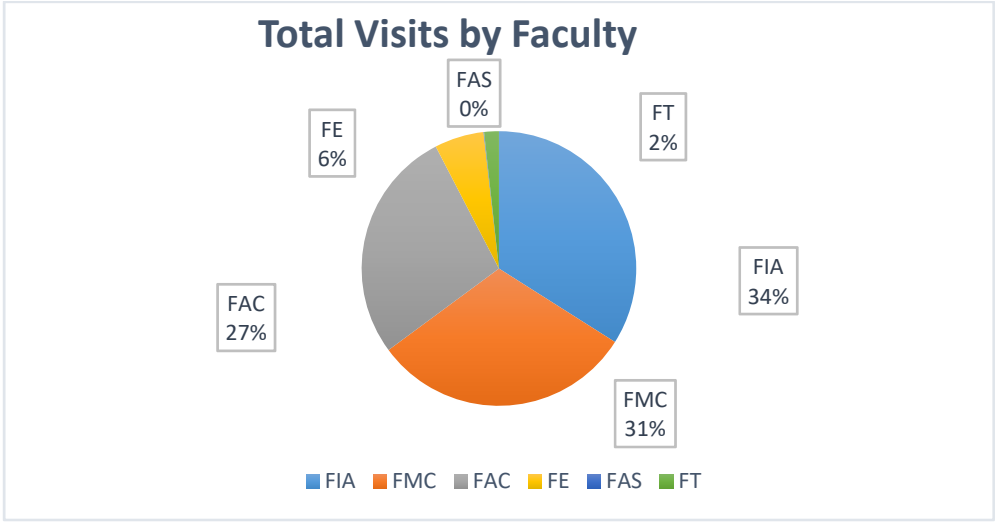



*Figure 5* ***: Total Visits by Faculty wise***

### 6. 2*In/Out Management Statistics of Student by week*

The proposed system could also generate attendance statistics for a student by day, week and month. Table (1) Displays the In/Out management statistics for Month of June 2019 total number of faculty students 4011, who has In/Out management appear on Mondays to Saturday.

## 7. Conclusions

Checking the In/Out management of students using traditional manual methods consumes. However, most available modern solutions have great disadvantages in terms of requiring a high-cost infrastructure or limited functionality. For instance, biometric systems like fingerprint scanners require students to line up in front of the machine for it to be able to serve its purpose, which is not a good solution when considering the library entrance time that is consumed. Therefore, this research proposes an In/Out management -checking system without a high cost and that avoids consuming any time or effort from library opening hours or students. Through this proposed library management system based on RFID technology, a system can monitor the In/Out management of students at a low cost and without the limitations of other available systems.

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# Ict Based Application among the Users of Nilgiris Public Library

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## Abstract

*The availability of the right information at right time, at right place in the right form, to the right Readers is main attraction in the age of Information and communication technology. ICT has created revolutionary in the field of Library and Information Science. This innovative assembly has realized a colossal effect in transit we live, work, think and play. In ICT-the various application are considered as the heart of technology in modern era. To keep this concept in mind, a study has been carried in District Public Library in Nilgiris District. This survey was conducted to investigate the awareness, usage level and application and of ICT. The questionnaire sent to the entire user under study, with particular reference to ICT applications. The data have been presented in tables with their interpretation. The findings are interpreted and a conclusion has been drawn in the lamp light of objectives of the study.*

**Keywords** *Information Communication Technology, Public Libraries, Library Automation.*

## Introduction

According to the UNESCO the term " Information and Communication Technology" refers to forms of technology that are used to transmit, process, store, create, display, share or exchange information by electronic means. This broad definition of ICT includes such technologies as radio, television, video, DVD, telephone (both fixed line and mobile phone), satellite systems, and computer and network hardware and software, as well as the equipment and services associated with these technologies, such as blogs, e-mail and video conferencing etc.

## About the District Public Library in Nilgiris

District Public Library in Nilgiris District Established in 1859, the Nilgiri Library holds rare copies of the Nilgiris and hill tribes and 19th-century British journals. The library has a collection of around 35,000 books and includes old

book, biographies, and various documents for book lovers. In the 19th century the iconic architecture with red brick with milky white stand out far and hold the essence of library within the walls of this district.. Do take a walk around the building easily hidden behind the Cyprus trees while book lovers can visit the library to know more about the history of the region.

## Objectives of the study

1) To know the membership and non-membership of the respondents
2) To know the frequency of using ICT based application in the library
3) To know the utilization of time spent in the library.
4) To know the purpose of using the ICT based application in the library
5) To know the difficulties in accessing the ICT based application the library
6) To know the problem faced in accessing the ICT based application the library
7) To know the availability of Digital library section in the library
8) To know the availability of instant messaging services in the library
9) To know the satisfaction level of the ICT based application services by the respondents in the library

## Methodology

The survey is also analytical in terms of collecting the details on the use of questionnaire method in District Public Library in Nilgiris District. By using questionnaire direct structured interview were carried out to collect the primary data. All the respondents were asked the same questions in the same fashion and they were informed about the purpose of study.

A questionnaire was sent to 120 users of the district public library nilgiris. Most of the respondents filled up the questionnaire, but some of them showed great reluctance. Moreover, it is also essential to collect materials from secondary sources to review the literature on the subject which could further be utilized for purpose for theoretical discussions.

## Analysis and discussion

## AVAILABILITY OF DIGITAL LIBRARY SECTION

| S.NO | STATUS | RESPONDENTS NUMBER | PERCENTAGE |
|---|---|---|---|
| 1 | RURAL | 37 | 33.63 |
| 2 | URBAN | 73 | 66.36 |
| | **TOTAL** | **110** | **100%** |

**Table 1 shows the status of the respondents**

The above table reveals the status of respondents. The male and female respondents altogether in the rural area was in total 37 and percentage level was 33.63 and urban area was in total 73 and percentage level was 66.36.it seems that the respondents in the urban area was more in number compare to rural area.

## Type of the respondents

| S.NO. | TYPE OF RESPONDENTS | MALE | FEMALE | PERCENTAGE |
|---|---|---|---|---|
| 1 | SCHOOL STUDENT | 9 | 3 | 10.90 |
| 2. | COLLEGE STUDENT | 11 | 5 | 14.54 |
| 3. | BUSINESS | 6 | 2 | 7.27 |
| 4. | JOB SEEKERS | 15 | 6 | 19.09 |
| 5. | EMPLOYEES | 13 | 5 | 16.36 |
| 6. | RETD.EMPLOYEES | 24 | 11 | 31.81 |
| | **TOTAL** | **78** | **32** | **100%** |

**Table 2 shows the type of the respondents**

The above table reveals the type of the respondents. Total six type of respondents were identified the school student altogether was in total 12 followed by college students total 16 and business people was 8 and job seekers found to be total 15 and the employees were 18 and finally Retd. Employees were 35. It seems that the Retd. Employees were more in number compare to all categories.

## Membership and non-membership of the respondents

| S.No. | Type of respondents | Membership and percentage | Non member ship | Total | Member ship percentage | Non member ship percentage |
|---|---|---|---|---|---|---|
| 1. | SCHOOL STUDENT | 4 | 8 | 12 | 7.40 | 14.28 |
| 2. | COLLEGE STUDENT | 7 | 9 | 16 | 12.96 | 16.07 |
| 3. | BUSINESS | 3 | 5 | 8 | 5.55 | 8.92 |
| 4. | JOB SEEKERS | 5 | 16 | 21 | 9.25 | 28.57 |
| 5. | EMPLOYEERS | 8 | 10 | 18 | 14.81 | 17.85 |
| 6. | RETD.STAFFS | 26 | 9 | 35 | 48.14 | `16.07 |
| | **TOTAL** | **54** | **56** | **110** | **100%** | **100%** |

**Table 3 shows the membership and non-membership of the respondents**

The above table reveals the membership of the respondents. Among 110 respondents only 54 respondents having membership in the library and remaining 56 respondents were non membership in the library. It seems that more attention to be paid to increase the membership in the library.

## Frequency of visiting the library by the respondents

| S.No. | Type of respondents | Total | Every day | Once in a week | Once in a month | During holi day | Rarely | When need arises |
|---|---|---|---|---|---|---|---|---|
| 1. | SCHOOL STUDENT | 12 | - | 3 | 3 | 2 | 2 | 2 |
| 2. | COLLEGE STUDENT | 16 | - | 4 | 3 | 4 | 2 | 3 |
| 3. | BUSINESS | 8 | - | 3 | 1 | 1 | 2 | 1 |
| 4. | JOB SEEKERS | 21 | 3 | 8 | 6 | 1 | - | 4 |
| 5. | EMPLOYEERS | 18 | - | 2 | 9 | 3 | 1 | 3 |
| 6. | RETD. STAFFS | 35 | 19 | 6 | 5 | 4 | - | - |
| | **TOTAL** | **110** | **22** | **26** | **27** | **15** | **7** | **13** |

**Table 4 shows the frequency of visiting the library by the respondents**

The above table reveals the frequency of visiting the library by the respondents. The frequency of visiting once in a month were considered to be the highest presence by the respondents and followed by the frequency of visiting once in a week.it seems that it is necessary to increase the frequency of visiting the library everyday by the respondents

**Utilization of time spent in the library by the respondents.**

| S.NO | TIME | RESPONDENTS | PERCENTAGE |
|---|---|---|---|
| 1 | 30 MIN | 9 | 8.18 |
| 2. | 1 - HOUR | 29 | 26.36 |
| 3. | 1 – 2 HOUR | 20 | 18.18 |
| 4. | 2 – 3 HOUR | 15 | 13.63 |
| 5. | ABOVE 3 HOUR | 37 | 33.63 |
| | **TOTAL** | **110** | **100%** |

**Table 5 shows the utilization of time spent in the library by the respondents.**

The above table reveals the time spend in the library by the respondents. The time above three hour were considered to be the highest presence by the respondents and followed by the one hour .it seems that the respondents level of time spend in the library by the respondents were considered to be appreciable.

**Purpose of using the ICT based application in the library by the respondents**

| S.No. | Type of respondents | Total | To update know ledge | Career developme nt | Current informati on | Lecture Notes | For research work |
|---|---|---|---|---|---|---|---|
| 1. | SCHOOL STUDENT | 12 | 7 | - | 5 | - | - |
| 2. | COLLEGE STUDENT | 16 | 3 | 4 | 2 | 4 | 3 |
| 3. | BUSINESS | 8 | 3 | 3 | 2 | - | - |
| 4. | JOB SEEKERS | 21 | 7 | 3 | 11 | - | - |
| 5. | EMPLOYEERS | 18 | 8 | 6 | 4 | - | - |
| 6. | RETD.EMPLOY EES | 35 | 15 | - | 20 | - | - |
| | **TOTAL** | **110** | **43** | **16** | **44** | **4** | **3** |

**Table 6 shows the purpose of using the ICT based application in the library by the respondents**

The above table reveals the purpose of visiting the library by the respondents. The updating the current information were considered to be the highest level by the respondents and followed by the updating of knowledge .it seems that the respondents level of time spend in the library by the respondents were considered to be appreciable.

**Difficulties in accessing the ICT based application in the library by the respondents**

| S. No. | Type of respondents | Total | Lack of ict based applicantion | Lack of library staff | Lack of arrangement | Space problem | No comments |
|---|---|---|---|---|---|---|---|
| 1. | SCHOOL STUDENT | 12 | 6 | 3 | 1 | 2 | - |
| 2. | COLLEGE STUDENT | 16 | 7 | 4 | 1 | 4 | - |
| 3. | BUSINESS | 8 | 2 | 3 | 1 | 2 | - |
| 4. | JOB SEEKERS | 21 | 6 | 5 | 3 | 7 | - |
| 5. | EMPLOYEERS | 18 | 5 | 4 | 2 | 7 | - |
| 6. | RETD.EMPLOYEES | 35 | 5 | 5 | 5 | 20 | - |
| | **TOTAL** | **110** | **31** | **24** | **13** | **42** | **-** |

**Table 7 shows the difficulties in accessing the ICT based application in the library by the respondents**

The above table reveals the reason for poor ICT based application by the respondents. The lack of space was considered to be highest level by the respondents and followed by the lack of ICT based components. It seems that it is mandatory to find out the solution for the above said problem by the public library for benefit of the respondents.

**Problem faced in accessing ICT based application in the library by the respondents**

| S.No. | Type of respondents | Total | Slow internet speed | Power supply problem | Lack of guidance | Inadequatei ct based components |
|---|---|---|---|---|---|---|
| 1. | SCHOOL STUDENT | 12 | 4 | 2 | 4 | 2 |
| 2. | COLLEGE STUDENT | 16 | 8 | 2 | 1 | 5 |
| 3. | BUSINESS | 8 | 2 | 2 | 1 | 3 |
| 4. | JOB SEEKERS | 21 | 9 | 4 | 2 | 6 |
| 5. | EMPLOYEERS | 18 | 6 | 2 | - | 10 |
| 6. | RETD.EMPLOYEES | 35 | 6 | 3 | 26 | - |
| | **TOTAL** | **110** | **35** | **15** | **34** | **26** |

**Table 8 shows problem faced in accessing ICT based application in the library by the respondents**

The above table reveals the Problem faced in accessing ICT based application by the respondents. Slow internet speed were opted by the majority of the respondents and followed by the lack of guidance .it seems that .it seems that it is mandatory to find out the solution for the above said problem by the public library for benefit of the respondents.

**Availability of Digital library section in the library**

| S.No. | Type of respondent | Total | Highly useful | Useful | Uncertain | Unavailabl e |
|---|---|---|---|---|---|---|
| 1. | SCHOOL STUDENT | 12 | 3 | 9 | - | - |
| 2. | COLLEGE STUDENT | 16 | 13 | 3 | - | - |
| 3. | BUSINESS | 8 | 4 | 4 | - | - |
| 4. | JOB SEEKERS | 21 | 18 | 3 | - | - |
| 5. | EMPLOYEES | 18 | 7 | 11 | - | - |
| 6. | RETD.EMPLOYEES | 35 | 10 | - | - | 25 |
| | **TOTAL** | **110** | **55** | **30** | **-** | **25** |

**Table 9 shows the availability of Digital library section in the library**

The above table reveals the accessing of ICT based application of E-services of Digital library section. Majority of the respondents opted it is highly useful and followed by moderately useful. It is important to consider that the majority of the Retd.Employees mentioned that they are unknown about this service. It is mandatory to find out the solution for the above said problem by the public library for benefit of the Retd.Employees.

**Availability of the library**

| S.No. | Type of respondent | Total | Highly useful | Useful | Uncertain | Unavailable |
|---|---|---|---|---|---|---|
| 1. | SCHOOL STUDENT | 12 | 4 | 8 | - | - |
| 2. | COLLEGE STUDENT | 16 | 11 | 5 | - | - |
| 3. | BUSINESS | 8 | 3 | 5 | - | - |
| 4. | JOB SEEKERS | 21 | 16 | 5 | - | - |
| 5. | EMPLOYEES | 18 | 5 | 13 | - | - |
| 6. | RETD.EMPLOYEES | 35 | 14 | 21 | - | - |
| | **TOTAL** | **110** | **53** | **57** | **-** | **-** |

**Table 10 shows the availability of the library**

The above table reveals the accessing of ICT based application of E-services of instant messaging services. Majority of the respondents opted it is useful and followed by highly useful.it seems that this service is highly beneficial to the all the respondents.

**Satisfaction level of ICT based application services by the respondents in the library**

| S.No | Type of respondents | Total | Highly satisfied | Satisfied | Somewhat satisfied | Disatisfied | No opinion |
|---|---|---|---|---|---|---|---|
| 1. | SCHOOL STUDENT | 12 | 1 | 2 | 5 | 4 | - |

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| 2. | COLLEGE STUDENT | 16 | 2 | 4 | 2 | 8 | - |
| 3. | BUSINESS | 8 | 1 | 1 | 3 | 3 | - |
| 4. | JOB SEEKERS | 21 | 3 | 7 | 4 | 7 | - |
| 5. | EMPLOYEERS | 18 | 2 | 4 | 8 | 4 | - |
| 6. | RETD.EMPLOYEES | 35 | 2 | 3 | 1 | - | 29 |
| | **TOTAL** | **110** | **11** | **21** | **23** | **26** | **29** |

**Table 11 shows To know the satisfaction level of ICT based application services by the respondents in the library (There is no scaling as per the rule)**

The above table reveals the satisfaction level of the respondents. Majority of the Retd.Employee opted no opinion followed by dissatisfaction. it seems that the Retd.Employee should be motivated and awareness should be given to utilize the ICT based application. The satisfaction level of other respondents should be seriously viewed for better innovation.

## Recommendations

Some suggestions for effective use of E-library services in the District Public Library in Nilgiris District.

- Adequate training (such as for ICT application) should be given to library staff
- The analysis indicated that formal training and user orientation programs are the crucial steps that can facilitate effective use of ICT based services in libraries;
- Library programs should be conducted to make the users aware of the library services.
- Friendly atmosphere should be created to attract more research scholars.

## Conclusion

The purpose of present study was to examine the use of ICT based library services and its impact on users to show that the public library and its collections It is also seen that majority of users visited the library as when needed and the distance is a major factor for not visiting the library more frequently. Large majority of the users agreed that there is need for workshop/orientation programs on the use of ICT based resources and services. Therefore, it is quite inevitable on the part of the

public library authority and the librarian to market the latest e-resources and services among the users so that they can explore potential resources quickly, easily and comfortably. Once, the trend of using electronic service becomes faster, it will surely promote valuable.

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***Web resources***

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# Importance of Information Technology (IT) Services in Engineering College Libraries

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## Abstract
*Information technology (IT) is a term that describes the technologies that are used to collect, process, store, retrieve, and disseminate recorded data. In academic libraries, information technology (IT) has revolutionised information handling. The impact of information technology on engineering college libraries must be evaluated and measured. It was discovered that the employment of information technology in engineering college libraries are still insufficient. This article highlights the importance of information technology in improving the state of the engineering college libraries under investigation. This study also discusses the issues that arise while using information technology and offers some solutions for the same.*

## Keywords
*Information Technology, Engineering college libraries, OPAC, E-resources*

## Introduction

Information is a vital resource for any organization's advancement and development. Academic libraries in engineering colleges are well-known information institutions that play an important role in meeting users' information demands. Engineering education is a skilful, artistic, and productive learning experience. Technical education is critical to our country's social and economic development. Engineers demand the most up-to-date information in their fields in order to support their learning, teaching, and other research requirements. To address the information needs of their users, library professionals working in these institutions should prioritise acquiring acceptable and need-based literature in those subjects. It is critical for the development of engineering institutions to identify the

information demands and patterns of users of information resources, facilities, and services.

The influence of rapid technological advancements on engineering college libraries has been tremendous. Electronic information products include DVDs, networks, the Internet, communication devices etc. Electronic security systems and other compatible technology are employed in libraries. For library automation and the establishment of an electronic database of library assets, the computer is the first and most essential IT component that can be implemented in an Engineering college library. Networking, multimedia, and the Internet are some of the other important technologies that can be used to improve information access. The current technological difficulties that academic/technical libraries are addressing: The library automates acquisition, cataloguing, circulation, serials control, the online public access catalogue (OPAC), and other library services.

In India, information handling activities in research and academic libraries have been revolutionised by information technology (IT). The rapid improvements in technology have substantially helped engineering college libraries as centres of information services. The implementation of information technology (IT) tools in the day-to-day activities of engineering college libraries in India is at various stages of development. INFLIBNET—through a variety of initiatives, a University Grants Commission (UGC) Inter University Centre has taken on the duty of assisting engineering college libraries across the country with a focus on UGC-Infonet E-Journals Consortium Initiatives.

The internet has become an inseparable aspect of today's engineering educational system. With the advancement of internet and information technology, an increasing number of educational resources are produced, distributed, and are now accessible in digital format. For better use of their information resources, web designers, publishers, and distributors should include an online assistance menu in the search page. The internet's speed should be enhanced, and technical institutions should hold regular seminars, workshops, and orientation programmes for students to keep them up to date with the latest technologies. The virtual world's electronic resources represent a significant commitment of people's time, money, and wisdom. Users should be made familiar with the most recent search techniques to get the maximum use out of the electronic information resources available.

## Objectives

1. To find out the availability of information technology resources and services in the Engineering college libraries.

2. To know the effective use of information technology facilities by the users in the Engineering college libraries.

3. To learn how IT skills can be used by LIS professionals to modernise libraries.

4.To know the users' level of satisfaction on library resource services by using the information technology in engineering college libraries.

5. To Identify the problems while using the information technology in engineering college libraries.

## Problem statement

IT has now become an integral component of most people's daily lives. It is necessary for every job, including the library profession. Libraries currently provide great services to their users thanks to advances in information and communication technologies. As a result, the younger generation is known as the digital generation, and they are quite comfortable using information technology (IT) in both their daily lives and educational pursuits. Information is needed by everyone including the students, the faculty and researchers to enhance their academic performance. Many times, users visit the library, but they are not satisfied with the library resources and services due to a lack of the use of information technology knowledge. The problem selected in this study is: importance of information technology (IT) services in selected Engineering College libraries.

## Scope of the study

For this study, students at engineering colleges are taken into consideration. The target respondents in other colleges are not included. There is a scope for other future researcher to take this area for their study.

## Research Methodology

We will use two types of research methods in this proposed study: primary and secondary. The secondary sources data include books, reference books, journals, Magazines, Newspapers, Research articles, Thesis etc.

## Engineering College Libraries

Engineering college libraries, like all other college libraries, are affiliated with institutions that contribute first and foremost to the teaching and learning process by providing a variety of information and learning resources to patrons to persuade them to enrol in the institution's course programmes. The AICTE has established detailed guidelines for libraries at engineering colleges that offer a variety of technical disciplines. Libraries oversee selecting, preserving, and organising their

collections, as well as disseminating material or information resources appropriate for their institutions' clients.

Libraries, as learning centres, play an important role in sustaining and meeting the information needs of parent institutions. Libraries must be planned and developed in a systematic manner to ensure the efficient, effective, and scientific development of information resources and services. As the body of literature grew, so did the demand for up-to-date knowledge. The twentieth century is setting the way for the next millennium, which are only a few years away. Scientific research must play an important role in this age of science and technology since the advancement of the same is the key to academic and economic prosperity. It is high time for engineering institutions to focus on a programme to promote and support information technology through an interconnected network that only serves the interests of users. Information consumption has increased at a faster rate, with a broader global reach, particularly in the technology field. The library should be able to provide complete, timely, and cost-effective access to scientific material, which is the very foundation for scientific development.

## E- Resources

The way individuals work has changed dramatically during the previous years. Alterations in technology, such as the advent of computers, the addition of telecommunications, and the rise in popularity of the Internet, have caused the changes. These advances are on-going and are primarily significant in that they provide people with access to vast volumes of information at home or at work. Once preserved in digital form, information can cross all physical and geographical barriers to reach the farthest reaches of the earth. Electronically preserving and processing vast volumes of data is becoming a reality thanks to new technology. On an almost daily basis, new methods for getting information emerge. The necessity of the hour is access to the appropriate information at the right moment. A user can access many sorts of information at various levels, ranging from resources available at a library or information centre to network-based information services from various networks.

## E-Resources in Engineering Colleges

Any engineering college library's information resources can be divided into two categories: print and electronic. Print form books, hardcopies of periodicals, back volumes of periodicals, question papers, reports, directories, project reports, newspapers, newsletters, and so on are some examples of print form books, hardcopies of periodicals, back volumes of periodicals, question papers, reports, directories, project reports, newspapers, newsletters, and so on. Engineering college

libraries are purchasing or subscribing to electronic resources in addition to print versions for a variety of reasons. Librarians are acquiring electronic resources to meet the information demands of users because of the introduction of information and communication technology. The concept of providing consumers with information has shifted from information availability to information access. As a result, library personnel have no other choice but to use electronic resources. Electronic resources offered several benefits that compelled librarians to include them in their collections. E-Books, E-Journals, E-Databases, E-Magazines, E-Lectures, E-Conference Proceedings, E-Audios, E-Images, E-Music, E-News, E-Subject Guides, E-Newsletter, E-Reports, and E-Directories are some of the e-resources available in engineering institutions.

## The Impact of Information Technology (IT) on Libraries and Librarians

The computer has had a significant impact on library and information usage. In libraries, information technology has aided librarians in providing higher-value information services and allowing for more remote access to internationally available information resources. Today's advanced information technology allows for the storage of large volumes of data or information in a small amount of space. Information technologies promise quick access to stored data and are revolutionising our understanding of what a classic library and a modern information centre are for.

Recent technological advancements have drastically altered the way libraries operate and provide services. Modern information technology is having an impact on libraries and the information profession in general. Digital information sources and digital media are replacing and becoming the dominant method of information storage and retrieval as a result of advancements in IT and widespread usage of IT. IT also survives and creates authentic Library Science norms such as "Every reader his/her book/information," "Save the reader's time," and "Library is a growing organism." IT, with its vast information sources, fast transmission speeds, and easy accessibility, ensures that users with complex demands are satisfied, that distance barriers are broken down, that time is reduced, and that the correct information is delivered to the right reader at the right moment.

It also meets and exceeds the library's collection development demand. It's a fantastic resource for library information centres.

## Information Technology (IT) Services for User

User Services Provided by IT Some library users are developing electronic habits, increasing their use of new technology such as computers, the Internet, the Web,

Intranet, Extranet, and other systems. As a result, library patrons are making new expectations on their institutions. They need access to the most up-to-date information, as well as current information resources and IT facilities that they may utilise in their work. The usage of technology in libraries improves user satisfaction. It has a lot of advantages for library patrons. The following are some of the advantages:

• Provides users with remote and easy access to information.

• Provides users with access to unlimited information from various sources

• Provides information flexibility for any individual to use according to his or her needs

• Facilitates the reformatting and combining of data from various sources.

**Libraries also offer a variety of IT-related services to their patrons, including the following:**

• Web access to OPACs

• Electronic document delivery

• Access to networked information resources

• Information delivery to user desktops

• Online instructions

• Online readers' advisory services

## Findings

Most of the users want to use libraries for research.

Many users are using electronic resources regularly.

Most users visit the library for electronic resourcesand utilise it to enhance their knowledge.

Many users prefer to download information from the Internet in Word, PowerPoint, and PDF formats for their studies.

## Conclusion

The study shows that most users are interested to get the information from friends, colleagues or the Internet as their primary source of information. Textbooks, newspapers, periodicals, and online journals are also reported to be the most essential information resources among the users. CD/DVD ROMS, conference/seminar proceedings, and project reports are considered the least

essential information resources. The users believe that the existing engineering college library collection lacks sufficient information resources. The biggest issues with finding information resources are a lack of time and access to computers with IT infrastructure. Most users stated that they face difficulties while searching for required information on their own due to lack of training in the areas of library resource and service awareness, and of the usage of the library catalogue/OPAC. According to the conclusions of this study, people seek knowledge for a few reasons, including personal and professional ones. The type of library collection has a significant impact on the success of a library's functioning. Users' demands and criteria should be met by the collection. As a result, librarians must understand how students search for information. It is critical to understand user information demands and information-seeking behaviour to build a meaningful collection and improve facilities and services.

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# The Role of ICT in provision of Library Services

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## Introduction

Information Communication Technology (ICT) has remained a catalyst in the issue of national advancement and development. Information, as power is effectively an infinite resource and avital tool needed for the development to fall sectors in any nation. It is therefore, imperative that application in libraries would go a long way in satisfying the information need of the citizens. It is worthy of note, that the emergence of ICT has impacted greatly on the quality of information provided through libraries. It also enables proper and adequate provision of library services to library users from all disciplines. In this 21st century, the drastic role of ICT in library operation scan not be over emphasized. Many library routines and operations that were initially performed manually are now being converted to computerized operations which means, applications of ICT techniques to providing better and faster services to the end users. A nation without functional libraries and information centres may lack access to information that would enable her sustainable development. In this era of globalization, in which the world is connected, information gains its power through permanent storage and wide distribution, which could be achieved through ICT. According to Janakiraman and Subramanian (2015), the world now experience a digital scenario in which ICT has changed the possibilities of the library job promotions and has brought changes to expected library performances.

## Information Communication Technology (ICT)

ICT is a generic term that refers to the technologies that are used to collect, store, edit and communicate information in various format (Raji, 2018). The use of ICT improves access to digital information, narrows down the digital divide and also improves standard of living. Adoption of ICT in libraries is a way of improving on information services provided in libraries. This is an era, when people need to access timely information with ease, and this can only bed

one through the application of ICT to library services. It is also away of contributing to sustainable development of the nation, since timely and effective provision of use full information can assist in building up a society ICT as an enabling tool, assist libraries in provision of information, which is very paramount to development of the various sectors in the nation. Libraries are playing a very important role facilitating access to global information and knowledge resources, using ICT.

Apparently, ICTs are indispensable tools needed for provision of value added information that support the sustainable development. Although, many institutions and organizations including libraries face diverse challenges in the process of integrating ICTs to their services. Nevertheless, information provision is paramount to development and growth of any nation. It is therefore important that, effort is made to enable usability of ICTs in all sectors, of the nation ICT and library services.

Information and communication technology is the application of technologies consisting of hardware, software, network and media for collection, storage processing transmission and presentation of information in vocal, textual, pictorial and multimedia formats, (Igwe, 2011). ICT is a term used in the library to refer to application of computers and other technologies to library practices such as acquisition, storage, organization and dis semination of information. The world has become a global village and with ICT, many library users now have access to vast sea of information, without necessarily investing much time or energy. The process of generally and distributing information is now being facilitated through the use of ICT.

Aina, Okunnu and Dapo-Asaju (2014) postulated that ICT is a term used to describe the ability to access information with the use of tele communication based internet resources. ICT provides the ability to create, organize, manipulate and access information from remote locations across the globe, within a short time. ICT involves incorporation of a range of technologies that are used to support communication and information dissemination. Saidu, Tukur and Adamu(2014)described ICT as the use of computer-based technology and internet for making information and communication services available to a wide range of users.

The term is broadly used to refer to arrange of technologies including telephones, e-mail and soon. Central to the range of technologies is the internet, which provides the mechanism for transporting data in a number of formats such as text, images, sound and video. ICT is system that enables information to be collected, analyzed, processed and disseminated.

Olise (2010) opined that information communication technologies (ICTs) are new technologies that cannot be ignored in Africa. He further

identified that ICTs are significant tools that must be employed to achieve and sustain development.

The advent of ICT is indeed a boost to the library services as it now assists many librarians to use their ICT potentials to reach out to library users. Chisenga (2004) identified some of the ICT-based services that are provided by libraries as follows:

- **Provision of web access to OPAC:** Libraries are providing access to web-based Online Public Access Catalogue (OPAC) interfaces. The OPAC makes it easier for users to access and use information resources. OPAC is the computer form of library catalogue, to access materials in the library (Afolabi and Abidoye, n.d.)

**Electronic Document Delivery:** Libraries implement ICT-based interlibrary lending system, through the use of electronic networks for documents delivery. In essence, the Document Delivery Service (DDS) enables a library to use copies of research papers or other research document, from other libraries. These documents could be journal articles or other documents
in digital format. They are mainly in portable document format (PDF) and they delivered to library users' desktops.

- **Online Instruction / User Education:** There is implementation of online based bibliographic or library user programmes such as online tutorials on searching online resources and virtual tours of library collections. Libraries can also use internet or CD-Roms to educate users.
- **Online Readers Advisory Services:** Libraries now implement web-based versions of reader's advisory services to include informing users about new acquisitions, provide reviews and recommendations and so on in using the web.
- **Networked Information Resources:** Libraries now provide users with access to networked information such as database, electronic scholarly journals and other publications from various publishers.

**Reprographic Technology:** These are widely used in libraries globally. Reprographic machines are provided in libraries to ease photocopying of documents on demand.

**Library Retrieval System:** This involves the use of compact disc read only memory (CD-ROM), a technological mechanism for acquisition of specialized CD-ROM databases in various discipline such as law, sciences, medicine technology, agriculture, humanities and soon.

**Indexing and Abstracting Services:** It is a service that is carried out to provide summaries of documents and also to assign descriptors for referencing documents.

**Institutional Repositories:** It is an online archive for collection, preservation and dissemination of digital copies of the intellectual output of academic or research of institution, this could be journal articles as well as digital versions of theses and dissertations. This service is mostly provided in academic or research libraries.

**Document Scanning Services:** Scanner is important equipment in modernization of library. It is useful for scanning text, image and content page of books and providing great help for establishing digital and virtual library.

## Benefits of ICT in Libraries

Globalization driven by ICT is presently having phenomenal impact on library practices ICTSs are significant and useful tools for sustainable development in all fields and all aspects of our society. ICTs provide means to actualizing developmental goals in education, health, agriculture, business and commerce among others. According to Olise (2010), the introduction of ICTs in education had brought about computerization of traditional materials such as books, journals newspaper and other information resources in the library. This has also led to the existence of virtual library. Educational researchers, through the use of ICT can access current literature materials with ease. ICTs also encourage collaboration among researchers irrespective of their locations.

Internet provides up-to-date information on any subject. Likewise, earlier research findings can be easily accessed through the internet. In the area of agriculture, ICTs are being used to provide farmers with information as regards their plants and animals, which will eventually improve their productivity.

On professional duties, computers are used to automate different manual functions. Acquisition, cataloguing of library materials, circulation, cataloguing of library materials, circulation and serials management are now automated in libraries, using available software in the market. ICTs enable libraries to locate store, retrieve and disseminate information. ICT tools such as CD-ROM, e-mail are used in libraries for dissemination of information. In addition, digitization of information resources which involves converting print resources to electronic form is also carried out, using ICT.

Other benefits of ICT in libraries as stated by Ashikuzzaman (2014) include:

- Provision of speedy and easy access to information.

- Provision of remote and round the clock access to users.
- Provision of access to unlimited information from different sources.
- ICT enable easier, faster, cheaper and more effective library operations.
- ICThelpstomanageinformationoverloadasinformationretrievalismadeeasierin computerizedsystems.
- Computerization helps the library to save space and reduce paper.

## ICT Resources in Libraries for Sustainable Development

ICT as aggregate of computers, telecommunication gadgets, multi-dimensional resources and other related technologies are applied and utilized in the total process of information management and dissemination. The various components of ICT have provided a face lift for the support of varying professional services. Nwabueze and Ozioko, (2011); Umana(2018) identified the following primary ICT resources as imperative in actualizing Nigeria's sustainable development goal. Likewise, the same ICT resources are paramount to effective delivery of library services. The ICT resources include:

1) **Computers**: These are essential management tools which can be used to handle different operations more efficiently. Computers can be used for various activities such as information generation, processing, storage, analyzing and information dissemination for sustainable development. The use of computers in the library is noted with great assets such as speedy information transmission, cost effectiveness and optimal utilization of available resources. Other computer accessories include CDs, Flash drive and so on. The computers are used to perform various library operations and routine such as ordering/acquisition, circulation e.t.c.
2) **The Internet:** This ICT resources is a means to speedy flow of information. It is a network of computers, communicating with others, often via telephone line. The internet provides a worldwide platform for information sharing among individuals, institutions and organizations. The use of internet enables the provision of current and useful information to enhance productivity and good governance.
3) **Electronic Mail (E-mail):** This is the most widely used resource of the internet. It is used for sending and receiving of messages otherwise known as mails. The messages are communicated through electronic device. E-mail enables faster and cheaper organizational communication.
4) **World Wide Web (WWW):** This is also an internet-based resource. Websites help individuals, organizations or institutions find products or information and transacts business. Relevant information is made available

to members of the public through the websites of many organizations or institutions. Being on the web, places any nation or organization on the right cause of speedy and sustainable development in line with emergence of changes in technology, economic and political area.

5) **Video Conferencing:** This enables people at different locations to hold conferences by data communication network. It is convenient and less expensive for conducting a conference between two or more participants situated at different remote location (Mishra and Mishra, 2014).
6) **Printing Technology:** A printer is a device that converts computer output into printed images. There are different kinds of printers used in library. They include Laser printer, Inkjet Dot-matrix printer and so on.
7) **Online Public Access Catalogue (OPAC):** It is the computer form of library catalogue to access information materials in the library. It is an online database of materials held by a library or group of libraries. It is a computerized library catalogue made available to the public. Most OPACs are accessible over the internet to users all over the world (Mishra and Mishra, 2014).

**The Role of Library in the provision of Information for Sustainable Development**

Information is a vital tool for development and there is no nation that can experience developmental sustainability without continuous flow of relevant information. Libraries are majorly concerned with the acquisition, organization, dissemination and preservation of information to educate and enlighten the citizens. The development of any nation depends on provision of relevant, adequate and timely information on education, security, health and soon. Access to such information are provided in various formats through the libraries.

Library is a place where knowledge is created and shared. It is a storehouse where knowledge in various formats, be it print or electronic is preserved. There are different kinds
of libraries which include academic, school, public, national and special library. The library, irrespective of its kind perform various roles. According to Afolabi and Abidoye (n.d) the primary role of the library is to provide information service to support the educational, recreation, cultural, economic and technological endeavours of members in their respective communities. It's no doubt that library is one of the organizations that can help the nation to achieve and sustain development. Library also, cannot fulfill this obligation if it continued to rely on the traditional methods of disseminating information. Therefore, there is need for libraries to employ reliable and potential tools like

internet and other information and communication technologies (ICTs) to support, economic social and political sustainability.

Olise (2010) simply put sustainable development as developing for the present and future. It is the process of ensuring that the present development is sustained and maintained for the future. Sustainable development focuses on the need to build the nation for the future, through the process of improving the citizens' lives for the future. Adejumo and Adejumo (2014) viewed sustainable development as efficient management of resources for human survival taking into consideration both the present and future generation.

To achieve sustainable development in a globalizing world, there is need for timely information that will leads to the right decision making and that will inform certain actions. The digital divide must be bridged to enable easy accessibility to information by the citizens.

Bradley (2014) affirmed that libraries contribute to sustainable development. The libraries provide access to data and knowledge that support informed research which is instrumental to achieving sustainable development goals. ICT has paved ways for libraries to use ICT creatively in order to enhance service delivery to the users.

## Challenges of Using ICT for Provision of Library Services

There is awareness that a lot of benefits are derived, through the adoption and use of Information and Communication Technologies (ICTs) in libraries, nevertheless, there are many challenges to bead dressed. These include:

- **Limited Financial Resources:** The acquisition and maintenance of the relevant equipment depends on the availability of fund. Mostly, there is paucity of funds in many libraries in Nigeria there by, leading to inability to acquire, the necessary ICTs that would enable them connect to the internet, make subscription to various online database and obtain software licenses.
- **Shortage of ICT Facilities and ICT Skills:** The computers are used to receive and store large volumes of information. Likewise, the internet accessibility is made possible through the use of computer, they are used to access Online Public Access Catalogue (OPAC) and also to perform many other routine activities in the library. Shortage of computers and other facilities remains a big challenge to many libraries. Many librarians also lack the ICT skills and this makes it difficult for them to embrace technological innovations. Lack of ICT skills places a serious restriction on the application of ICT to provision of library services.

- **Lack of ICT Policies:** There is lack of systematic ICT policy in developing countries and it impedes the deployment of ICTs (Afolabi and Abidoye, n.d).
- **Poor maintenance of ICT Equipment:** Many libraries do not have space and conducive environments for keeping ICT equipment. In addition, most of the ICT equipment are not adequately maintained in most libraries as a result of the maintenance cost which is usually very high. Also, as a result of lack of maintenance culture.
- **Erratic Power Supply:** In developing countries, large areas are still without a reliable supply of electricity (Said, Tukur and Adamu, 2014). Other challenges are;
- Insufficient bandwidth.
- Lack of technical IT knowledge by library staff.
- Constant change of software and hardware.
- Copyright and intellectual property right management.

## Conclusion

Application of ICT to provision of library services is a crucial effort towards sustainable development of India Therefore, for libraries to remain agents that will facilitate sustainable development, efforts must be made to provide the right information at the right time. With the ICT in place, the objectives of libraries will not only be achieved but it will also help libraries to compete with their counterparts in the developed world. Developing countries like India must also recognize ICT as key strategic tool for sustainable development. Organizations,
Institutions including the library must be supported and encouraged to embrace and utilize ICT for efficient and effective delivery of service.

## Recommendations

Based on the conclusions above, it is recommended that:

1) Fund should be provided to libraries on regular basis. All libraries, irrespective of the type need strong financial support from the parent organization.
2) The librarians must become higher system thinkers and fully equip themselves to work in digital and computer environment.
3) Policies that would encourage the deployment and development of ICTs in all institution should be formulated and implemented for the nation's development to be sustained.

4) Training and retraining of all categories library staff should be organized on regular basis. The ICT largely depends on ability of staff to operate ICT facilities. The training should include needed skills and techniques for data input into the computer, internet surfing and using different telecommunication facilities to exchange information.

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# THEME 8

# Information Literacy, Best Practices and others

# Information Literacy among postgraduates engineering students of Osmania University, Hyderabad: A Study

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**Abstract**
Information literacy (IL) is a buzz word in libraries and information centers. The Users of the libraries and information centers has to be information literate. They are able to recognize when information is needed and they should have the ability to locate, evaluate, and use effectively the needed information. The present study is carried out by distributing a questionnaire to postgraduate students of University college of Engineering, Osmania university. The main objective of the study is to find out the information literacy skills of PG students of engineering faculty. The findings of the study shows the majority of users want information literary programs.

Key words: *Information Literacy. Engineering, Osmania University, Hyderabad*

## 1. Introduction

Information literacy (IL) is a buzz word in libraries and information centers today but as a concept it is used in United States since the early 1990s. Zurkowski (1974) was the first to use the concept of information literacy: "People trained in the application of information resources to their work can be called information literates. They have learned techniques and skills for utilizing the wide range of information tools as well as primary sources. According to ALA's (1989) definition To be information literate, a person must be able to recognize when information is needed and has the ability to locate, evaluate, and use effectively the needed information.

## 2. Study area:

University college of Engineering, Osmania University, Hyderabad has seven departments. The University Library and College of Engineering library and Department Libraries procures and stocks science books and journals and E

resources to serve the requirements of all users belongs to different branches like Computer Science, Biomedical, Civil, Electrical, Electronics, Mechanical and Mining Engineering etc. The Engineering College library of the Osmania university caters to the needs of about 3500 users comprising Post-Graduate students, Doctoral candidates (Regular and Part-time), teaching and Non-Teaching Staff.

## 3. Objectives of the study:

The Following are the main objectives of the study:

i) To find out information literacy skills of PG Students
ii) To find out purpose of using information.
iii) To find out tools used to locate information
iv) To find out search patterns
v) To find out need for information literacy programmes

## 4. Methodology

A questionnaire was used to collect the data from the Postgraduate students belongs to different branches of Engineering College, Osmania University. The questionnaire covers areas like frequency of library visits , purpose of information use, awareness about E resources, tools used to retrieve information, search strategies, methods of Information literacy programmes needed etc. 200 questionnaires were distributed among the postgraduate students randomly and out of these, the investigator got 185 filled in questionnaires.

## 5. Data Analysis:

The collected data related to information literary skills has been analyzed and presented in following tables.

*Regular Library visits*:

Generally Students visit the libraries to get information to pursue their careers and study

Table 1: Library visits

| S.No | Regular Visits | No. of Respondents | Percentage (%) |
|---|---|---|---|
| 1 | Yes | 67 | 76.13 |
| 2 | No | 21 | 23.86 |

The data in the (table.1) shows that 67(76.13%) visiting libraries regularly and 21(23.86%) are not visiting the libraries regularly. This indicates that majority students visiting the libraries regularly to get information.

*Purpose*:

Every user visits library or information centres for different purposes to fulfill his information need.

Table 2: Purpose of using information:

| S. no | Purpose of information use | Respondents | Percentage (%) |
|---|---|---|---|
| 1 | To prepare assignment | 14 | 15.90 |
| 2 | To prepare exams | 44 | 50.00 |
| 3 | To write research project | 15 | 17.04 |
| 4 | To improve knowledge | 10 | 11.36 |
| 5 | To prepare articles | 05 | 5.68 |

The above data in the (table. 2) shows that 14 (15.90%) respondents using information with the purpose to prepare assignments, 44 (50%) respondents use information to prepare exams, 15(17.04 %) to write research projects. While 10 (11.36%) use information to improve knowledge. However 05 (5.68 %) using information for preparation of articles/ papers. The data indicates majority using information to prepare for exams and to improve their knowledge.

*Time spent in the library*:

Users spend time in the library to read or collect information. The below table shows the time spent by students in the library

Table 3: Time spent in the library

| S. No | Time spent | Respondents | Percentage |
|---|---|---|---|
| 1 | One Hour | 8 | 9.09 |
| 2 | 1-2 Hours | 19 | 21.59 |
| 3 | 2-3 Hours | 40 | 45.45 |
| 4 | 3-4 Hours | 21 | 23.86 |
| | | | |

Data in the (table .3) shows that 8 (9.09 %) users spending one hour time in the library and 19 (21.59%) respondents spending their time between 1-2 hours. 40 (45.45%) users spending time 2-3 hours in the library while 21 (23.86%) respondents spending 3-4 hours. The data reflects that majority 45.45% spending their time in the library between 2-3 hours

*Awareness about E resources*:

Library disseminate information in the form E resources, the following table shows the awareness of students about E resources

Table 4: Awareness - E resources

| S. No | E Resource | Respondents | Percentage (%) |
|---|---|---|---|
| 1 | Ejournals | 55 | 62.5 |
| 2 | Online databases | 37 | 42.04 |
| 3 | E books | 49 | 55.68 |
| 4 | UGC-INFONET | 46 | 52.27 |
| 5 | Digital libraries | 39 | 44.31 |

The above data in the (table.4) shows that 55(62.5%) aware about E journals, followed by 37 (42.04%) know about Online Databases. 49(55.6 %) users aware about e-books, 46 (52.27%) aware about UGC-INFONET. Digital libraries known to 39 (44.31%) respondents. The data indicates that majority users were about E journals and E books.

*Usage of tools to locate information*:

Users use different tools such as OPAC, Browsing shelves, asking librarian etc for locating information. The following table depicts the tools that are used by respondents for locating information.

Table 5: Usage of tools

| S.No | Tools -used | Respondents | Percentage (%) |
|---|---|---|---|
| 1 | Using OPAC | 35 | 39.77 |
| 2 | Assistance from library staff | 27 | 30.68 |
| 3 | Browsing the shelf | 32 | 36.36 |
| 4 | Seeking assistance from teachers/friends | 41 | 43.59 |
| 5 | Self learning | 55 | 62.5 |
| | | | |

The data in the (table .5) shows that 55 (62.5 % ) locating information by self , 32( 36.36%) of respondents browse shelves, 27 (30.68% ) seeking assistance from the library staff. 35(39.77%) respondents have been using OPAC to locate information while 41(46.59% )respondents seeking assistance from friends and teachers to locate information

The data reflects that majority users locate by self learning it means on their own and 46.59% by seeking assistance from teachers and friends.

*Computer Skills known*

Today information is available in the digital form to access the electronic information user should have some computer skills. The following table shows the computer skills of the users

Table 6: Computer skills

| S.No | Computer skills | Respondents | Percentage (%) |
|---|---|---|---|
| 1 | Download | 78 | 88.63 |
| 2 | Internet browsing | 88 | 100 |
| 3 | MS office | 46 | 52.27 |
| 4 | HW/SW | 35 | 39.77 |
| 5 | Multimedia | 29 | 32.95 |
| 6 | Keyboard typing | 42 | 47.72 |

The data in the above (table.6) depicts the computer skills of the respondents for accessing digital sources. It shows that 88 (100%) had Internet browsing skill followed by 78(88.63%) had download skill and 46 (52.27%) of respondents had knowledge of MS office, 42 (47.72) had skill of keyboard typing and, 29 (32.95%) had multimedia skills and 35(39.77%) had HW/SW skill. It indicates that majority respondents had internet browsing and information down load knowledge.

*Sources - digital information*

Users use different sources such as Google, databases etc to find digital and electronic information available on internet. The following table depicts sources used to find digital information by respondents

Table 7: Sources to find digital resoures

| S.No | Sources | No. of Respondents | Percentage(%) |
|---|---|---|---|
| 1 | Google | 80 | 90.9 |
| 2 | Online Bib databases | 42 | 47.72 |
| 3 | Subject gateways | 28 | 31.81 |
| 4 | Websites | 56 | 63.63 |
| | | | |

The data in the (table 7) shows that 80 (90.9%) find information via Google, 42(47.72%) respondents use online bibliographical databases, 28 (31.81%) respondents get digital information from the subject gateways. 56 (63.63%) respondents have been used different websites to find digital information.

*Tools used to save digital information:*

Digital information accessed from internet or from any sources can be saved by students by using different tools such as pen drive, CD ROM etc. The following data shows tools used by students.

Table 8: Tools – save information

| S.No | Tool used | No. of Respondents | Percentage(%) |
|---|---|---|---|
| 1 | CD ROM | 15 | 17.04 |
| 2 | Pen drive | 70 | 79.54 |
| 3 | Scanning | 30 | 34.09 |
| 4 | Print outs | 60 | 68.18 |
| 5 | Load on desk top | 68 | 77.27 |

The data in the (table 8) shows that 15 (17.04 %) save information in CDROM, 70(79.54 %) used Pen drive, 30 (34.09% ) scanning, 60 ( 68.18%) respondents have been printing the material, while 68(77.27 %) load on desk top. It indicates that majority using Pen drive to save digital information.

*Search terms used*

Users can search information by using different search terms such author, title, subject etc the following table shows the search terms used by students to get required information. The following table shows the search terms that are used by respondents for retrieving information.

Table 9: Search terms used

| S.No | Search term used | No. of Respondents | Percentage (%) |
|---|---|---|---|
| 1 | By term/keyword | 40 | 45.45% |
| 2 | By title | 62 | 70.45% |
| 3 | By subject | 69 | 78.40% |
| 4 | By author | 58 | 65.90% |

The data in the (table 9) shows that 40 (45.45%) used term or keyword, 62(70.45%) of respondents search by title, 69(78.40% ) search by subject and 58(65.90%) respondents have been using author as a key word to locate information. It Indicates majority used subject as search term.

*Use of Boolean Logic operators*

Users use Boolean logic operators such as AND OR NOT to get needed information .The following table shows the usage of Boolean logic operators by students

Table 10: Boolean logic- used

| S.No | Usage of AND OR NOT | No. of Respondents | Percentage (%) |
|---|---|---|---|
| 1 | Yes | 28 | 31.81 |
| 2 | No | 60 | 68.18 |

The data in the (table 10) shows that 28 (31.81 %) of respondents using the Boolean logic operators such as AND OR NOT and 60(68.18%) respondents does not use operators while searching information. It shows that majority are not using Boolean logic operators

*Evaluation of sources:*

Any information source can be evaluated by parameters such as authenticity and reliability etc the following table shows the students opinion about evaluation of information source

Table 11 : Evaluation- information

| S.No | Evaluation Parameters | No. of Respondents | Percentage (%) |
|---|---|---|---|
| 1 | Authenticity | 63 | 71.59 |
| 2 | Reliability | 52 | 59.09 |
| 3 | Usability | 43 | 48.86 |
| 4 | Coverage | 48 | 54.54 |
| 5 | accessibility | 40 | 45.45 |

The data in the (table .11) shows that 63 (71.59% ) respondents said authenticity of information is important and 52( 59.09%) respondents said reliability of the information is important in selecting the source, 43 (48.86% ) respondents said usability and 48 (54.54%) said coverage is important in evaluating the sources while 40(45.45% ) told accessibility is also a parameter to consider source. The data reflects that majority evaluated the source by authenticity and reliability.

*Need of Information Literacy programme*:

Now a day's Academic libraries provide Information literacy programs to students. The following table provides user opinion about need of the programmes

Table 12: need – Information literacy programmes

| S.No | Need of Information literacy programme | No. of Respondents | Percentage (%) |
|---|---|---|---|
| 1 | Yes | 75 | 85.22 |
| 2 | No | 13 | 14.77 |

The above data shows that 75(85.22%) of the respondents want information literacy programmes and 13(14.77%) are not interested in Information literacy programmes. This indicates that majority students need information literacy programmes to get quality information .

## 7. Major Findings of the study

**.**From the above data analysis majority 50% respondents using information for preparation of exams and 11.36% using information to improve their knowledge.
-Majority 45.45% users are spending 2-3 hours in the library
-Majority 62.4% users are aware about E journals and 55.68% are aware about E books
-Majority 62.5% users locating information by self and 46.49% users seeking help from friends and teachers
-100% users have internet browsing skill and 88.63% had downloading skill
-Majority 90.9% accessing digital information from Google search engine and websites 63.63%
-Majority 79.54% users save the retrieved information in pen drives and 68.18% are taking printouts.
-Majority 78.40% using subject as search term followed 70.45% by title
Majority 68.18% respondents are not using Boolean logic operators
Majority 71.59% respondents opined that authenticity of information and 59.09% said reliability of information is important to them.
-Majority 85.22% users want Information Literacy programs.

**Suggestions and Conclusion**:

The following suggestions were made based on findings:
The librarian has to conduct orientation programs to the students at the beginning of academic year and they should involve design and delivering of information literary programs. Training programs on search strategies like Boolean logic should be given. The librarian should conduct Information Literacy programs regularly atleast twice in an Academic Year. The Information literacy in universities and college libraries is in early stage. The Librarians of Colleges /Universities and professional bodies has to take responsibility to make students information literate.

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# Information Literacy Skills of Post Graduate Students of Sri G.V.G Visalakshi College For Women, (Autonomous), Udumalpet, Tamilnadu: A Discipline Based Comparative Study

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## ABSTRACT

*A Higher Education Institution necessitates its students to be information literate which is a primary and substantial character. Aiming to answer this, this comparative study was conducted at Sri G.V.G Visalakshi College for Women, Udumalpet, Tamil Nadu to investigate the information literacy skills of the postgraduate students of.arts and science streams. Census method and evaluative research design were employed. Data was collected through closed ended questionnaire via Google forms from all Post graduate students. 163 students responded. Analysis of collected data was done using SPSS V.23. The findings revealed that the more arts stream Post Graduate students strongly agree and more science stream postgraduate students agree that they possess almost all the seven Information Literacy skills ; There is wide variation in the skill level of arts and science students in the case of one particular skill namely organizing information professionally and ethically. More than four fifth of both arts and science stream students need training in different aspect of IL skills, to become knowledgeable.*

**Keywords:** *Information literacy, Postgraduate students, Information Literacy Skills, Arts Vs Science Streams*

## PREAMBLE

In this age of current information view point, students are regularly confounded on where to get required data for a specific task or examination. IL Skills has significantly reformed information management and organization of information positively. It is expected that PG women students would be familiar and comfortable with IL skills. For a Post graduate student, information literacy

provides a complete academic prospect, solely for aiming for education/research accomplishments, IL skill being an indicator of scholarly greatness and particularly makes a more cultured, insightful, and assertive women scientists. This study has been carried out to compare the information literacy skills among arts and science discipline Postgraduate students of Sri G.V.G.Visalakshi College for women, Udumalpet, Tamil Nadu. This study highlights and compare the IL skill levels of discipline specific students and helps the institution to concentrate in the development of IL competency of the students to get higher ranks in and grades in NIFR and Accreditations by improvising the contribution of the students in their research activities.

## ABOUT THE COLLEGE

Sri G.V.G. Visalakshi College for Women (Autonomous), affiliated to Bharathiar University was founded in 1952. The college gained its autonomy in the year 1995. The meticulous planning diligent effort to sustain quality and the impeccable execution has brought the crowning glory A+ grade in the fourth cycle of NAAC reaccreditation in 2019. The institution offers 8 Undergraduate programmes and 4 Postgraduates programmes in the Aided stream, 14 UG & 4 PG self —financing programmes and 6 research programmes.

## OBJECTIVES

The objectives of the present study are to examine and compare the information literacy skills of the post graduate women studentsto:

1. Identifythe need for information
2. Assesscurrent knowledge and identifying gaps
3. Constructstrategies for locating information and data
4. Locate and accessinformation and data needed
5. Review, compare and evaluate information and data
6. Organize information professionally and ethically and legally
7. Apply the knowledge gained

## RESEARCH METHODOLOGY

**Population and Sample Size:** All 212 postgraduate students pursuing their studies in the seven departments (Commerce, Computer Science, Economics, English, History, Physics, and Maths) of the college form the sample of the present study. Out of 212 Questionnaires forwarded, 170 respondents submitted their

Google forms. They were scrutinized for validity, finally 163 responses were selected for the final analysis.

## DATA ANALYSIS AND INTERPRETATION

### Stream-wise Distribution of the Respondents

The seven departments were categorized into two streams viz., Arts (Commerce, Economics, English and History) and Science (Computer Science, Physics and Maths) departments. In Arts stream, out of 110 students, 82 (74.54%) students responded and in Science stream out of 102 students, 81(79.41%) students responded.

**Table 1: Identification of need for information**

| IL Skill | Level of Agreement | Arts | | Science | |
|---|---|---|---|---|---|
| | | No. | % | No. | % |
| I can identify a lack of knowledge in my subject area | Strongly Agree | 29 | 33.0% | 8 | 10.7% |
| | Agree | 41 | 46.6% | 54 | 72.0% |
| | Neutral | 8 | 9.1% | 10 | 13.3% |
| | Disagree | 5 | 5.7% | 3 | 4.0% |
| | Strongly Disagree | 5 | 5.7% | 0 | 0.0% |
| I can identify a search topic or question and define it using simple terms | Strongly Agree | 41 | 46.6% | 16 | 21.3% |
| | Agree | 39 | 44.3% | 51 | 68.0% |
| | Neutral | 6 | 6.8% | 8 | 10.7% |
| | Disagree | 2 | 2.3% | 0 | 0.0% |
| | Strongly Disagree | 0 | 0.0% | 0 | 0.0% |
| I can identify the concepts and terms related to the information I need | Strongly Agree | 42 | 47.7% | 19 | 25.3% |
| | Agree | 41 | 46.6% | 48 | 64.0% |
| | Neutral | 4 | 4.5% | 7 | 9.3% |
| | Disagree | 1 | 1.1% | 1 | 1.3% |
| | Strongly Disagree | 0 | 0.0% | 0 | 0.0% |
| I can modify the need for information in the course of my search process | Strongly Agree | 40 | 45.5% | 10 | 13.3% |
| | Agree | 40 | 45.5% | 56 | 74.7% |
| | Neutral | 7 | 8.0% | 6 | 8.0% |
| | Disagree | 1 | 1.1% | 3 | 4.0% |
| | Strongly Disagree | 0 | 0.0% | 0 | 0.0% |
| I can use the | Strongly Agree | 32 | 36.4% | 10 | 13.3% |

| | | | | | |
|---|---|---|---|---|---|
| background information to underpin the | Agree | 47 | 53.4% | 52 | 69.3% |
| | Neutral | 8 | 9.1% | 12 | 16.0% |
| | Disagree | 1 | 1.1% | 1 | 1.3% |
| | Strongly Disagree | 0 | 0.0% | 0 | 0.0% |
| I can manage time effectively to complete a search | Strongly Agree | 42 | 47.7% | 21 | 28.0% |
| | Agree | 43 | 48.9% | 48 | 64.0% |
| | Neutral | 2 | 2.3% | 6 | 8.0% |
| | Disagree | 1 | 1.1% | 0 | 0.0% |
| | Strongly Disagree | 0 | 0.0% | 0 | 0.0% |
| I recognize that existing information can be combined with original concept to produce new information | Strongly Agree | 31 | 35.2% | 13 | 17.3% |
| | Agree | 51 | 58.0% | 52 | 69.3% |
| | Neutral | 5 | 5.7% | 8 | 10.7% |
| | Disagree | 1 | 1.1% | 2 | 2.7% |
| | Strongly Disagree | 0 | 0.0% | 0 | 0.0% |
| | Total | 88 | 100.0% | 75 | 100.0% |

It is clear from Table 1 that: More science students than arts students agree that they have all the skills to identify the need for information. But, more arts students than science students strongly agree that they have skills to identify the need for information.

**Table 2: Assessment of Current Knowledge and Identification of Gaps**

| IL Skill | Level of Agreement | Arts | | Science | |
|---|---|---|---|---|---|
| | | No. | % | No. | % |
| I know what I don't know to identify any information | Strongly Agree | 25 | 28.4% | 11 | 14.7% |
| | Agree | 48 | 54.5% | 41 | 54.7% |
| | Neutral | 12 | 13.6% | 18 | 24.0% |
| | Disagree | 3 | 3.4% | 5 | 6.7% |
| | Strongly Disagree | 0 | 0.0% | 0 | 0.0% |
| I can identify which types of information will best meet the need | Strongly Agree | 35 | 39.8% | 12 | 16.0% |
| | Agree | 46 | 52.3% | 55 | 73.3% |
| | Neutral | 6 | 6.8% | 8 | 10.7% |
| | Disagree | 1 | 1.1% | 0 | 0.0% |
| | Strongly Disagree | 0 | 0.0% | 0 | 0.0% |
| I can identify the available search tools | Strongly Agree | 34 | 38.6% | 16 | 21.3% |
| | Agree | 44 | 50.0% | 48 | 64.0% |

| | | | | | |
|---|---|---|---|---|---|
| | Neutral | 9 | 10.2% | 11 | 14.7% |
| | Disagree | 1 | 1.1% | 0 | 0.0% |
| | Strongly Disagree | 0 | 0.0% | 0 | 0.0% |
| I can identify general as well as subject specific resources at different levels | Strongly Agree | 33 | 37.5% | 13 | 17.3% |
| | Agree | 47 | 53.4% | 47 | 62.7% |
| | Neutral | 7 | 8.0% | 14 | 18.7% |
| | Disagree | 1 | 1.1% | 1 | 1.3% |
| | Strongly Disagree | 0 | 0.0% | 0 | 0.0% |
| I can identify different formats in which information may be provided | Strongly Agree | 33 | 37.5% | 12 | 16.0% |
| | Agree | 45 | 51.1% | 52 | 69.3% |
| | Neutral | 7 | 8.0% | 10 | 13.3% |
| | Disagree | 3 | 3.4% | 1 | 1.3% |
| | Strongly Disagree | 0 | 0.0% | 0 | 0.0% |
| I can demonstrate the ability to use new tools as they become available | Strongly Agree | 31 | 35.2% | 10 | 13.3% |
| | Agree | 48 | 54.5% | 56 | 74.7% |
| | Neutral | 8 | 9.1% | 9 | 12.0% |
| | Disagree | 1 | 1.1% | 0 | 0.0% |
| | Strongly Disagree | 0 | 0.0% | 0 | 0.0% |
| | Total | 88 | 100.0% | 75 | 100.0% |

It is clear from Table 2 that : More arts science than science strongly agrees and almost equal number of arts students and science students agree that they know what they don't know to identify any information. But, in the case of all other skills required to assess current knowledge and identify gaps, it is inferred that: More science students than arts students agree that they have all the skills to assess current knowledge and identify gaps. But, more arts students that science students strongly agree that they have skills to assess current knowledge and identify gaps. .

**Table 3: Construction of strategies for locating information and data**

| IL Skill | Level of Agreement | Arts | | Science | |
|---|---|---|---|---|---|
| | | No. | % | No. | % |
| I can define the scope of search question clearly and in appropriate language | Strongly Agree | 35 | 39.8% | 12 | 16.0% |
| | Agree | 48 | 54.5% | 53 | 70.7% |
| | Neutral | 5 | 5.7% | 9 | 12.0% |
| | Disagree | 0 | 0.0% | 1 | 1.3% |
| | Strongly | 0 | 0.0% | 0 | 0.0% |

| | | | | | |
|---|---|---|---|---|---|
| I can define a search strategy by using appropriate keywords and concepts, defining and setting limits | Strongly Agree | 27 | 30.7% | 11 | 14.7% |
| | Agree | 53 | 60.2% | 55 | 73.3% |
| | Neutral | 7 | 8.0% | 8 | 10.7% |
| | Disagree | 1 | 1.1% | 1 | 1.3% |
| | Strongly | 0 | 0.0% | 0 | 0.0% |
| I can select the most appropriate search tools | Strongly Agree | 34 | 38.6% | 12 | 16.0% |
| | Agree | 44 | 50.0% | 51 | 68.0% |
| | Neutral | 6 | 6.8% | 11 | 14.7% |
| | Disagree | 3 | 3.4% | 1 | 1.3% |
| | Strongly | 1 | 1.1% | 0 | 0.0% |
| I can identify controlled vocabularies to aid in searching, if appropriate | Strongly Agree | 30 | 34.1% | 13 | 17.3% |
| | Agree | 50 | 56.8% | 50 | 66.7% |
| | Neutral | 7 | 8.0% | 10 | 13.3% |
| | Disagree | 0 | 0.0% | 2 | 2.7% |
| | Strongly | 1 | 1.1% | 0 | 0.0% |
| I can identify appropriate search techniques to use, as necessary | Strongly Agree | 34 | 38.6% | 15 | 20.0% |
| | Agree | 48 | 54.5% | 52 | 69.3% |
| | Neutral | 5 | 5.7% | 7 | 9.3% |
| | Disagree | 0 | 0.0% | 1 | 1.3% |
| | Strongly | 1 | 1.1% | 0 | 0.0% |
| I can identify specialist search tools appropriate to each individual information need | Strongly Agree | 36 | 40.9% | 11 | 14.7% |
| | Agree | 40 | 45.5% | 50 | 66.7% |
| | Neutral | 10 | 11.4% | 10 | 13.3% |
| | Disagree | 1 | 1.1% | 4 | 5.3% |
| | Strongly | 1 | 1.1% | 0 | 0.0% |
| | Total | 88 | 100.0% | 75 | 100.0% |

It is clear from Table 3 that: More science students than arts students agree that they have all the skills to construct strategies required for locating information and data. But, more arts students than science students strongly agree that they have all the skills required to construct strategies for locating information and data.

## Table 4: Location and Accessing of information and data needed

| IL Skill | Level of Agreement | Arts | | Science | |
|---|---|---|---|---|---|
| | | No. | % | No. | % |
| I can use a range of retrieval tools and resources effectively | Strongly Agree | 38 | 43.2% | 5 | 6.7% |
| | Agree | 39 | 44.3% | 57 | 76.0% |
| | Neutral | 9 | 10.2% | 13 | 17.3% |
| | Disagree | 2 | 2.3% | 0 | 0.0% |
| | Strongly Disagree | 0 | 0.0% | 0 | 0.0% |
| I can construct complex searches appropriate to different digital resources | Strongly Agree | 33 | 37.5% | 7 | 9.3% |
| | Agree | 47 | 53.4% | 49 | 65.3% |
| | Neutral | 8 | 9.1% | 18 | 24.0% |
| | Disagree | 0 | 0.0% | 1 | 1.3% |
| | Strongly Disagree | 0 | 0.0% | 0 | 0.0% |
| I can construct complex searches appropriate to different print resources | Strongly Agree | 31 | 35.2% | 6 | 8.0% |
| | Agree | 46 | 52.3% | 55 | 73.3% |
| | Neutral | 11 | 12.5% | 12 | 16.0% |
| | Disagree | 0 | 0.0% | 2 | 2.7% |
| | Strongly Disagree | 0 | 0.0% | 0 | 0.0% |
| I can access full text information (both print and electronic) | Strongly Agree | 26 | 29.5% | 12 | 16.0% |
| | Agree | 46 | 52.3% | 48 | 64.0% |
| | Neutral | 15 | 17.0% | 15 | 20.0% |
| | Disagree | 1 | 1.1% | 0 | 0.0% |
| | Strongly Disagree | 0 | 0.0% | 0 | 0.0% |
| I can download online materials | Strongly Agree | 46 | 52.3% | 18 | 24.0% |
| | Agree | 32 | 36.4% | 49 | 65.3% |
| | Neutral | 7 | 8.0% | 7 | 9.3% |
| | Disagree | 3 | 3.4% | 1 | 1.3% |
| | Strongly Disagree | 0 | 0.0% | 0 | 0.0% |
| I can use appropriate techniques to collect new data | Strongly Agree | 39 | 44.3% | 18 | 24.0% |
| | Agree | 44 | 50.0% | 46 | 61.3% |
| | Neutral | 4 | 4.5% | 10 | 13.3% |
| | Disagree | 1 | 1.1% | 1 | 1.3% |
| | Strongly Disagree | 0 | 0.0% | 0 | 0.0% |
| I can keep up-to- | Strongly Agree | 37 | 42.0% | 18 | 24.0% |

| | | | | | |
|---|---|---|---|---|---|
| date with new information | Agree | 41 | 46.6% | 44 | 58.7% |
| | Neutral | 9 | 10.2% | 12 | 16.0% |
| | Disagree | 1 | 1.1% | 1 | 1.3% |
| | Strongly Disagree | 0 | 0.0% | 0 | 0.0% |
| I can identify when the information need has not been met | Strongly Agree | 36 | 40.9% | 12 | 16.0% |
| | Agree | 41 | 46.6% | 52 | 69.3% |
| | Neutral | 10 | 11.4% | 11 | 14.7% |
| | Disagree | 1 | 1.1% | 0 | 0.0% |
| | Strongly Disagree | 0 | 0.0% | 0 | 0.0% |
| I can use online and printed help | Strongly Agree | 37 | 42.0% | 17 | 22.7% |
| | Agree | 40 | 45.5% | 46 | 61.3% |
| | Neutral | 6 | 6.8% | 10 | 13.3% |
| | Disagree | 5 | 5.7% | 2 | 2.7% |
| | Strongly Disagree | 0 | 0.0% | 0 | 0.0% |
| I can find personal and expert help | Strongly Agree | 37 | 42.0% | 15 | 20.0% |
| | Agree | 41 | 46.6% | 49 | 65.3% |
| | Neutral | 8 | 9.1% | 9 | 12.0% |
| | Disagree | 2 | 2.3% | 2 | 2.7% |
| | Strongly Disagree | 0 | 0.0% | 0 | 0.0% |
| | Total | 88 | 100.0% | 75 | 100.0% |

It is clear from Table 4 that: More science students than arts students agree that they have all the skills required for locating information and data. But, more arts students than science students strongly agree that they have all the skills required for locating information and data.

**Table 5: Reviewing, Comparing and Evaluating information and data**

| IL Skill | Level of Agreement | Arts | | Science | |
|---|---|---|---|---|---|
| | | No. | % | No. | % |
| I can distinguish between different information resources and the information they provide | Strongly Agree | 39 | 44.3% | 10 | 13.3% |
| | Agree | 47 | 53.4% | 59 | 78.7% |
| | Neutral | 1 | 1.1% | 5 | 6.7% |
| | Disagree | 1 | 1.1% | 1 | 1.3% |
| | Strongly Disagree | 0 | 0.0% | 0 | 0.0% |
| I can choose suitable material on | Strongly Agree | 32 | 36.4% | 21 | 28.0% |
| | Agree | 50 | 56.8% | 49 | 65.3% |

| | | | | | |
|---|---|---|---|---|---|
| my search topic, using appropriate criteria | Neutral | 5 | 5.7% | 4 | 5.3% |
| | Disagree | 1 | 1.1% | 1 | 1.3% |
| | Strongly Disagree | 0 | 0.0% | 0 | 0.0% |
| I can assess the quality, accuracy, relevance, bias, reputation and credibility of the information | Strongly Agree | 32 | 36.4% | 11 | 14.7% |
| | Agree | 48 | 54.5% | 53 | 70.7% |
| | Neutral | 7 | 8.0% | 10 | 13.3% |
| | Disagree | 1 | 1.1% | 1 | 1.3% |
| | Strongly Disagree | 0 | 0.0% | 0 | 0.0% |
| I can assess the credibility of the data gathered | Strongly Agree | 37 | 42.0% | 12 | 16.0% |
| | Agree | 42 | 47.7% | 56 | 74.7% |
| | Neutral | 7 | 8.0% | 5 | 6.7% |
| | Disagree | 1 | 1.1% | 2 | 2.7% |
| | Strongly Disagree | 1 | 1.1% | 0 | 0.0% |
| I can read critically, identifying key points and arguments | Strongly Agree | 36 | 40.9% | 13 | 17.3% |
| | Agree | 45 | 51.1% | 53 | 70.7% |
| | Neutral | 6 | 6.8% | 8 | 10.7% |
| | Disagree | 1 | 1.1% | 1 | 1.3% |
| | Strongly Disagree | 0 | 0.0% | 0 | 0.0% |
| I can relate the information found to the original search strategy | Strongly Agree | 32 | 36.4% | 14 | 18.7% |
| | Agree | 49 | 55.7% | 54 | 72.0% |
| | Neutral | 7 | 8.0% | 6 | 8.0% |
| | Disagree | 0 | 0.0% | 1 | 1.3% |
| | Strongly Disagree | 0 | 0.0% | 0 | 0.0% |
| I can critically appraise and evaluate my own findings and those of others | Strongly Agree | 35 | 39.8% | 12 | 16.0% |
| | Agree | 46 | 52.3% | 51 | 68.0% |
| | Neutral | 4 | 4.5% | 10 | 13.3% |
| | Disagree | 3 | 3.4% | 2 | 2.7% |
| | Strongly Disagree | 0 | 0.0% | 0 | 0.0% |
| I know when to stop | Strongly Agree | 36 | 40.9% | 14 | 18.7% |
| | Agree | 43 | 48.9% | 52 | 69.3% |
| | Neutral | 6 | 6.8% | 9 | 12.0% |
| | Disagree | 2 | 2.3% | 0 | 0.0% |
| | Strongly Disagree | 1 | 1.1% | 0 | 0.0% |
| | Total | 88 | 100.0% | 75 | 100.0% |

It is clear from Table 5 that: More science students than arts students agree that they have all the skills required for Reviewing, Comparing and Evaluating information and data.. But, more arts students than science students strongly agree that they have all the skills required for Reviewing, Comparing and Evaluating information and data.

**Table 6: Organizing information professionally and ethically**

| IL Skill | Level of Agreement | Arts | | Science | |
|---|---|---|---|---|---|
| | | No. | % | No. | % |
| I can use bibliographic software ( Zotero, Mendeley etc.) if appropriate to manage information | Strongly Agree | 27 | 30.7% | 7 | 9.3% |
| | Agree | 47 | 53.4% | 39 | 52.0% |
| | Neutral | 12 | 13.6% | 23 | 30.7% |
| | Disagree | 2 | 2.3% | 5 | 6.7% |
| | Strongly Disagree | 0 | 0.0% | 1 | 1.3% |
| I can cite printed sources using suitable referencing styles like APA, MLA, Chicago, IEEE etc. | Strongly Agree | 26 | 29.54% | 08 | 10.7% |
| | Agree | 49 | 55.7% | 32 | 42.7% |
| | Neutral | 10 | 11.4% | 27 | 36.0% |
| | Disagree | 3 | 3.4% | 8 | 10.7% |
| | Strongly Disagree | 0 | 0.0% | 0 | 0.0% |
| I can cite electronic sources using suitable referencing styles like APA, MLA, Chicago, IEEE etc. | Strongly Agree | 24 | 27.3% | 5 | 6.7% |
| | Agree | 50 | 56.8% | 37 | 49.3% |
| | Neutral | 10 | 11.4% | 25 | 33.3% |
| | Disagree | 4 | 4.5% | 6 | 8.0% |
| | Strongly Disagree | 0 | 0.0% | 2 | 2.7% |
| I can create appropriately formatted bibliographies / list of references | Strongly Agree | 28 | 31.8% | 8 | 10.7% |
| | Agree | 49 | 55.7% | 41 | 54.7% |
| | Neutral | 8 | 9.1% | 19 | 25.3% |
| | Disagree | 3 | 3.4% | 6 | 8.0% |
| | Strongly Disagree | 0 | 0.0% | 1 | 1.3% |
| I can demonstrate awareness of issues relating to the rights of others including ethics, data protection, | Strongly Agree | 29 | 33.0% | 9 | 12.0% |
| | Agree | 50 | 56.8% | 45 | 60.0% |
| | Neutral | 9 | 10.2% | 14 | 18.7% |
| | Disagree | 0 | 0.0% | 5 | 6.7% |
| | Strongly Disagree | 0 | 0.0% | 2 | 2.7% |
| I know what is | Strongly Agree | 30 | 34.1% | 6 | 8.0% |

| | | | | | |
|---|---|---|---|---|---|
| plagiarism and its implications | Agree | 42 | 47.7% | 39 | 52.0% |
| | Neutral | 16 | 18.2% | 23 | 30.7% |
| | Disagree | 0 | 0.0% | 5 | 6.7% |
| | Strongly Disagree | 0 | 0.0% | 2 | 2.7% |
| I meet standards of conduct for academic integrity | Strongly Agree | 31 | 35.2% | 6 | 8.0% |
| | Agree | 43 | 48.9% | 52 | 69.3% |
| | Neutral | 13 | 14.8% | 11 | 14.7% |
| | Disagree | 1 | 1.1% | 3 | 4.0% |
| | Strongly Disagree | 0 | 0.0% | 3 | 4.0% |
| I can use appropriate data management software and techniques to manage data (like SPSS, Excel, PSPP, SOFA, R etc.) | Strongly Agree | 30 | 34.1% | 12 | 16.0% |
| | Agree | 46 | 52.3% | 39 | 52.0% |
| | Neutral | 9 | 10.2% | 20 | 26.7% |
| | Disagree | 3 | 3.4% | 2 | 2.7% |
| | Strongly Disagree | 0 | 0.0% | 2 | 2.7% |
| | Total | 88 | 100.0% | 75 | 100.0% |

It is clear from Table 6 that: More arts students than science students strongly agree and more science students than arts students agree that that they have required skills related to the rights of others, plagiarism and academic integrity. More arts students than science students strongly agree and almost equal percent of both arts and science stream students agree that they have required skills about use of bibliographical softwares, creation of list of references and data management softwares and techniques. But more arts students than science students strongly agree and agree that they can cite printed resources and electronic resources using suitable referencing styles.

**Table 7: Application of knowledge gained**

| IL Skill | Level of Agreement | Arts | | Science | |
|---|---|---|---|---|---|
| | | No. | % | No. | % |
| I can use the information and data found to address the original question | Strongly Agree | 34 | 38.6% | 12 | 16.0% |
| | Agree | 50 | 56.8% | 55 | 73.3% |
| | Neutral | 4 | 4.5% | 7 | 9.3% |
| | Disagree | 0 | 0.0% | 0 | 0.0% |
| | Strongly | 0 | 0.0% | 1 | 1.3% |
| I can summarize documents and | Strongly Agree | 31 | 35.2% | 14 | 18.7% |
| | Agree | 51 | 58.0% | 54 | 72.0% |

| | | | | | |
|---|---|---|---|---|---|
| reports verbally and in writing | Neutral | 6 | 6.8% | 5 | 6.7% |
| | Disagree | 0 | 0.0% | 1 | 1.3% |
| | Strongly | 0 | 0.0% | 1 | 1.3% |
| I can incorporate new information into the context of existing knowledge | Strongly Agree | 31 | 35.2% | 13 | 17.3% |
| | Agree | 50 | 56.8% | 47 | 62.7% |
| | Neutral | 6 | 6.8% | 14 | 18.7% |
| | Disagree | 1 | 1.1% | 0 | 0.0% |
| | Strongly | 0 | 0.0% | 1 | 1.3% |
| I can analyze and present data appropriately | Strongly Agree | 34 | 38.6% | 12 | 16.0% |
| | Agree | 48 | 54.5% | 51 | 68.0% |
| | Neutral | 5 | 5.7% | 9 | 12.0% |
| | Disagree | 1 | 1.1% | 2 | 2.7% |
| | Strongly | 0 | 0.0% | 1 | 1.3% |
| I can synthesis and appraise new and complex information from different sources | Strongly Agree | 29 | 33.0% | 12 | 16.0% |
| | Agree | 55 | 62.5% | 52 | 69.3% |
| | Neutral | 4 | 4.5% | 9 | 12.0% |
| | Disagree | 0 | 0.0% | 2 | 2.7% |
| | Strongly | 0 | 0.0% | 0 | 0.0% |
| I can communicate effectively using appropriate writing styles in a variety of formats | Strongly Agree | 32 | 36.4% | 13 | 17.3% |
| | Agree | 50 | 56.8% | 49 | 65.3% |
| | Neutral | 6 | 6.8% | 11 | 14.7% |
| | Disagree | 0 | 0.0% | 2 | 2.7% |
| | Strongly | 0 | 0.0% | 0 | 0.0% |
| I can communicate effectively verbally | Strongly Agree | 31 | 35.2% | 14 | 18.7% |
| | Agree | 51 | 58.0% | 51 | 68.0% |
| | Neutral | 5 | 5.7% | 8 | 10.7% |
| | Disagree | 1 | 1.1% | 2 | 2.7% |
| | Strongly | 0 | 0.0% | 0 | 0.0% |
| I can select appropriate publications and dissemination outlets in which to publish | Strongly Agree | 29 | 33.0% | 10 | 13.3% |
| | Agree | 54 | 61.4% | 50 | 66.7% |
| | Neutral | 3 | 3.4% | 12 | 16.0% |
| | Disagree | 2 | 2.3% | 2 | 2.7% |
| | Strongly | 0 | 0.0% | 1 | 1.3% |
| | Total | 88 | 100.0% | 75 | 100.0% |

It is clear from Table7 that: More arts students than science students strongly agree that they have maximum skills required for applying the knowledge gained, But, more science students than arts students agree that they have all skills required for applying the knowledge gained.

**Table 8: Need for Information Literacy Programme (ILP)**

| Variable | Response | Arts | | Science | |
|---|---|---|---|---|---|
| | | No. | % | No. | % |
| Need for IL Programme | No | 15 | 17.0% | 11 | 14.7% |
| | Yes | 73 | 83.0% | 64 | 85.3% |
| | Total | 88 | 100.0% | 75 | 100.0% |
| IL as an elective paper | Strongly Agree | 34 | 38.6% | 6 | 8.0% |
| | Agree | 52 | 59.1% | 66 | 88.0% |
| | Neutral | 0 | 0.0% | 0 | 0.0% |
| | Disagree | 2 | 2.3% | 2 | 2.7% |
| | Strongly Disagree | 0 | 0.0% | 1 | 1.3% |
| | Total | 88 | 100.0% | 75 | 100.0% |

It is good to note from Table 8 that more than 80% of both science stream students (85.3%) and arts stream students (83%) need Information Literacy programmes. More than one third of arts students and less than $1/10^{th}$ of science students strongly agree while 50% of arts students and 88% of science students agree that they need to have IL as an elective paper in their course curriculum.

## Suggestions

- Conducting seminars, workshops, conferences related to search strategies,
- Giving assignments / preparation of reports for a given topic.
- Continuous assessment which carries weightage in grade or marks.
- Incorporating Information Literacy as an elective /core subject.
- Certificate / Diploma course in Information Literacy

## Conclusion

This paper has taken a phenomenographic approach to explore disciplinary differences between traditional categories established by Becher (1989). This paper

has revealed that a good number of both the arts and science stream post graduate students possess the required information literacy skills. The difference is found to be only at very few sub-skills. The skill 'Organizing information professionally and ethically' has vide disparity in the skill levels of arts and science students than all other skills. Information literacy is one of the main factors that prompt the educational success. As there exists an optimistic relationship between academic performance and information literacy skills, we should necessarily furnish the students with relative skills to progress their scholastic and research performance, as revealed from the necessity of both stream students.

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# Need of Information Literacy For library Users

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## Abstract:

*Information Literacy is the need of 21st century for the library users and the library professional to find out, search, evaluate, and proper use of the information whether it is printed of electronic resources. This paper discussed the concept of information literacy, need of information literacy, definition of information literacy, and the models for the information literacy for the users. This paper creates awareness in the library professionals for the need of the information literacy for the users.*

**Keyword:** *Information Literacy, Need of Information Literacy, Skill of Information Literacy, Models of Information Literacy*

## Introduction:

Information and Communication Technology (ICT) has made revolutionary changes in the present era. Library is one of the prominent parts of the institution and society, which disseminate the knowledge and information to the society and user community. ICT has created the new types of information sources i.e. electronic sources, digital sources etc. with the traditional printed sources i.e. books, journals etc. The value of ICT-based resources and services are that it can be easily share, distribute, update, manipulate, and rapidly searche (Muruli).

Library is responsible to provide information and resources to the users effectively. According to age and application of Information and Communication Technological tools to library, library services and its functions are transforme from traditional to modern. In this age library professional, have to fulfil the different types of users who demanded various types of information. Hence, it becomes necessary to library professional to recognize, locate, evaluate, and manage the demanded information efficiently to satisfy the demand of the users.

Information Literacy creates awareness among the users and the library professionals. Information literacy will help users and library professionals to

develop new skills that help them to aware about the newly created information available in various forms. It will them to manage the electronic resources, search and utilizes these resources and effectively.

## Definitions of Information Literacy (IL):

American Library Association has defined the Information Literacy as the ability to recognize when information is needed and have the ability to locate, evaluate, and use effectively the needed information (Shweta Kumari K, Dr. T. Y. Mallaiah, 2017). According to National Forum on Information Literacy, "The ability to know when there is a need for information, to be able to identify, locate, evaluate, and effectively use that information for the issue or problem at hand (Anjaiah, 2016). Information Literacy is the ability to identify what information is needed, understand how the information is organized, identify the best sources of information for a given need, locate those sources, evaluate the sources critically, and share that information (Thanuskodi, 2019). From the above definitions we came to know that information literacy is create awareness in the users about the information and how to locate, evaluate and identify the appropriate information and how to use this information for their study purpose effectively.

## Need of Information Literacy:

The present century is the century of Information where information explosion took place with the help of newly invented and accepted by the age i.e. Information and Communication Technology (ICT). Educational sector is also affected by the information and communication technology a lot. Library, which is one of the prominent parts of the educational institution have been affected by the information technology. Adoption of the ICT tools in the library has created challenges. With the changing circumstances and demand of the users library had to transforms itself from its traditional way of functioning with electronic information services. Electronic information services have created new types of information i.e. electronic information, digital information available in various formats.

Most of the users don't have knowledge about these newly created resources. They are not aware about how to access, manage, locate and use of these resources appropriately. They are not also aware about the digital tools and facilities. It creates confusion in the users that which information is useful for their purpose. Information literacy creates awareness in the users about their facing problems. Literacy includes the ability to read and interpret media, to reproduce data and images through digital manipulation, and to evaluate and apply new knowledge gained from digital environments (Anjaiah, 2016).

## What is Information Literacy?

Collection in the library whether it is print material (books) or electronic material (e-resources) known as information. Libraries in the modern age have these types of resources. All these materials are select, acquire, and organize users to retrieve easily. 21st Libraries have huge collection of electronic resources known as digital resources with the print materials. Digital resources i.e. e-books, e-journals and other types of materials can be accessed only through a digital devices like computers, mobiles etc. (Clement C. Okeji, Ndidi Grace Nwankwo, Ifeanyi Adindu Anene, 2020). Charted Institute of Library and Information Professionals, UK defines information literacy as "knowing when and why you need information, where to find it, and how to evaluate, use and communicate in ethical manner" (Swapna G., Dr. B. S. Biradar, 2017).

The term information literacy was first used by Paul Zurkowski1 the President of Information Industry Association in 1974. He used the term in a proposal submitted to the US National Commission on Libraries and Information Science (NCLIS). According to him, information literate peoples are those who trained in the application of information resource in their work. They have learned techniques and skills for utilizing the wide range of information tools as well as primary sources in moulding information solutions to their problems (Swapna G., Dr. B. S. Biradar, 2017).

According to results of study conducted by Doyle, an information literate person is one who:

- recognizes the need for information;
- appreciates the importance of accurate and complete information to make intelligent decisions;
- formulates questions based on information needs;
- identifies potential sources of information;
- develops appropriate search strategies;
- accesses sources of information including computer-based and other technologies;
- evaluates information;
- organizes information for practical application;
- integrates new information into an existing body of knowledge and
- uses information in critical thinking and problem solving. (Doyle, 1992)

## Aims of Information Literacy:

Aims of Information Literacy is to teach the users about the information, how to find their appropriate information and use it for lifelong learning.

1. Create awareness in the users how to find out the information from various sources and evaluate them to fulfil their needs.
2. To become the users self-learner for lifelong learners
3. Create the awareness among the users why they need to learn about different sources of information.
4. Make the users able uses of proper information retrieval tools to get the proper information related to their study purpose and for other study. (Dr. S Kishore Kumar, B. Surendran, 2015)

## Skills of Information Literacy:

Society of College, National and University Libraries (SCONUL), UK defined some of the major information skills required for the users, students are:

1. The ability to recognize a need for information
2. The ability to distinguish ways in which the information gap may be addressed
3. Ability to construct strategies for locating information
4. Ability to locate at accessing information
5. Ability to compare and evaluate information
6. Ability to organize, apply and communicate information to others in ways appropriate to the situation
7. Ability to synthesize and build upon existing information
8. Contribute to the creation of new knowledge. (ILA 2005)
9. A course in information literacy integrated in to the core curriculum is the apt way to provide information literacy skills to the students from school levels. (Dr. S Kishore Kumar, B. Surendran, 2015)

## Models for Information Literacy:

There are various models are available for the Information Literacy

1. **Christine Bruce has develop a model Seven Faces of Information Literacy in Higher Education**

   - **Category one: information technology appreciation.**

     Information literacy is seen as using information technology for information retrieval and communication.

   - **Category two: information sources appreciation.**

     Information literacy is seen as finding information located in information sources.

   - **Category three: information process appreciation.**

     Information literacy is seen as executing a process.

   - **Category four: information control appreciation.**

     Information literacy is seen as controlling information.

   - **Category five: knowledge construction appreciation.**

     Information literacy is seen as building up a personal knowledge base in a new area of interest.

   - **Category six: knowledge extension appreciation.**

     Information literacy is seen as working with knowledge and personal perspectives adopted in such a way that novel insights are gained.

   - **Category seven: wisdom appreciation.**

     Information literacy is seen as using information wisely for the benefit of others (Ane Landoy, Daniela Popa, Angela Repanovici, 2020).

2. **CILIP Information Literacy Model**

CILIP have developed an information literacy model that contains eight competencies or understandings that a person requires to be information literate:

- A need for information;
- The resources available;
- How to find information;
- Need to evaluate results;

- How to work with or exploit results;
- Ethics and responsibility of use;
- How to communicate or share findings; and
- How to manage findings (Ane Landoy, Daniela Popa, Angela Repanovici, 2020)

## Conclusion:

Information literacy is became the need of 21st century which has created the various resources of information i.e. print materials, electronic materials, audio-visual material. In these circumstances users do not have the knowledge about how the information search and how to use these information for their study purpose. Information literacy creates awareness in the users how to find out their proper information and how to use it for their different types of purposes for lifelong learning. Library professional can create awareness in the users using various models of information literacy and make their users competent.

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# Best Practices for Creating Awareness on E-Resources in Agricultural Libraries: Initiatives at ANGRAU University Library

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## Abstract

*The information and communication technology has brought tremendous changes in the Library and Information Services. The advancement of ICTs, libraries turn into multidimensional information center and provide seamless access to internet based services. Online resources have emerged as worldwide information highways and are being added to library. These resources are playing vital for fast searching and anywhere, anytime availability even at remote place. The main goal of any library is to inform about newly subscribed resources or services to the users for effective use of the same. This paper confers on various e-resources available in ANGRA University library and initiatives adopted for their promoting e-resources and optimum use.*

**Keywords**: *e-Resources, User Orientation, Remote access, e-Databases, ANGRAU.*

## Introduction

The main objective of the library is to achieve the information requirements of the users with the arrangement of all types of resources; this may be traditional as well as in e-content form. The Information Technology has changed the concept of libraries. Libraries are Depository of cultural and civilization past and sustained of intellectual activity that anticipates the future and latest forms of library services, the newest form of educational media and most advanced means of storing and retrieving information. Library has been Chief conserve of Knowledge and Ideas of Man. It is a vital link in the chain of the man's communication. But, above all Library is a Human Enterprise. The father of library science in India Dr. S.R. Ranganthan was propounded the five laws of library science in India. These five laws look very trivial, but embody deep thought. These laws give philosophical base, guarantying an everlasting future to the subject of Library and Information Science, library profession and library users.

The right information to the right reader at right time is the key to satisfy user. Information is now seen as a product which should be supplied to the desired user with modification. Libraries like a marketing organization can use their tools to attract the users to utilize their products and services. Libraries of today's have modernized structures be it documents, services etc. Changes in computer and communication technologies have radically transformed the library and information environment. These technologies have further made the job of library and information professional more challenging.

## Libraries and its Services

Institutions of higher education have the main responsibilities of equipping students, researchers and faculty with advanced knowledge and skills. A well-equipped and managed library is an essential prerequisite to achieve this. In particular, scientific research needs a library as well as its laboratories. Keeping this in view, the Library undertakes many responsibilities and performs varied functions and it plays a vital role in the university education and research by providing invaluable resource of knowledge.

The Library supports the students and faculty to enhance their academic requirements to develop their research capabilities:

- To assess library collections and electronic resources to support their research.
- Help identify and order materials to support student research for their class.
- Provide customized instruction sessions on library resources and research methods.
- Help to structure research assignments for the Block Plan.
- Give you an individual tour and orientation to the library.
- Help you stay current content in their field through journal contents alert services.

## Library Services

Library Services: Following services are offered by the ANGRAU Library:

- Circulation Desk
- Weekly display of new arrivals.
- Inter Library Loan and Inter Library Reference Services.

- Reprographic services.
- Display of the list of reserved books received in the library.
- Library orientation to fresh members.
- Supply of hand-out to guide the users for the use of library.
- Display of Indian and Foreign periodical Publications.
- Individual attention and help to the users to locate their required reading material.
- Display of prospectus for various courses of national and international universities.
- Files for newspaper cuttings on College and University
- Current awareness service to faculty members through email (DDR)

## Role of Librarian in Networked Environment

E-resources and services refer to a variety of electronic and digital sources of information that are available these days. The change in traditional document delivery services from print to electronic has come about very quickly and library and information services have undergone significant transformation in order to effectively deliver electronic resources to the academic community. E-resources become widely more popular among library users because e-resources have many advantages over print resources like cheaper, easily accessible, fast speed of delivery, multiple accesses, much probability of availability, archiving and multimedia capabilities etc.

## User Orientation and Awareness Programmes:

The major obstacle in effective use of library e-resources is lack of awareness. The concept awareness programmes is that stakeholders' essential to aware about the various resources available in the library. User orientation on library services and resources is done through different programmes:

**PGS-501 Library Services Course**: Conducts Non-Credit compulsory course on Library and Information Services (PGS-501)for the M.Sc. and Ph.D. Students. The main objective of the course is to educate the users on library resources, its access, formats of information resources, online resources, hands on training on e-resources and collection of literature etc.

**Orientation Programme:** The Orientation Programmes on the library system, rules and regulations, library facilities and services of library, etc., are being conducted every year to newly admitted U.G., M.Sc., and Ph.D students.

**Awareness Programmes on e-Resources**: The University Library is regularly conducting training cum and awareness programmes on e-Resources and on accessing online information resources viz., CeRA, KrishiKosh, Statistical Databases, e-Books, e-Journals, etc. for the benefit of Scientists, Teachers, Extension Specialists and Students.

**University Library web link:** Created web-page where navigation to help tools is easy and direct. The web-page of the ANGRAU library is well designed and easy to understand. Links to the various resources are provided under the relevant headings. Information related to various library resources is updated regularly.

**E-Announcements:** alerts in the form of e-mails, whatsapp groups, DDR requests, notification of new journals, is the integral part of library promotion. New added e-resources are sent through emails to the stakeholders to keep them aware of e-contents and facilities.

**Hands on Training Programmes:** training programmes are being organized regularly on online resources for users at digital library about its availability as well as accessibility. All students are educated as how to create alert for journals of their interest through CeRA.

**Presentation of e-content providers**: Demonstrations of online resources like e-databases, e-books, e-learning and e- journals from the various renowned publishers like CABI, Wiley, ASAP, Astral, Taylor and Francis etc. are beneficial for teachers and students for awareness and use.

**Display chats and pamphlets**: Regularly displaying latest chats and instruction on how to retrieve relevant information from online resources. It helps the user to know about existing resources for their better and effective utilization.

**User Manuals**: Maintaining different manuals on online resources for specific user instruction guides have been prepared to use the available resources for maximum utilization.

**Ask Librarian**: Provided phone numbers and an email link on library' web page to receive e-mail questions is also option available.

## E-Resources and Services at ANGRAU

The Library has created a database of Books, Journals, Thesis, Reports and Reference sources and it's made available through 'OPAC'. The library has also created databases of current periodicals, on-line Journals subscribed and digitized database of Theses available in the Library. It also has contributed to the project Strengthening of Digital Library and Information Management under NARS (e-Granth) by setting up a work station for digitization of old resources prior to 1960, which is housed in the library building. Recently library has implemented KOHA Library Management System. The library has implemented and will adopting new technologies to keep pace with the growing information needs of the community to provide better information services.

The ANGRAU Library has subscribed e-Resources/Online Resources to provide the latest information to the Teachers, Scientists, Extension Specialists, Students etc. to meet their research and educational information needs.

**Statistical Database**: Indiastat.com and EPWRF are authentic storehouse for socio-economic statistics about India. It provides statistical data, current happenings with a statistical approach, and articles from scholars on subjects of social and economic importance etc.

**e-Books:** The ANGRAU University Library has purchased from different reputed publishers from International and National, more than 900 e-Books on Agriculture and allied sciences which can be accessed through I.P. and User ID and Password basis. The e-Books are very much useful to the Teachers, Scientists, Extension Specialists and Students to browse the important content on agricultural and allied sciences.

**e-Journals**: The ANGRAU University Library has subscribed from International and National e-Journals, more than 200 on Agriculture and allied sciences which can be accessed through I.P. and User ID and Password basis.

**J-Gate Agriculture and Biological Sciences**: It has also provides access to Online e-Journals Portal called J-Gate Agriculture and Biological Sciences under CeRA.

**Consortium for e-Resources in Agriculture (CeRA):** In addition to that CeRA (Consortium for e-Resources in Agriculture) under NAIP project from 2008 onwards. It is providing access to nearly 2900 journals in agriculture and allied disciplines. The user ID and Passwords have been circulated to all the Colleges of the University, Research Stations and also to all the patrons of the University to utilize the e-Resources effectively.

**KrishiKosh:** KrishiKosh is an Institutional Repository under National Agricultural Research System (NARS). The repository of knowledge in agriculture and allied sciences, having collection of old and valuable books, records and various documents spread all over the country in different libraries of Research Institutions and State Agricultural Universities (SAUs).

**Open Access Database**: University Library has created a database of open access e-Books, e-Journals, e- Reports and Reference sources and it's made available through 'OPAC'.

**DELNET**: The University is the member in DELNET and access the all resource to our clientele.

**Plagiarism Software**: University Library monitoring and administer the anti-plagiarism software like Drillbit, Urkund for research output.

**Remote Login Service**: The ANGRAU University Library through its campus network and Remote Login facility facilitates to provide access to huge data base collection of subscribed online resources. The users can access e-Resources and large collection of print resources, while Web-OPAC will facilitate the users to search and explore the availability of holdings of Library from any place of their convenience 24x7.

**Other e-Content and useful links**: Nearly 42 e-journals of ICAR open access journals are compiled and made available to all users for their academic pursuits and also provided list of some agricultural websites which provides latest information.

**Library Automation**: Circulation activities of the library had been automated using " KOHA Integrated Library Management System" developed for all libraries. Necessary equipment for automation of the library viz., computers, printer, scanner, barcode label printer and barcode readers etc., had been procured under ICAR funds.

## Conclusion:

The role of the librarians has to be fully changed to discharge the information dissemination. The librarians are now called as information scientist to manage the avail information and provide the right information to the right users. E-resources provide exceptional opportunities to expand the scope of information available to patrons. We provide access to e-Resources to users when and where they need it, extend our services beyond the library hours, save the Library users travel time, and provide new services to users who may need access from across the globe. The publicity and awareness programmes of user to effectively access to their required right e-resources are very crucial and requirements substantial responsiveness. The object of promoting e-resources is to provide maximum awareness among the specific user community and the compulsory training programmes to enable retrieval of ones' required information. It can be measured as one of the major factors for success of any library services. The user education programme should be compulsory in the part curriculum and the librarian in association with teaching faculty through their supportive preparation, teaching partnership can efficiently identify and facilitate student's requirements. Therefore, the library should have complete promotional strategies to make users educated about different e-resources and actual user education to facilitate the access.

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# Book Transactions by Physics PG Students of IGM Library, University of Hyderabad

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## Abstract

*Libraries procure documents for readers. The documents should be put to maximum use. The first two laws of library science advocate that the readers should get books to meet their information needs; and every book in the library should be used by the readers. The circulation section of any library helps in following these laws by circulating books among the readers. This study assessed the book transactions by Physics PG students of Indira Gandhi Memorial Library, University of Hyderabad, Hyderabad with a view to providing valuable data to help students to get a better orientation on the use and importance of book transactions for their academic work, to guide instructors and teachers on the use of library, information retrieval processes and information literacy, and to help University management, policy-makers and other stakeholders to make appropriate policies concerning the acquisitions of library materials. The present study limits itself to an analysis of data related to book transactions of 96Physics PG students and their 1700 book transactions were analysed in this study. In fact, data pertaining to the use of textbooks and reference books consulted in other areas of the library is excluded from the scope of the present study.*

**Keywords:** *Use of books, borrowing of books, borrowers, circulation section, analysis of circulation books, library users*

## *Introduction*

Typically, an academic library primarily seeks to plan, collect, organize, process and disseminate information to varied user groups. In the Indian context, the status of an academic library is determined by the effectiveness with which various resources are shared among different user groups. The libraries continue to be guided

by the cherished objective of seamless dissemination of information and knowledge. However, over the years, users' preference for circulation of books beyond the confines of the library to their own home has in a sense highlighted the capacity of the library personnel to make optimum utilization of library resources. The user enquiries for information mostly pertain to meeting the needs of research, publication and instructional purposes which are largely met through circulation of books. Upon the strength of its data circulation a library is rated, either as strong or weak in fulfilling the information need of its user community.

## Need and Purpose of the Study

The basic function of any library is the circulation of books. Especially in developing countries like India lending of documents serves as a medium for dissemination of information. However, it has been agreed that the circulations of documents for home reading maximize the use of the resources of a library. Circulation of books helps to meet the informational inquiries of the users of the library in their research, publication and instructional activities. The strength and weakness of any library can be judged by its circulation data. In essence, analysis of circulation records reflects the quality of hook choices made by the borrowing users, along with the number and frequency of books. Hence the present work has been taken up to know in depth all aspects relating to book transactions done by 96 MCA students and their 1700 book transactions of the Indira Gandhi Memorial (IGM) Library, University of Hyderabad, Hyderabad, Telangana based on the circulation records maintained by it. The main purpose of the present study is to improve the use of books among student community.

## Objectives

The following are the objectives of the present study:

1. To find out the number of book transactions done by Physics Postgraduate students during their year of study in Indira Gandhi Memorial Library, University of Hyderabad, Hyderabad;
2. To know the community and gender wise book transactions by postgraduate students;
3. To know the region wise book transactions by postgraduate students;
4. To know the authorship pattern of book transactions done by postgraduate students;
5. To know the type of authors of book transactions;

6. To know the chronological distribution of book transactions by postgraduate students;
7. To know the geographical distribution of book transactions;
8. To prepare the rank list of publishers based on the most frequently used published by them;
9. To know the subject wise book transactions; and
10. To prepare the rank list of most frequently used books
11. To examine the application of Bradford's Law to the data pertaining to books borrowed by Physics postgraduate students.

**Methodology used in the study**

The target population is the book borrowers of Physics Postgraduate students in School of Sciences of the IGM Library, UOH. The present study limits itself to an analysis of data related to book transactions of all 96Physics PG students and their 1700 book transactions. The data were analyzed using simple descriptive statistics and frequencies and percentages.

**Analysis and Interpretation of the Data**

The distribution of book transactions by Physics PG students of the Indira Gandhi Memorial Library, University of Hyderabad is presented in the following tables;

**Table 1: Library book transactions by PG Physics students according to their year of study**

| Sl. No. | Year | Students | | Book Transactions | | Average |
|---|---|---|---|---|---|---|
| | | No | % | No | % | |
| 1 | I Year | 49 | 51.04 | 810 | 47.65 | 17 |
| 2 | II Year | 47 | 48.96 | 890 | 52.35 | 19 |
| | **Total** | 96 | 100.00 | 1700 | 100.00 | 18 |

The study intends to examine the library book transactions by PG Physics students with respect to their year of study. It is evident from Table 1 that majority (52.35%) of the physics book transactions are done by the II year students with on average of 19 books during the period of their study and remaining 47.65 percent of the book transactions are done by I year students with on average of 17 books during the period of their study.

**Table 2: Library book transactions by PG Physics students according to their community and gender**

| Sl. No | Community | Gender | Students | | | | Total | Book Transactions | | | | Total | Average |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | No | % | C.No | % | | No | % | C.No | % | | |
| 1 | SC | Male | 10 | 10.41 | 10 | 10.41 | 15 | 156 | 9.18 | 156 | 9.18 | 251 | 16 |
| | | Female | 5 | 5.21 | 15 | 15.63 | (15.63) | 95 | 5.59 | 251 | 14.77 | (14.77) | 19 |
| 2 | ST | Male | 5 | 5.21 | 20 | 20.84 | 7 | 78 | 4.59 | 329 | 19.36 | 98 | 15 |
| | | Female | 2 | 2.08 | 22 | 22.92 | (7.29) | 20 | 1.18 | 349 | 20.54 | (5.76) | 10 |
| 3 | OBC | Male | 18 | 18.75 | 40 | 41.67 | 28 | 254 | 14.94 | 603 | 35.48 | 490 | 14 |
| | | Female | 10 | 10.41 | 50 | 52.08 | (29.16) | 236 | 13.88 | 839 | 49.36 | (28.82) | 24 |
| 4 | Other Categories (EBC,PwD, NRIetc.) | Male | 28 | 29.17 | 78 | 81.25 | 46 | 445 | 26.18 | 1284 | 75.54 | 861 | 16 |
| | | Female | 18 | 18.75 | 96 | 100.00 | (47.92) | 416 | 24.46 | 1700 | 100.00 | (50.65) | 23 |

C.No- Cumulative Number

The study intends to examine the library book transactions by PG Physics students with respect to their community and gender. It is obvious from Table 2 that out of 96 PG physics students most (46) of the Other Category students (EBC, PwD, NRI etc,.) borrowed more books (50.65%) with an average of 39 books, followed by OBC students (28) borrowed 28.82 percent of books with an average of38 books, Scheduled Caste (SC) students (15) borrowed 14.77 percent of the books with an average of 35 books and remaining Scheduled Tribe (ST) students (7) borrowed 5.76 percent of the books with an average 25 books.

It is also indicated in the table that out of 96 PG Physics students, most (28) of the male students and female (18) students belong to Other Categories (EBC, PwD, NRI etc.,). In this category, out of 861 borrowed books, male students

borrowed 445 books with 26.18 percent and remaining 416 books are borrowed by female students with 24.46 percent, whereas in OBC community 18 students are male and 10 students are female category with 254 (14.94%) and 236 (13.88%) book transactions. In SC community, 10 students are male and 5 students are female with 156 (9.18%) and 95 (5.59%) book transactions where as in ST community 5 students are male and 2 students are female with 78(4.59) and 20(1.18) book transactions respectively. It can be concluded that Other Category students (EBC, PwD, NRI etc.,) borrowed more number of books when compared to SC, ST and OBC students.

**Table 3: Library book transactions by PG Physics students according to their Region**

| Sl. No | Region | Students | | Book Transactions | | Average |
|---|---|---|---|---|---|---|
| | | No | % | No | % | |
| 1 | Rural | 46 | 47.92 | 665 | 39.12 | 14 |
| 2 | Urban | 50 | 52.08 | 1035 | 60.88 | 21 |
| **Total** | | 96 | 100.00 | 1700 | 100.00 | 18 |

The study intends to examine the library book transactions by PG Physics students with respect to their region. It is obvious from Table 3 that out of 96 PG Physics students, most (52.08%) of the students are from urban area where as 47.92percent of the students are from rural area. Majority (60.88%) of the urban area students have more book transactions with an average of 21 books whereas rural area students have 39.12percent book transactions with an average of 14 books. It can be concluded that urban area students are borrowed more number of books when compared to rural area students.

**Table 4: Library book transactions by PG Physics students according to authorship pattern**

| Authorship Pattern | Book Transactions | |
|---|---|---|
| | **No.** | **%** |
| Single | 1452 | 85.41 |
| Double | 182 | 10.71 |
| More than two | 66 | 3.88 |
| **TOTAL** | **1700** | **100.00** |

Table 4 displays authorship pattern wise usage of books by the PG Physics students. The authorship pattern is divided in to single, double and more than two authors written books. Out of 1700 book transactions, most of the books (85.41%) are written by single authors followed by two author books (10.71%) and remaining books are written by more than two authors (3.88%). It can be concluded that majority of the P.G students are used single authors written books in Physics.

**Table 5: Library book transactions by PG Physics students according to foreign or Indian authors**

| Foreign or Indian authors | Book Transactions | |
|---|---|---|
| | **No.** | **%** |
| Foreign | 1328 | 78.12 |
| Indian | 372 | 21.88 |
| **Total** | **1700** | **100.00** |

In order to know whether the PG Physics students are using the books written by Indian authors or Foreign authors, the book transactions are divided into two groups namely Indian author books and Foreign author books based on the country of author's origin belongs. It can be observed from Table 5 that most of the book transactions (78.12%) are written by foreign authors and remaining 21.88

percent book transactions are written by Indian authors. It can be concluded that most of the PG. students are using large number of books written by foreign authors when compared to Indian authors.

**Table 6: Library book transactions by PG Physics students according to their year of publication (Intervals)**

| Year of publication (Intervals) | Book Transactions | | Cumulative | |
|---|---|---|---|---|
| | No. | % | No. | % |
| 1950-1955 | 24 | 1.41 | 24 | 1.41 |
| 1956- 1960 | 30 | 1.72 | 54 | 3.17 |
| 1961- 1965 | 56 | 3.29 | 110 | 6.46 |
| 1966-1970 | 84 | 4.94 | 194 | 11.41 |
| 1971-1975 | 116 | 6.82 | 310 | 18.24 |
| 1976-1980 | 154 | 9.06 | 464 | 27.29 |
| 1981-1985 | 106 | 9.24 | 570 | 33.57 |
| 1986-1990 | 118 | 6.94 | 688 | 40.47 |
| 1991-1995 | 92 | 5.41 | 780 | 45.88 |
| 1996-2000 | 190 | 11.18 | 970 | 57.06 |
| 2001-2005 | 190 | 11.18 | 1160 | 68.24 |
| 2006-2010 | 250 | 14.71 | 1410 | 82.94 |
| Up to 2016 | 290 | 17.06 | 1700 | 100.00 |

Table 6 depicts that most of the book transactions (17.06%) done by PG. Physics students are being published during the period of 2011-2016. It is also evident from the table that 14.71 percent of books transactions are being published during the period of 2006-2010 followed by 11.18 percent during the period of 2001 to 2005, 11.18 percent during 1996-2000, 9.24 percent during 1981-1985, 9.06 percent during 1976-1980, 6.94 percent during 1986-1990,6.82 percent during 1971-1975, 5.41 percent during 1991-1995, 4.94 percent during 1966-1970,3.29 percent during1961-1965, 1.72 percent during1956- 1960 and the remaining

1.41percent during the period of 1950-1955. It can be concluded that, most of the book transactions (17.06%) done by PG Physics students are being published during the period of 2011-2016.

**Table 7: Library book transactions by PG Physics students according to the name of the publisher**

| S.No. | Name of the Publisher | Rank | Book Transactions | | Cumulative | |
|---|---|---|---|---|---|---|
| | | | No | % | No | % |
| 1 | Prentice Hall of India | 1 | 216 | 12.71 | 216 | 12.71 |
| 2 | McGraw Hill | 2 | 186 | 10.94 | 402 | 23.65 |
| 3 | Cambridge University Press | 3 | 160 | 9.41 | 562 | 33.06 |
| 4 | John Wiley &Sons | 4 | 122 | 7.18 | 684 | 40.24 |
| 5 | Springer &Verlog | 5 | 108 | 6.35 | 792 | 46.59 |
| 6 | Oxford University Press | 6 | 36 | 2.12 | 828 | 48.71 |
| 7 | Narosa Publishers | 7 | 32 | 1.88 | 860 | 50.59 |
| 8 | Wiley Eastern | 8 | 30 | 1.76 | 890 | 52.35 |
| 9 | Routledge | 8 | 30 | 1.76 | 920 | 54.12 |
| 10 | Pearson | 8 | 30 | 1.76 | 950 | 55.88 |
| 11 | Harper and Row | 9 | 28 | 1.65 | 978 | 57.53 |
| 12 | Dover Publications | 9 | 28 | 1.65 | 1006 | 59.18 |
| 13 | Vikas Publishers | 10 | 20 | 1.18 | 1026 | 60.35 |
| 14 | Addison Wesley | 11 | 18 | 1.06 | 1044 | 61.41 |
| 15 | University Press | 12 | 14 | 0.82 | 1058 | 62.24 |

| | | | | | | |
|---|---|---|---|---|---|---|
| 16 | W H Freeman | 12 | 14 | 0.82 | 1072 | 63.06 |
| 17 | C.B.S Publications | 12 | 14 | 0.82 | 1086 | 63.88 |
| 18 | Bharath Bhavan Publishers | 12 | 14 | 0.82 | 1100 | 65.27 |
| 32 | 28 Publishers 5 each | 13 | 140 | 8.24 | 1240 | 72.94 |
| 42 | 20 Publishers 4 each | 14 | 80 | 4.71 | 1320 | 77.65 |
| 55 | 26 Publishers 3 each | 15 | 78 | 4.59 | 1398 | 82.24 |
| 70 | 30 Publishers 2 each | 16 | 60 | 3.53 | 1458 | 85.76 |
| 186 | 242 Publishers 1 each | 17 | 242 | 14.24 | 1700 | 100.00 |

The study intends to examine the library book transactions by PG Physics students with respect to the name of the publisher. It can be noticed from Table 7 that most of the book transactions (12.71%) by PG Physics students are published by "Prentice Hall of India" followed 10.94 percent by "McGraw Hill", 9.41 percent by "Cambridge University Press", 7.18 percent by "John Wiley & Sons" publisher and so on. The publisher 'Prentice Hall of India' gets first rank for more number of book transactions by PG Physics students. The publishers 'McGraw Hill', 'Cambridge University Press' and 'John Wiley & Sons' get 2nd,3rd, and 4th ranks respectively. The publishers 'Springer &Verlag',' Oxford University Press' and 'Narosa publishers' gets $5^{th}$,$6^{th}$ and $7^{th}$ ranks for being used more number of times. It can be concluded that these publishers 'Prentice Hall of India', 'McGraw Hill', 'Cambridge University Press', 'John Wiley & Sons', Springer & Verlag',' Oxford University Press' and 'Narosa publishers' are contributing half of the reading materials (50.59%) for the PG students of Physics.

**Table 8: Library Book Transactions by the PG Physics students according to the Country of their Publication**

| Name of the Country | Book Transactions | | Cumulative | |
|---|---|---|---|---|
| | No. | % | No. | % |
| USA | 628 | 36.94 | 628 | 36.94 |
| India | 372 | 21.68 | 1000 | 58.82 |
| UK | 344 | 20.24 | 1344 | 79.06 |
| Singapore | 148 | 8.71 | 1492 | 87.77 |
| Australia | 76 | 4.47 | 1568 | 98.24 |
| The Netherlands | 52 | 3.06 | 1620 | 95.30 |
| Japan | 48 | 2.82 | 1668 | 98.12 |
| Russia | 24 | 1.41 | 1692 | 99.53 |
| Canada | 8 | 0.47 | 1700 | 100.00 |

The study intends to examine the library book transactions done by PG Physics students with respect to the country of their publication. It is evident from Table 8 that out of 1700 books transacted, a considerable per cent (36.94%) of the books transacted by the PG students of Physics were published from USA, followed by 21.68 per cent of books originating from India and the remaining used books were published from other foreign countries like 20.24 per cent of the books originating from UK, 8.71 per cent originating from Singapore, 4.47 per cent from Australia, 3.06 per cent from the Netherlands, 2.82 per cent from Japan, 1.41 per cent from Russia and the remaining 0.47 per cent were from Canada. It can be concluded that most of the PG. students of Physics heavily depended on the foreign books compared to the books published in India. It can also be concluded that they also depended mostly on the books published from India, USA and UK.

**Table 9: Library Book Transactions by PG Physics students according to Subject Books, Related and Unrelated Subject Books**

| Sl. No. | Subject | Book Transactions | | Cumulative | |
|---|---|---|---|---|---|
| | | No. | % | No. | % |
| 1 | **Physics** | 1394 | 82.00 | 1394 | 82.00 |
| **A. Related Subjects 14.23** | | | | | |
| 1 | Mathematics | 90 | 5.29 | 1484 | 87.29 |
| 2 | Statistics | 60 | 3.53 | 1544 | 90.82 |
| 3 | Chemistry | 42 | 2.47 | 1586 | 93.29 |
| 4 | Computer Science | 30 | 1.76 | 1616 | 95.05 |
| 5 | Biotechnology | 20 | 1.18 | 1636 | 96.23 |
| **B. Unrelated Subjects 3.77** | | | | | |
| 1 | Political Science | 28 | 1.65 | 1664 | 97.88 |
| 2 | History | 16 | 0.94 | 1680 | 98.82 |
| 3 | Philosophy | 10 | 0.59 | 1690 | 99.41 |
| 4 | Literature | 10 | 0.59 | 1700 | 100.00 |

In order to know whether the Physics students were using Physics subject books or other books also, the book transactions were divided into three groups' namely Physics books, related subject books and unrelated subject books based on their book transactions records. Table 9 reveals that most (82.00%) of the books used by Physics students were from the field of Physics. In addition to Physics books, the PG students also used 14.23 per cent books belonging to related subjects and also 3.77 per cent to unrelated subjects.

The books used by them belonging to related subjects were Mathematics (5.29%) followed by 3.53 per cent of the books related to Statistics, 2.47 per cent related to Chemistry, 1.76 per cent related to Computer Science and the remaining 1.18 per cent of the books were related to the Biotechnology subject. The books used by them belonging to unrelated subjects were Political Science (1.65%), followed by 0.94 per cent of the books related to History, 0.59 per cent related to Philosophy and the remaining 0.59 per cent of the books were related to Literature. It can be concluded that the PG students of Physics were reading not only the books of their subject but also the books of related subjects. They also read books not related to their subject. These books might have been borrowed by them for the improvement of their knowledge or borrowed for their friends or relatives.

**Table 10: Library Book Transactions made by PG Physics students according to the Rank List of Most Frequently Used Books**

| Sl. No. | Name of the Book Title | Rank | Book Transactions | | Cumulative | |
|---|---|---|---|---|---|---|
| | | | No | % | No | % |
| 1 | Concepts of Physics, Varna H C | 1 | 104 | 6.12 | 104 | 6.12 |
| 2 | Classical Mechanics, Goldstein H | 2 | 88 | 5.18 | 192 | 11.3 |
| 3 | Quantum Mechanics, Powel J L | 3 | 78 | 4.59 | 270 | 15.89 |
| 4 | Signals and Systems, Oppenhein A V | 4 | 76 | 4.47 | 348 | 20.36 |
| 5 | Feynman Lectures on Physics, Feynman R | 5 | 70 | 4.12 | 418 | 24.48 |
| 6 | Basic Electronic Statistics, Theraja R L | 5 | 70 | 4.12 | 488 | 28.6 |
| 7 | Principles of Quantum Mechanics, Dirac P A | 5 | 70 | 4.12 | 558 | 32.72 |
| 8 | Mathematical Physics, Hassan S | 6 | 34 | 2.00 | 592 | 34.72 |
| 9 | Principles of Electronics, Mehta V K | 7 | 32 | 1.88 | 624 | 36.6 |
| 10 | Quantum Mechanics., Branden B W | 8 | 20 | 1.18 | 644 | 37.78 |

| Sl. No. | Name of the Book Title | Rank | Book Transactions | | Cumulative | |
|---|---|---|---|---|---|---|
| | | | No | % | No | % |
| 11 | Electromagnetic Theory., Chopra K K | 8 | 20 | 1.18 | 664 | 38.96 |
| 12 | Classical Mechanics, Tiwari R | 8 | 20 | 1.18 | 684 | 40.14 |
| 13 | Electronic Principles, Alvin A | 8 | 20 | 1.18 | 704 | 41.32 |
| 14 | Lectures on Electromagnetism., Das A | 9 | 18 | 1.06 | 722 | 42.38 |
| 15 | Electromagnetism, Pramanic A | 9 | 18 | 1.06 | 740 | 43.44 |
| 16 | Mathematics for Physicists, Dinnery P | 10 | 16 | 0.94 | 756 | 44.38 |
| 17 | Problems and Solutions on Mechanics, Lim Young Kuo | 10 | 16 | 0.94 | 772 | 45.32 |
| 18 | 2000 Solved Problems in Electromagnetics, Nager S | 10 | 16 | 0.94 | 788 | 46.26 |
| 19 | Modern Quantum Mechanics, Sukraj J J | 11 | 14 | 0.82 | 802 | 47.08 |
| 20 | Quantum Bits and Its Secrets, March O | 11 | 14 | 0.82 | 816 | 47.9 |
| 21 | Mathematical Methods for Physics, Riley K F | 11 | 14 | 0.82 | 830 | 48.72 |
| 22 | Electronic Devices and Circuits, Millman J | 11 | 14 | 0.82 | 844 | 49.54 |
| 23 | Statistical Physics, Rief F | 11 | 14 | 0.82 | 858 | 50.36 |
| 24 | Statistical Mechanics, Huang K | 11 | 14 | 0.82 | 872 | 51.18 |
| 25 | Advanced Quantum Mechanics, Sukraj J J | 11 | 14 | 0.82 | 886 | 52 |

| Sl. No. | Name of the Book Title | Rank | Book Transactions | | Cumulative | |
|---|---|---|---|---|---|---|
| | | | No | % | No | % |
| 26 | Classical Electromagnetic Dynamics, Jackson J | 12 | 12 | 0.71 | 898 | 52.71 |
| 27 | Classical Electromagnetic Radiation, Marian J | 12 | 12 | 0.71 | 9104 | 53.42 |
| 28 | Mathematical Physics with numerous Examples, Rajput | 12 | 12 | 0.71 | 922 | 54.13 |
| 29 | Vibrations and Waves, Freech Antony | 12 | 12 | 0.71 | 934 | 54.84 |
| 30 | Linear Algebra, Kwak Ian Ho | 12 | 12 | 0.71 | 946 | 55.55 |
| 60 | 30 Titles 5 times | 13 | 150 | 8.82 | 1096 | 64.37 |
| 90 | 30 titles 4 times | 14 | 120 | 7.06 | 1216 | 71.43 |
| 140 | 50 titles 3 Times | 15 | 150 | 8.82 | 1366 | 80.25 |
| 244 | 104 Titles 2 times | 16 | 208 | 12.24 | 1574 | 92.59 |
| 370 | 126 Titles 1 Times | 17 | 126 | 7.41 | 1700 | 100 |

The study intends to examine the library book transactions made by Physics students with respect to the most frequently used books. Table 10 illustrates that the PG students of Physics used 370 titles during the period of their study. It is also evident from table that the book entitled 'Concepts of Physics' written by Varma H C was used more number of times compared to other books. Hence it got first rank for being used for more number of times. The books entitled 'Classical Mechanics' written by Goldstein H, 'Quantum Mechanics' written by Powel J Land .Signals and Systems' written by Oppenhein A V got 2nd, 3rd and 4th ranks respectively. The books entitled 'Feynman Lectures on Physics' written by Feynman R, 'Basic Electronic Statistics' written by Theraja R L and Principles of quantum Mechanics' written by Dirac P A got an equal rank of 5 for being used for more number of times by PG students. All these titles accounted for 32.72 per cent of total borrowings. The first 23 titles mentioned in the table accounted for 50.36 per cent of total borrowings. That means only a few titles were being used frequently by the

PG students of Physics. The average rate of productivity (the ratio of the number of transactions to the number of book titles) in each group is presented in Table 11.

**Table 11: Productivity of Book Titles in Physics**

| Sl. No. | Percentage of Book Transactions | No. of Transactions | No. of Titles | Percentage of Titles | Average Productivity of Titles |
|---|---|---|---|---|---|
| 1 | 0-25% | 416 | 5 | 1.35 | 83.20 |
| 2 | 26-50% | 442 | 18 | 4.86 | 24.56 |
| 3 | 51-75% | 418 | 87 | 23.51 | 4.80 |
| 4 | 76-100% | 424 | 260 | 70.27 | 1.63 |
| Total | | 1700 | 370 | 100.00 | 4.59 |

The results presented in Table 11 show that the first 5 titles had contributed 25 per cent of transactions with an average productivity of 83.20 transactions per title. The average productivity had gone down considerably to 1.63 transactions in the fourth group. The applicability of Bradford's Law of Scattering (graphical formulation) to citation data (Ranked list Table No. 11) in physics was tested by plotting Bradford's bibliograph. The Bradford's bibliograph for physics is presented in **Figure 1.**

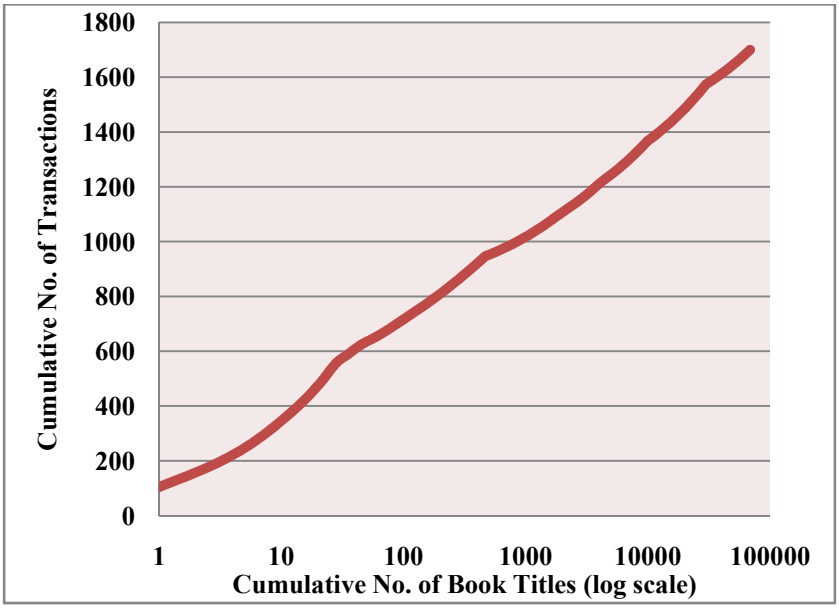



**Figure 1: Bradford's Bibliograph for Physics**

The distribution of book titles and the corresponding number of transactions in the three Bradford's zones for physics is presented in Table 12.

**Table 12: Bradford's Zones for Physics**

| Zones | Number of | | Cumulative No. of | |
|---|---|---|---|---|
| | Titles | Transactions | Titles | Transactions |
| 1 | 7 (1.89) | 556 | 7 | 556 |
| 2 | 62 (16.76) | 576 | 69 | 1132 |
| 3 | 301 (81.35) | 568 | 370 | 1700 |

It is observed from the Table 12 that there were 7 titles in the nucleus and they were the most productive titles devoted to physics sharing 1.89 per cent of the total book titles. The next zone was represented by 62 titles sharing 16.76 per cent of the total book titles, and the last zone was represented by 301 titles sharing 81.35 per cent of the total titles. Each zone had approximately one third of the transactions. According to Bradford, the zones identified formed an approximately

geometric series in the form 1: n: $n^2$. The relationship of each zone in the present study was in the ratio of 7: 62: 301. Hence, this did not fit into Bradford's distribution.

## Findings

1. Majority (52.35%) of the physics book transactions are done by the II year students with on average of 19 books during the period of their study.
2. Out of 96 PG physics students most (46) of the Other Category students (EBC, PwD, NRI etc,.) borrowed more books (50.65%) with an average of 39 books.
3. Out of 96 PG Physics students, most (28) of the male students and female (18) students belong to Other Categories (EBC, PwD, NRI etc.,).
4. Out of 861 borrowed books, male students borrowed 445 books with 26.18 percent and remaining 416 books are borrowed by female students with 24.46 percent.
5. Out of 96 PG Physics students, most (52.08%) of the students are from urban area where as 47.92percent of the students are from rural area.
6. Out of 1700 book transactions, most of the books (85.41%) are written by single authors.
7. Most of the book transactions (78.12%) are written by foreign authors.
8. Most of the book transactions (17.06%) done by PG. Physics students are being published during the period of 2011-2016.
9. Most of the book transactions (12.71%) done by PG Physics students are published by "Prentice Hall of India".
10. Out of 1700 books transacted, a considerable per cent (36.94%) of the books transacted by the PG students of Physics were published from USA.
11. Most of the PG students of Physics heavily depended on the foreign books compared to the books published in India.
12. Most (82.00%) of the books used by Physics students were from the field of Physics.
13. The books used by them belonging to related subjects were Mathematics (5.29%).
14. The books used by them belonging to unrelated subjects were Political Science (1.65%).

15. The PG students of Physics used 370 titles during the period of their study.
16. The book entitled 'Concepts of Physics' written by Varma H C was used more number of times compared to other books.
17. The first 5 titles had contributed 25 per cent of transactions with an average productivity of 83.20 transactions per title.
18. There were 7 titles in the nucleus and they were the most productive titles devoted to physics sharing 1.89 per cent of the total book titles.

## Conclusion

Though there is a paradigm shift towards the adoption of digital media, print books currently dominate (90 per cent)the publishing landscape in India(The Statesman Indian English-language daily newspaper). This study gives an insight into the IGM University library books usage among PG Physics students of first and second year. The results of this study give a remarkable revelation. It is to the young people of today that libraries are of the greatest benefit. The general conclusion to emerge from this study was that the students are maximally utilized the library. There was a progressive increase in the number of books borrowed and consulted from the year of 2011-16. However, the study shows that foreign author book transactions are high when compared to Indian author books. Hence, authors are to be encouraged to write books collaboratively by publishers and librarians to get qualitative and quantitative books. Analysis of data indicates that most of the students are using single author books. Therefore, University Grants Commission (UGC), CSIR, ICSSR and National Book Trust of India should provide grants liberally for Indian authors for publishing books at PG level.When compared to first year students, second year students were done more book transactions. Hence, there is a great need to create awareness among the first year students regarding availability, accessibility and usefulness of books in the library for their subject and general purpose too. Revolution in the field of library should be increased with the help of these suggestions so that reading culture can be created in the field of education in particular and in the people of the society in general.

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# The Profound Role of Reading Attitudes of the Students in Accomplishing the UN's SDG 2030: Assertions by PIRLS

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## Abstract

*The United Nations prime motto is to serve the humanity in every possible way, by eradicating the miseries of each and every Individual. As a huge and substantial step towards achieving the motto, UN has framed the Sustainable Development Goal or the SDG in 2015 as the target to be achieved by 2030.There are 17 goals which ensure basic life necessities for all. The prime goal is ensuring equitable, quality education for all. The Quality Education is a mirage, without the Library and Reading services. A well built Reading attitude in child will render all the qualities and tendencies to progress academically and thereafter in socio-Cultural Economic spheres of life. This is ascertained by PIRLS, Progress in International Reading Literacy studies. PIRLS is an Assessment, conducted by IEA(International Association for Evaluation of Educational Achievement).The Assessments are for the fourth grade students among all the seventy participating countries, conducted once in every four years .The results of the PIRLS Assessment helps to enhance the reading literacy and weeding out the obstacles in the way of achieving the SD Goals 2030.*

**Keywords**:- *SDG 2030, Reading Literacy, Reading attitudes, PIRLS, Equitable Quality Education.*

## Introduction

The UNO or the United Nations Organization strives for the up gradation of the standards of the life by their policies and goals. UN has framed 17 SDG goals to be achieved by 2030.They guarantee, basic necessities of Life to every global citizen, ensures the best Socio-Economic life standards and protection of the planet from pollution.

The fourth Goal is ensuring equitable, quality education and Life- long opportunities for all, which encompass well formed reading attitudes. The values of Reading habit and attitudes are always held high by eminent scientists and philosophers. Every Individual primarily requires reading skills to be successful in Socio-Cultural and Economic sphere of Life. For all the seventeen goals to be achieved, a well formed Reading Attitude is Indispensable for every responsible citizen.

## UN's SDG Journey

In 1945,by the completion of World War II, An International Organization was formed to maintain peace, Security and equal rights among all. UN is the world level co- operation, to promote the economic, social and cultural activities for the betterment of the countries. In June 1992, an" Earth summit" was organized among 178 countries with an objective to improve the human lives and the Environment protection. In 2000 the "Millennium Summit", was held in UN Head quarters and MDG or the Millennial Development Goals was elaborated to reduce poverty. In the year 2012 they set the task of building SDG on the MDG.

Transforming the world: 2030 Agenda for sustainable development with its 17 SDG's were adopted at the UN Sustainable development Summit in New York in September 2015.

## The SDG 17 Goals 2030

The 17 Goals are 1.No Poverty 2.Zero Hunger 3.Good Health and Well Being 4.Quality Education 5.Gender Equality 6.CleanWater and Sanitation 7.Affordable and Clean Energy 8.Decent Work and Economic Growth 9.Industry,Innovation and Infrastructure 10.Reduced Inequalities 11.Sustainable Cities and Communities 12.Responsible Production and Consumption 13.Climate Change 14.Life Below Water 15.Life on Land 16.Peace Justice and strong Institutions 17.Partnership for the goals.

The SD Goals can be categorized into three groups of.

a. *Goals for Individual Wellness & Development*:- The first eight goals are focused to assure every Individual's right for basic necessities of life. It ensures Food, Clean water, Good Health Hygiene, Quality and equitable education and a decent work for any global citizen to lead a life of good standards.

b. *Goals for the Socio-Economic Development*: - A Healthy Society's fabric is weaved with Economic growth, Industry, Innovation, Infrastructure, production and consumption with equalities. Every thread of the society fabric needs to be strong for sustainable cities and communities.

c. *Goals for the Rejuvenation & Protection of the Planet*: -The goals of "Life below water", "Life on land" and" Peace, Justice and strong Institutions" concentrates on the welfare of the Planet Earth and avoiding the deterioration by pollution and litter. The individual, the society and the Human community on the whole requires a safe, green planet to thrive.

**SDG 4 and its Components**: -

The sustainable development goal 4 is the pivotal goal which can positively influence all the goals.SDG 4 goal is "Ensure Inclusive and Equitable Quality Education and promoting Life-long Opportunities for all." The quality education is meaningless without acquiring the right reading attitudes by the youngsters.

The Reading attitudes are the tendencies of reading, adopted in one's own convenient way by each and every individual. The right reading attitude will give an urge to read the relevant resources of knowledge on a regular basis. Positive reading attitudes renders good feel about reading. If this attitude is inculcated in a right sense at the right time the individual will be highly benefitted for his Life time. The positive Reading attitude helps in "Inclusive Equitable education" as the disparities are dissolved with proper understanding. 'Quality' Education is also assured as the reading habit promotes the selection of right content by the authorized writers. Life-long Education is inculcated as said by Krashen (2004) "Good thinkers read more". Sensible readers follow Free Voluntary Reading (FVR) and Sustained Silence Reading (SSR) habits which lead to the Lifelong Opportunities for education and profession.

**PIRLS: Progress in International Reading Literacy Studies**

PIRLS is an International Assessment for Reading conducted among 70 countries by IEA and Boston college, Lynch school of Education, USA .IEA is the International Association for Evaluation of Academic Achievement. The fourth grade students,9-10 years old, are assessed for their Reading Literacy. India is a Non-Participant in PIRLS but still its applicable for the current scenario

Since 2001 the Assessment is being conducted once in every four years. The main objective is to assess the reading habits, attitudes and compare them internationally to gauge the policies adopted. As the reading habits form the foundation for Academic pursuits. In 2001 it had only 35 participant countries whereas in 2021 nearly seventy countries have participated. E-PIRLS is the assessment for Online reading which was initiated in 2016 as an option. The PIRLS 2016 results are available as the 2021 assessments results are yet to be compiled.

## PIRLS 2021

The Reading Literacy Assessment of 2021 has transitioned to digital based Assessment or e-PIRLS. As in previous tests the PIRLS 2021 has collected and reported information on home, teacher and school experiences in learning to read. The information collected is regarding Home environment, Students, Teachers and School atmosphere of learning reading, which is accessible as PIRLS Encyclopaedia.

This helps to identify the

1. Impact of new policies or modifications in the policies of every country. 2.The level of Reading Achievement in global context.3.Reflects the areas of weakness, thereby points out the need for modifications in policy and Implementation level.4.Change in the Approaches of the teachers and School towards students.

## PIRLS as a means to Achieve SDG 2030

In UN's report on "Measuring SDG 4 :How PIRLS can help" the possibilities of PIRLS to monitor and accomplish the SDG 4 is clearly explained which proves that the Reading Literacy and its components can help in achievement of Education goals and by sensitizing the students there is possibilities of reaching the other seventeen goals.

*SDG 4.1* Ensures free, equitable, quality in primary and secondary Education without gender differences.

PIRLS 2016 report says that eighty percent of grade 4 students score above the minimum/low international benchmark in reading Assessments. Thus the goal is almost reached.

*SDG 4.2*By 2030, Guaranteed access to early childhood development, care and pre-primary education equally for boys and girls.

PIRLS 2016 reports that there is appreciable participation in preschool reading activities by the pre-school toddlers in the results of the data.

*SDG 4.4* A substantial increase in the percentage of youth with relevant technical, vocational skills for employment and Entrepreneurship

PIRLS 2016: Clarifies that there is a rise in the digital literacy skills which is explicit in the enhancement of the other skills, in the report. There is gender equality in information reading skills.

*SDG 4.5*: Elimination of gender disparities, equal access to all levels of education including Physically challenged ,Indigenous people and children.

PIRLS 2016: High possibilities to reach the target soon, as indicated by the early reading Assessments in Indigenous languages .It is equally high in both girls and boys.

*SDG 4.* : Upgrade the education facilities by providing safe, Non-violent, Inclusive Effective Environment.

PIRLS 2016: Bullying is pointed out as a discouraging element in schools, which is clearly depicted in the data collected. PIRLS helps to monitor the impact of the act and thereby eliminate the root causes of Bullying which in turns improves the student's participation.

*SDG 4.c*: Assuring the availability of qualified, trained teachers in developing countries

PIRLS 2016: Assesses the Teacher's efficacy in terms of their approach towards students which in turn helps to know whether the teachers are trained and efficient. As per the data, trained teachers are very much contributive in Improving the students participation in academics.

## Conclusion

PIRLS Assessments are helpful in analyzing the entire context and environment of the reading literacy of the school students, in almost seventy countries the world. Though India is not a participant, the results are applicable for Indian context. The Education Environment is almost the same and equally influenced by the cultural and technological factors. The attainment of the SDG Goals is not too far and PIRLS will always remain as a substantial means to monitor and enhance the reading attitude thereby wipe out the hindrances in the attainment of the UN goals.

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# Battle with Covid: Role of Lis Associations in Continuing Education

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## ABSTRACT

*The whole world is suffering from the invisible situation termed as COVID. Each and every section of society is affected from it. Libraries has also affected by it. This study is designed keeping in mind the role of libraries and library associations during COVID 19. The online questionnaire was distributed among the officials of Library Associations in India. Responses of the respondents were analysed and interpreted with the help of MS Excel. Paper also identifies how these associations are advocating libraries as well as various initiatives taken by them to spread awareness. This paper is an attempt to identify the role of library associations in the COVID pandemic and how they are advocating libraries.*

**KEYWORDS** *Libraries, COVID-19, LIS Association*

## INTRODUCTION

Libraries are non- profit social institutions that is working continuously since very past decades for the social welfare. The sudden spread of the COVID pandemic has affected life across the world. Libraries recognized the challenges posed by the COVID pandemic and supported the education system in continuing education even in the face of a health crisis. Library associations plays a crucial role in the upliftment of LIS professionals and profession as a whole. Even in the lockdown situation, the library association has not forgotten its role of promoting the library profession. Various online events and webinars have been organized by the associations to inform and update the library profession and society during the lockdown.

## OBJECTIVES

To identify role of library association during COVID

To identify how they are advocating libraries

To know how the association's impact and performance for their various initiatives taken during the COVID 19 pandemic are measured

To know the various initiatives taken by the associations during COVID

## RESEARCH METHODOLOGY

This is a survey type study for which online questionnaire (Google form) were distributed over the official email of the various LIS Association working in the India. Further, received response was analyzed with the help of MS-Excel and MS-Word.

## SCOPE AND LIMITATION

The various LIS Associations working in India were considered for the study.Views and role of LIS Associations were observed that may be either working at State level or National level.

## DATA ANALYSIS AND INTERPRETATION

### Response Received

The online questionnaire was distributed over official email of LIS Association and out of them only 8s were received. Therefore, only those were taken into the study.

| Association/ Organization Name | Position at Association/ Organization |
|---|---|
| Gujarat Librarian Association | President |
| Central Government Library | President |

| Association | |
|---|---|
| Bengal Library Association | Treasurer |
| Young Librarians Association YLS. | President |
| Indian Library Association | President |
| Gulbarga University | President |
| Society for Promotion of Library Professionals, Uttarakhand | President |
| Society for Promotion of Libraries(SPL), Uttar Pradesh | President |

Table 1

**Age- Group of the respondents**

| Age | Group |
|---|---|
| 20-30 years | 0 |
| 31-40 years | 0 |
| 41-50 years | 5 |
| 51-60 years | 2 |
| 61 year and above | 1 |

Table 2

There was total 8 respondents. From the above Table Most of them were belong to 41-50 years age group. 2 respondents were from 51-60 years and only 1 was very senior who belong to 61 years and above age group.

**View regarding the role of Library Associations**

| View regarding the role of Library Associations | Response |
|---|---|
| Important | 8 |
| Neutral | 0 |
| Not Important | 0 |

The above table shows that all the respondents agreed with the opinion thatRole of Library Associations is Important.

**Satisfaction with contribution of LIS Association**

| Satisfaction with the initiatives taken by the various Library Associations to support the libraries during pandemic | Response |
|---|---|
| Yes | 5 |
| Maybe | 2 |
| No | 1 |

From the respondents the question was asked whether they are satisfied with the initiatives taken by the other Associations related to Library Profession to support Libraries during pandemic. The study shows that the majority of respondents were agreed. Whereas 13% were not satisfied and 25% were not sure.

**Technical strengths of Association's Program**

| Technical strengths of the association's programs | Response |
|---|---|
| Association is able to adapt programs to changing needs of constituency and to extend service delivery to additional constituencies | 6 |
| Association is recognized as having significant experience in sector and contributing to sector growth | 2 |

**Measurement of association's impact and performance for their various initiatives taken during the COVID 19 pandemic**

| Measurement of association's impact and performance | Response |
|---|---|
| The association has not determined impact indicators or established baseline measurements | 0 |
| The association is aware of the value of evaluating its programs and is exploring how to measure impact | 4 |
| Studies are done that provide baseline measures, and these data are regularly confirmed and used. | 7 |

**Initiatives Taken by the Association in Support of the Library During the Pandemic Period**

| Initiatives taken by the association in support of the library during the pandemic period | Response |
|---|---|
| Webinar | 8 |
| Workshops | 3 |
| Training | 2 |
| Awareness Program | 1 |

**Satisfaction with the association's initiative to achieve the stated mission during this period**

| Satisfaction with the association's initiative to achieve the stated mission during this period | Response |
|---|---|
| Yes | 6 |
| No | 0 |
| Maybe | 2 |

## CONCLUSION

Library associations have been playing important role in promoting and advocating libraries and library profession from the very past. The associations proved to be fighter at the time of COVID. The result of the paper shows the positive response of the respondents regarding the role and satisfaction of LIS associations in contributing at the time of COVID. Various initiatives have been taken by the LIS associations during COVID to continue education. The number of webinars were conducted more than workshops and training. Most of the associations are satisfied with the initiative taken by them to accomplish the mission of the library association to promote and support the library profession as a whole.

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# Webinars as a Platform for Lis Professional's Continuing Education: A Study of Delnet Webinar Programmes-An Analytical Study

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## ABSTRACT

*This paper analyses the webinar programmes conducted by the DELNET during the COVID-19 period (2020 & 2021). There are 122 different webinar programmes conducted in 21 states of India and overall 24152 library professionals participated in this webinar sessions. The findings of the study indicates the most of the 12.94% participants participated in December, 2021 out of 8 webinars, amidst 13 webinars, 10.94% participants participated in December, 2020, out of 12 webinars, 8.44%, participated in September, 2021. The majority 26.23% of the webinars conducted in New Delhi union territory, following 20.49% of the webinars conducted for Maharastra state. DELNET providing its services to 33 states in India but the webinars conducted during the Covid-19 period i.e. 2020 & 2021 in 21 states. The majority 41.35% of them participated from New Delhi. An analysis of the webinars conducted during the peak of Covid-19 is made from different angles and further some suggestions to get their maximum benefits are also given to the LIS professionals in future.*

## Introduction

ICT has provided us numerous opportunities through which library & information centers could provide their services accurately at the faster rate. One of the benefits of ICT is face to face conversation without meeting physically. Its benefit has been enchased so much by organizations, institutes and the associations in arranging

webinars. Though the webinars were in vogue in earlier times, but its use has become frequent during COVID-19 effect, where the persons could not meet physically because this is communicable disease. Thus, today's mushroom growth of Webinars is seen. A 'Webinar' that is a combination of 'web' and 'seminar' is an event that is held virtually and that is attended exclusively by an online audience. It is distinguished from a webcast that also includes the presence of a physical audience. However, web event, online seminar, webcast, web lecture and virtual event (https://www.webinar.nl/en/webinars/what-is-a-webinar/) are some of the other terms used for webinars.

A webinar combines some kind of educational presentation or training on the Internet but it is one way presentation of the instructor or speaker to the participants, who usually sign up for and pay for the webinar. However, there may be a question and answer session at the end. Nowadays, webinars are becoming very popular because they are inexpensive and easy to organize. They can attract a large number of participants because no one has to travel to get to a webinar or make any special arrangements for stay and hospitalities (https://www.tellonline.org/articles/advantages-anddisadvantages- of-webinars/en/). In webinars, the participants may follow them via a personal computers, Mac, tablet or Smartphone, and can see and hear the speakers. Further, the PowerPoint presentation can also be broadcasted which run in addition to the video images along with the use of the screen capture functionality that enables to show viewers an application or website.

**Developing Library Network (DELNET)**

Developing Library Network (DELNET) is a major resource sharing library network in India connecting more than 7300 libraries in 33 states in India and few other countries. DELNET is devoted to the modernisation and networking of libraries since establishment of 1988. It was registered as a society in 1992. It is located in Jawaharlal Nehru University Campus, New Delhi with prime motto of "Networking Libraries, Sharing and Spreading Knowledge" for the past 29 years. The main objectives of DELNET is to promote resources sharing among the member libraries by collecting, storing and disseminating information and by offering networked library services to users; to undertake research in the area of information science and technology, offer technical guidance of member libraries on collecting, storing, sharing and disseminating information; co-ordinate efforts for suitable collection development; facilitate and promote delivery of documents, etc. DELNET also launched Discovery Services and Knowledge Gainer Portal.

## What is Webinar?

The term webinar is short for Web-based Seminar, a presentation, lecture, work-shop or seminar that is transmitted over the Web, specifically a portmanteau of web & seminar, to describe a specific type of web conference (Wikipedia). 'Webinar' is a union of 'web + seminar' which simply means a seminar over the internet. This software is a remarkable innovation in the field of technology which offers a platform for people to interact and collaborate over vast geographical boundaries through World Wide Web. This platform offers a two-way communication leading to higher effectiveness and involvement by the audience. Typically online class comprise of a show facilitated by a specialist co-op on a web server. The connection of the online link is imparted to the participants who can sign on to the webpage and take part in it. The Webinar stage has as of now cut a specialty for itself in the field of business and has now begun being use in instruction field too. The central element of an online class is its capability to talk about and share data. Offering an all inclusive resource for communicating with a variety of specialists, this stage gives an extraordinary allure for its clients

## Features of Webinars

Various features are associated with the webinars–some of them are (https://www.webinar.nl/en/webinars/benefits-of-webinars/):

### Direct contact with target group

A webinar can reach and engage a very specific target group and also allow them to ask questions. An insight may also be gained through interaction during a webinar with target group. If taken seriously, one can really get to know the audience, unlike during lower quality webinars or physical meetings and events where attendees often merely listen passively.

### Reach target group

Live and Afterwards: Since each webinar can also be watched on-demand, webinar may give the opportunity to continue to reach the target group when the broadcast is over. It also increases both the reach and the impact of send message. If a well-designed webinar is search engine optimized, then it can be found easily via Google.

### Interaction with target group

Webinars enable to utilize polls, chats and calls-to-action, or to show the viewers PowerPoint slides or videos that make the webinar more interactive. It provides greater impact of sent messages.

**Save Time and Money**

A webinar eliminates the need of travelling, and also the arrangements of staying, hospitalities etc. because it is conducted online. Thus, it makes easier and cheaper for target group to be engaged by the message. It also cut downs the costs much lower than organizing a physical event and hiring the venues for them.

**Objectives of the study**

- To ascertain the number of webinars organized by the DELNET, during covid-19 period;
- To know the number professional participated DELNET webinar programmes;
- To know the titles of the webinars on which they are conducted.
- To ascertain the state-wise and month-wise webinars conducted by DELNET

**Methodology**

The data were collected from the information hosted over https://delnet.in/latest-programmes.html personally captured the information for two years period i.e. 2020 and 2021. There are 122 different webinars conducted by DELNET. Then, data were tabulated and analyzed as per the objectives framed for the study. However, this study is restricted to the webinars arranged in the field of Library & Information Science.

**Table-1: Types of webinars conducted by DELNET**

| S. No. | Type of Webinar | 2020 | 2021 | Total | Percentage |
|---|---|---|---|---|---|
| 1 | DELNET Award Function | 1 | | 1 | 0.82 |
| 2 | DELNET Book Talk | | 3 | 3 | 2.46 |
| 4 | DELNET Collaboration Training Programme | | 2 | 2 | 1.64 |
| 5 | DELNET Collaboration Webinar | 5 | 19 | 24 | 19.67 |
| 6 | DELNET Networked Resources & Services | 41 | 49 | 90 | 73.77 |
| 7 | NACLIN | 1 | 1 | 2 | 1.64 |
| | Total | 48 | 74 | 122 | 100 |

*Source: https://delnet.in/latest-programmes.html*

It is evident from the table-1 that the majority 73.77% of the webinars conducted on DELNET Networked Resources & Services following 18.27% of the webinars on

DELNET Collaboration with different institutions or eminent people. 2.46% of the webinars conducted on Book talks, 1.64% of the webinars conducted on DELNET Collaboration Training Programme and NACLIN and one programme i.e. 0.82% of the conducted on DELNET award function.

**Table-2: Number of webinars and number of participants participated in DELNET webinars**

| S.No. | Year & Month | No. of webinars | No. of participants | Percentage |
|---|---|---|---|---|
| 1 | 2020 August | 7 | 1278 | 5.29 |
| 2 | 2020 September | 4 | 673 | 2.79 |
| 3 | 2020 October | 11 | 1298 | 5.37 |
| 4 | 2020 November | 13 | 1805 | 7.47 |
| 5 | 2020 December | 13 | 2642 | 10.94 |
| 6 | 2021 January | 5 | 1094 | 4.53 |
| 7 | 2021 February | 7 | 1735 | 7.18 |
| 8 | 2021 March | 6 | 1096 | 4.54 |
| 9 | 2021 April | 3 | 471 | 1.95 |
| 10 | 2021 June | 2 | 565 | 2.34 |
| 11 | 2021 July | 6 | 1513 | 6.26 |
| 12 | 2021 August | 7 | 1501 | 6.21 |
| 13 | 2021 September | 12 | 2038 | 8.44 |
| 14 | 2021 October | 11 | 2005 | 8.30 |
| 15 | 2021 November | 7 | 1312 | 5.43 |
| 16 | 2021 December | 8 | 3126 | 12.94 |
| | Total | 122 | 24152 | 100 |

*Source: https://delnet.in/latest-programmes.html*

Table-2 shows the number of webinars and number of participants participated in DELNET webinars. The most of the 12.94% participants participated in December, 2021 out of 8 webinars, amidst 13 webinars, 10.94% participants participated in December, 2020, out of 12 webinars, 8.44%, participated in September, 2021, 11 webinars, 8.3% participated in October, 2021, amidst 13 webinars 7.47% participated in November, 2020, participated, amidst 7 webinars, 7.18% participated in February, 2021, amidst 6 webinars, 6.26% participated in July, 2021, amidst 7 webinars, 6.21% participated in August, 2021, amidst 7 webinars, 5.43% participated in November, 2021, amidst 11 webinars, 5.37% participated in October, 2020, amidst 7 webinars, 5.29% participated in August,2020, amidst 6 webinars, 4.54% participated in March, 2021, amidst 5 webinars, 4.53% participated in January, 2021, amidst 4 webinars, 2.79% participated in September,

2020, amidst 2 webinars, 2.34% participated in June, 2021 June, and amidst 3 webinars, 1.95% participated in April, 2021

**Table-3: State-wise number of webinars conducted**

| S.No. | State | No. of webinars | Percentage |
|---|---|---|---|
| 1 | Andhra Pradesh | 2 | 1.64 |
| 2 | Assam | 1 | 0.82 |
| 3 | Bhutan | 1 | 0.82 |
| 4 | Chandigarh | 2 | 1.64 |
| 5 | Goa | 1 | 0.82 |
| 6 | Gujarat | 1 | 0.82 |
| 7 | Haryana | 2 | 1.64 |
| 8 | Jammu | 2 | 1.64 |
| 9 | Jharkhand | 1 | 0.82 |
| 10 | Karnataka | 10 | 8.20 |
| 11 | Kerala | 10 | 8.20 |
| 12 | Madhya Pradesh | 7 | 5.74 |
| 13 | Maharastra | 25 | 20.49 |
| 14 | New Delhi | 32 | 26.23 |
| 15 | Odisha | 3 | 2.46 |
| 16 | Punjab | 3 | 2.46 |
| 17 | Rajasthan | 2 | 1.64 |
| 18 | Tamil Nadu | 9 | 7.38 |
| 19 | Telangana | 5 | 4.10 |
| 20 | Uttar Pradesh | 2 | 1.64 |
| 21 | Uttarakhand | 1 | 0.82 |
| | **Total** | **122** | 100 |

*Source: https://delnet.in/latest-programmes.html*

It is evident from the table-3 that the majority 26.23% of the webinars conducted in New Delhi union territory, following 20.49% of the webinars conducted for Maharastra state, 8.2% of the webinars conducted for Karnataka state, 8.2% of the webinars conducted for Kerala state, 7.38% of the webinars conducted for Tamil Nadu state, 5.74% of the webinars conducted for Madhya Pradesh state, 4.1% of the webinars conducted for Telangana state, 2.46% of the webinars conducted for Odisha and Punjab, state, 1.64% of the webinars conducted for Andhra Pradesh, Chandigarh, Haryana, Jammu, Rajasthan and Uttar Pradesh, states, 0.82% of the webinars conducted for Assam, Bhutan, Goa, Gujarat, Jharkhand and Uttarakhand states

**Table-4: State-wise number of participants**

| S.No. | State | No. of Participants | Percentage |
|---|---|---|---|
| 1 | Andhra Pradesh | 400 | 1.66 |
| 2 | Assam | 96 | 0.40 |
| 3 | Bhutan | 42 | 0.17 |
| 4 | Chandigarh | 89 | 0.37 |
| 5 | Goa | 195 | 0.81 |
| 6 | Gujarat | 142 | 0.59 |
| 7 | Haryana | 307 | 1.27 |
| 8 | Jammu | 106 | 0.44 |
| 9 | Jharkhand | 686 | 2.84 |
| 10 | Karnataka | 1745 | 7.23 |
| 11 | Kerala | 1298 | 5.37 |
| 12 | Madhya Pradesh | 589 | 2.44 |
| 13 | Maharastra | 3686 | 15.26 |
| 14 | New Delhi | 9988 | 41.35 |
| 15 | Odisha | 298 | 1.23 |
| 16 | Punjab | 212 | 0.88 |
| 17 | Rajasthan | 586 | 2.43 |
| 18 | Tamil Nadu | 1987 | 8.23 |
| 19 | Telangana | 1259 | 5.21 |
| 20 | Uttar Pradesh | 258 | 1.07 |
| 21 | Uttarakhand | 183 | 0.76 |
| | Total | 24152 | 100 |

*Source: https://delnet.in/latest-programmes.html*

Table-4 illustrates the state-wise number of participants, DELNET providing its services to 33 states in India. Webinars conducted during the Covid-19 period i.e. 2020 & 2021 in 21 states library professional are participated. The majority 41.35% of them participated from New Delhi, 15.26% of them participated from Maharastra, 8.23% of them participated from Tamil Nadu, 7.23% of them participated from Karnataka, 5.37% of them participated from Kerala, 5.21% of them participated from Telangana, 2.84% of them participated from Jharkhand, 2.44% of them participated from Madhya Pradesh, 2.43% of them participated from Rajasthan, 1.66% of them participated from Andhra Pradesh, 1.27% of them participated from Haryana, 1.23% of them participated from Odisha, 1.07% of them participated from Uttar Pradesh, 0.88% of them participated from Punjab, 0.81% of them participated from Goa, 0.76% of them participated from Uttarakhand, 0.59%

of them participated from Gujarat, 0.44% of them participated from Jammu, 0.4% of them participated from Assam, 0.37% of them participated from Chandigarh, and 0.17% of them participated from Bhutan.

## Conclusion

The impact of webinars in COVID-19 pandemic situation library professional shown more enthusiasm in online programmes conducted by DELNET in India. Webinars and online meetings provided the best avenue for teaching during this global crisis. Despite its several advantages, this paradigm shift came suddenly and without proper preparation from the educational organizations, and lacked proper regulations. Library professionals in our study showed initial interest with this shift, with higher participation in DELNET Networked Resources & Services and collaboration webinars. The findings of the study indicates the most of the 12.94% participants participated in December, 2021 out of 8 webinars, amidst 13 webinars, 10.94% participants participated in December, 2020, out of 12 webinars, 8.44%, participated in September, 2021. The majority 26.23% of the webinars conducted in New Delhi union territory, following 20.49% of the webinars conducted for Maharastra state. DELNET providing its services to 33 states in India but the webinars conducted during the Covid-19 period i.e. 2020 & 2021 in 21 states. The majority 41.35% of them participated from New Delhi.

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# Role of Librarian in Agricultural university Libraries

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**Abstract:** *The ICAR Library was founded in 1929 to help the Council achieve its goals. It is considered the mother of agricultural libraries in India because it houses significant materials in the fields of agriculture and allied subjects. Agricultural University libraries play a crucial role in India's agricultural education transition, allowing for long-term prosperity. Agriculture has risen to prominence among India's economic sectors. Agricultural institutions were established in order to provide education in the field of agriculture. Farmers, students, livestock producers, agricultural business organisations, research workers, and topic expert teachers benefit from agricultural libraries' e-resources and e-content, as well as information services. Librarians play a key role in delivering improved information services in the academic and research domains in today's technological age. This paper discussed the significance of librarians, or library professionals, in agricultural university libraries, as well as essential recommendations for improving the quality of agricultural university library services, which will aid in agricultural library development.*

**Keywords:** *Agricultural University Library, Agricultural University, Agricultural libraries, Agricultural librarian*

**Introduction:** India is an agricultural country and agriculture is the mainstay of the economy of India. Most of the people in India depend on agriculture product and agro-based industries. Agriculture libraries play an important role in making people related to agriculture aware of new information. In agricultural education and development, the role of agricultural university library and librarian working in agricultural institutions and information scientist is very important, which helps the readers in accessing agricultural information resources in the library. It is very important to have libraries and information centres in agricultural universities and research institutes. Libraries and information centres play an important role in

providing information related to agriculture to the people associated with the agriculture sector.

## Role of Library in Agricultural Universities

The library is playing an important role in education, research and extension activities in the Agricultural University.

- ✓ The main role of the Agricultural Library is to increase the use of agricultural resources in agricultural education, research and extension services.
- ✓ Providing latest information services to agricultural scientists, researchers, professors, students, farmers and people involved in agriculture
- ✓ Assistance for improving the quality of education, research and extension services of agricultural institutions.
- ✓ Increasing cooperation with other agricultural resources to access information resources.
- ✓ Organizing awareness programs for farmers in rural areas by Agriculture Library, exhibition of latest agricultural research, publications related to agriculture

## Roles and responsibilities of a librarian

- ✓ To assist students, researchers and other users in the search of information related to agricultural science in the library.
- ✓ To aware of the information sources of agricultural science and related subjects.
- ✓ To fulfil the information needs of the users from the various information sources available in the library.
- ✓ To prepare bibliographies of the latest information sources available in agriculture and related subjects.
- ✓ To promote the development work of the library.
- ✓ To performing various functions related to information service.
- ✓ To creating and disseminating of research related information in agriculture science and related subject.
- ✓ To acquaint the students and research scholars with the modern technology used in the library

- ✓ To help library users access information from online information sources.
- ✓ To help library users to access information from Internet, search engine, databases and CD ROMs
- ✓ To organizing daily work and other services in the library.

## Suggestions for effective use of library in Agricultural University

Agricultural libraries should encourage and assist in agricultural education, training, extension, and research. Libraries should be used as a resource for advanced study.

- ✓ The library in agricultural university should promote agricultural teaching, training, extension and research activities. The library should act as an advanced learning centre.
- ✓ Library services must be accessible to users at all times 24*7.
- ✓ Computerization should be given importance in the library and all the works in the library should be automated.
- ✓ Agriculture library should organize orientation programmes, lectures etc related to user awareness.
- ✓ Regular awareness and training should be necessary for the library staff of agricultural libraries.
- ✓ RFID should be used for exchange of books in the agricultural library.
- ✓ Agricultural libraries should provide weather and disease prevention information for the farming community.
- ✓ Feedback should also be given more attention after providing information to the users of agricultural library.
- ✓ Mobile app should be developed for library services.
- ✓ Modern equipments like computer, mobile, laptop, etc. Should be Use for library services
- ✓ Proper Drinking Water, Proper Cooling, Proper Display /arrangement of library resources and Cleanliness, Pleasant Environment might attract users towards agricultural library.

Librarian should be Familiar with e-Krishisiksha, Krishikosh, KIOSK, Consortium for e-Resources in Agriculture, AgriCat and other latest information technique of agriculture.

## Conclusion

The importance of a librarian is rarely underestimated. The function of the librarian has evolved in response to changing user requirements and technological advancements. We must adapt to changing circumstances, be conscious of ourselves and our readers. It's important to remember that we're service providers, and we're here to help. People who work in libraries and information should enhance their skills and step forward to assist users in this age of knowledge and technology. This necessitates agricultural librarians becoming more proactive in their efforts to improve their ability to use technology effectively and efficiently. If attention is paid to the use of technology in the agricultural library, then there will be prosperity in the field of agriculture. In the age of information technology, the people associated with the library and information should upgrade themselves with their capabilities. Librarians need to increase their skill level and be more proactive for using technology.

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# THEME 9

# Plagiarism, IPR & Library Management

# Plagiarism in Scientific Writing

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**Abstract:**

*Plagiarism is getting increasingly common across all industries. Plagiarism is a serious problem that the majority of writers are unaware of. Plagiarism can range from basic deception to a more serious issue where authors cut-copy-paste from the original material without correctly acknowledging the main source. When we use databases such as LISA/Google Scholar/MedLine/Pubmed, we find a wealth of material on plagiarism. Knowing how to avoid plagiarism, on the other hand, remains a matter of interest for all researchers. It is now the responsibility of every young researcher to be aware of ethical standards when writing scientific articles. If we apply our own ideas, we can write the paper totally without consulting the original source.*

## Introduction:

Plagiarism comes from the Latin word “plagium”, which means "to kidnap a man." It's a literary term for stealing someone else's work and presenting it as their own.(7)

Plagiarism is the theft of intellectual or literary property (intentional or unintentional). Plagiarism occurs when someone, without their permission, uses another person's language, ideas, or any other type of text, figure, or graph that is not part of common original knowledge.

“According to the Merriam-Webster online dictionary, to "plagiarize" means:

• “to steal and pass off (the ideas or words of another) as one's own”

• “to use (another's production) without crediting the source”

• “to commit literary theft”

• “to present as new and original an idea or product derived from an existing source” (8)

Understanding plagiarism, its varieties, and the consequences of plagiarism is critical for students, teachers, and academicians. Plagiarism has always existed, but students now have a greater number of techniques to plagiarise without being caught. It is now quite simple allowing a student to just take material and use it in part or in its entirety in their own work that is something we must acknowledge. plagiarism is not tolerated in academic writing, and that stealing someone else's work is a criminal offence. It's also important to realise that plagiarism has major ramifications. If you are a faculty member, you may be fired or demoted from your position, you will also be barred from supervising PhD students. Furthermore, if you are a student, it is possible that your registration as a PhD student will be revoked. (4)

Researchers and authors of academic papers must adhere to Good Scientific Practice guidelines. Honesty and integrity are two principles that should be followed. In today's collaborative world, in addition to trans-disciplinary research every author's honesty is important becoming a pillar of science that can be trusted (3)

## Reasons for Plagiarism:

There are a variety of reasons why a teacher or a student plagiarises. A teacher may plagiarise in order to get an unfair advantage in publishing/writing projects/books, for example. However, there are a variety of reasons why a student plagiarises. Let's look at why a student plagiarises in their writing.

### Study Pressure

This is one of the reasons why students plagiarise in academic work. Students are busy with a number of duties, including assignments, presentations, and term end examinations, in addition to needing to write their synopsis/papers, thus it's conceivable that this is one of the reasons they find cutting, copying, and pasting so straightforward. (4)

### Disorganized

When you're unorganised, you're constantly thinking about what you should do, what you shouldn't do, and what you should do first. What I'm going to do after that... In the meanwhile, you might just copy from the internet or another source.(4)

**Poor Study Habits**

When students are uninterested in their research or job. They just shrug it off and try to find any easy method to finish their project or whatever work they've been given. (4)

**English as a foreign language**

Students who are not native English speakers may find it difficult to write in English. (4)

**Lack of strict academic discipline**

Students and even teachers are frequently unaware of the consequences of plagiarism due to a lack of awareness of the implications. It may result in plagiarism in rare cases. (4)

## Types of Plagiarism:

Plagiarism can be classified in four different ways.

**Direct Plagiarism:-**When a paragraph is copied word for word without quote marks or attribution, this is known as direct plagiarism. That is, passing it off as his or her own work, in whole or in part, without acknowledgement constitutes direct plagiarism. Plagiarism is unethical and academic misconduct, and it can lead to disciplinary action if found. The consequences of plagiarism can be quite hazardous.

**Mosaic Plagiarism (Patch writing):-**Mosaic Plagiarism is defined as stealing terms from any source without putting quote marks around them, or attempting to find synonyms for the author's language while keeping the text's fundamental meaning intact. Patch writing is another name for it. Whether done intentionally or unwittingly, this form of paraphrasing is considered academic misconduct. Even if you cite your source in the footnotes, it's still unlawful.

**Self-Plagiarism:-**Self-plagiarism occurs when a student reuses or combines elements of his or her own earlier work without the permission of all co-authors involved.

Self-plagiarism, for example, occurs when you incorporate a portion of a paper written at the graduate level into a paper you will write after graduation. Self-plagiarism is when you take advantage of one piece of work over and over again... It's the equivalent of utilising one research paper for two degrees, or not being able to copy figures, tables, or text from a previous publication into a new manuscript.

In theory, you must obtain permission before repeating the content.... otherwise; it will be considered self-plagiarism.

**Accidental Plagiarism:-**When you're working on a piece of literature, you may inadvertently plagiarise. You simply fail to cite your sources, misquote them, or mistakenly paraphrase them by using comparable words or groupings of words without attribution. Students should learn how to reference and keep meticulous records of the sources they've used (should develop note taking hobbit). It indicates that you should be meticulous in recording down even the smallest details. For example, if you have taken a few lines from a book and the book is misplaced, there may be an issue with referring, which you might have prevented if you had written the book's reference beforehand.(4)

## UGC about Plagiarism:

Regulations of the University Grants Commission (Promotion of Academic Integrity and Plagiarism Prevention in Higher Educational Institutions), 2018. These rules will apply to all students, instructors, researchers, and employees of the country's higher education institutions. These regulations become effective on the 23rd of July, 2018, when they were published in the Official Gazette.

In this regulation it has given definitions to some technical words as follows:

"Plagiarism" means the practice of taking someone else's work or idea and passing them as one's own;

"Academic Integrity" refers to the intellectual honesty with which one proposes, performs, and reports any action that results in intellectual property production.

"Author" A student, faculty member, researcher, or staff member of a Higher Educational Institution (HEI) who claims to be the inventor of the work under review is referred to as a "author."

"Information" Data, message, text, images, sound, voice, codes, computer programmes, software, and databases, as well as microfilm or computer generated microfiche;

"Researcher" refers to a person who conducts academic or scientific research in higher education institutions;

"Staff" refers to all non-teaching employees who work in higher education institutions in whatever capacity, including regular, temporary, contract, outsourced, and so on.;

"Student" denotes a student who has been accepted and is enrolled in a programme of study, including a research programme, in any form of study (full time or part-time or distance mode) ;(5)

## UGC Guidelins for Curbing Plagiarism in HEI (Higher Education Institutions):

When theses, dissertations, publications, and other comparable materials are submitted, HEI must declare and implement a technology-based strategy that uses relevant instruments to ensure that they are free of plagiarism.

The technique mentioned above must be available to all study participants, including students, academics, researchers, and staff.

Every student who submits a thesis, dissertation, or other similar paper to the HEI must sign an undertaking stating that the document was written by him or her, that it is his or her original work, and that it is free of plagiarism.

The assurance must state that the document has been thoroughly examined using a Plagiarism Detection Tool that has been approved by the HEI.

The HEI will draught a plagiarism policy and get it authorised by the appropriate legislative bodies/authorities. The approved policy must be posted on the HEI website's homepage.

Each supervisor must submit a certificate stating that the work completed by the researcher under his or her supervision is free of plagiarism.

HEI will deliver soft copies of all Masters, Research programme dissertations, and thesis to INFLIBNET for hosting in the digital repository under the "Shodh Ganga e-repository" within a month of the award of degrees.

On the institute website, HEI will build an Institutional Repository that will store dissertations, theses, papers, publications, and other in-house publications.(5)

## UGC Guidelines on Penalties:

Only after academic misconduct on the part of the individual has been proven beyond a reasonable doubt, after all avenues of appeal have been exhausted, and the individual in question has been given a fair and transparent opportunity to defend himself or herself, will penalties for plagiarism be imposed on students pursuing Masters and Research programmes, as well as researchers, faculty, and staff of the HEI. In case of plagiarism in academic and research publications

I. Level 0: Similarities up to 10% - Minor similarities, no penalty.

II. Level 1: Similarities above 10% to 40%

i) Shall be asked to withdraw manuscript.

III. Level 2: Similarities above 40% to 60%

i) Shall be asked to withdraw manuscript.

ii) Shall be denied a right to one annual increment.

iii) Shall not be allowed to be a supervisor to any new Master's, M.Phil., Ph.D. Student/scholar for a period of two years.

IV. Level 3: Similarities above 60%

i) Shall be asked to withdraw manuscript.

ii) Shall be denied a right to two successive annual increments.

iii) Shall not be allowed to be a supervisor to any new Master's, M.Phil., Ph.D. Student/scholar for a period of three years.

UGC also has given another set of rules of penalties in case of plagiarism in submission of thesis and dissertations

Level 0: Similarities up to 10% - Minor Similarities, no penalty.

ii. Level 1: Similarities above 10% to 40% - Such student shall be asked to submit a revised script within a stipulated time period not exceeding 6 months.

iii. Level 2: Similarities above 40% to 60% - Such student shall be debarred from submitting a revised script for a period of one year.

iv. Level 3: Similarities above 60% -Such student registration for that programme shall be cancelled.

Similarity checks for exclusion from Plagiarism

The research work done by students, instructors, researchers, and staff must be original, with abstracts, summaries, hypotheses, observations, results, conclusions, and recommendations being the only things that are comparable. It must not contain any common knowledge or coincidental terms for a period of up to fourteen (14) words. The UGC also suggest to exclude the following text while running the plagiarism

i. All quoted work reproduced with all necessary permission and/or attribution.

ii. All references, bibliography, table of content, preface and acknowledgements.

iii. All generic terms, laws, standard symbols and standards equations.(5)

**Plagiarism and its consequences:**

**Academic Penalties**-Students that submit plagiarised work may face severe consequences, as previously indicated. Grade penalties, failure in a class or course, suspension, expulsion, or other disciplinary consequences, such as being excluded from extracurricular activities or sports, are all options. In some cases, students may be barred from attending other institutions or universities..

**Loss of Creativity**-Your creativity will suffer as a result of not pushing ourselves to develop unique content and new ideas. It's difficult to train your creative muscles when you're simply copying someone else's work. To make their work stand out, the finest writers push themselves to be more creative. Plagiarism prevents you from attempting to create something truly unique.

**Damage to Reputation**-Plagiarism can harm your personal and professional reputation in addition to harming your job. You may potentially endanger the brand you represent or your employer's reputation.

**Dishearten the Followers/Audience**- Followers of your work (students, staff) etc. feel dishearten of you plagiarized work and you lose your credibility among them.

**Legal and Criminal Action**: Finally, one of the most serious consequences of plagiarism is the risk of being sued or perhaps going to prison. Although most plagiarism matters are resolved without going to court, if the plagiarised content is protected by copyright law, you may be subject to legal fines or penalties. At the very least, you could be served with a cease and desist notice. (6)

**Plagiarism Consequences Case Study-**

A doctoral thesis rejected on charge of Plagiarism" (20 May, 2012)

"The University of Madras has rejected a research scholar's doctoral thesis on charges of plagiarism and has banned the student from re-registering for the degree at the university".

A former university vice chancellor has been accused of plagiarism" (February 25, 2015)

"Former Delhi University vice chancellor Deepak Pental was arrested and sent to Tihar jail on Tuesday after a fellow professor complained of plagiarism and

illegally using a chemical substance from the university's science lab. Professor P Parthasarthy, had accused Pental of plagiarizing his paper on biotechnology".(4)

**How to avoid Plagiarism in Scientific Publications:**

Plagiarism is when you purposefully or inadvertently pass off someone else's work as your own. This could include plagiarising or paraphrasing someone else's published or unpublished work without attribution, or misrepresenting someone else's artistic or technical work or production as your own.

Every HEI should implement the mechanism in order to raise awareness about responsible behaviour. Conducting research and academic activities in order to maintain academic integrity and avoid plagiarism.

HEI will teach students, teachers, researchers, and staff on correct attribution, obtaining author permission where necessary, and acknowledging sources in accordance with the needs and specificities of disciplines, as well as rules, international agreements, and regulations that regulate the source.

Every semester, HEI will hold seminars/awareness programmes for students, instructors, researchers, and staff on responsible research, thesis, and dissertation writing, as well as the promotion of academic integrity and ethics in education.

i. Include the cardinal principles of academic integrity as a required course work/module in the curriculum of undergraduate (UG), postgraduate (PG), and master's degree programmes, among others.

ii. Make components of responsible research conduct and publication ethics a required course. Master's and Research Scholars' work/module.

iii. Incorporate components of responsible research conduct and publication ethics into Orientation and Instruction.

iv. The HEI should organise refresher courses for its academics and personnel.

v. Educate students, instructors, researchers, and staff on how to use plagiarism detection software and reference management tools.

vi. Create a facility that is equipped with cutting-edge plagiarism detecting technology.

vii. Encourage students, academics, researchers, and staff to join the International Registry of Researchers. (5)

## Conclusion:

We must do more than preach about the advantages of academic integrity and condemn the immorality of taking other people's ideas to effectively combat plagiarism. We must concentrate our efforts on forming communities of practice that value creative and reflective writing. Students must participate in instruction that explains the origins and significance of intellectual honesty. Because of the current emphasis on testing and grades, instructors and students have lost sight of the more fundamental aims of education, such as lifelong learning and national and global citizenship. Students can be persuaded that plagiarism and other forms of academic dishonesty are not in their long-term best interests by refocusing on higher-order goals. Monitoring, promotion, and research development divisions should be developed in scientific and academic institutions. Plagiarism should not be excluded from exposure and consequences in science.

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# A Study of Awareness, Attitude and Perceptiontowards Plagiarism among Post Graduate Scholars of Chaudhary Ranbir Singh University, Jind, Haryana (India)

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## Abstract

**Objective:** To examine the level of awareness, attitude and perception among PG students on various issues of Plagiarism at Chaudhary Ranbir Singh University, Jind, Haryana, (Haryana)

**Methods:**A well structured questionnaire was designed to collect the data from the Post Graduate (PG) students as well as interviews were conducted with the students and analyses were made with the support of literature.

**Results:** After analyzing the responses of the respondents, it has been observed that 60.66% (91) respondents in view of that they commit the plagiarism as and when they have the pressure to submit the assignments in stipulated time period. The findings also revealed that respondents have the negative attitudes with few aspects of plagiarism. Therefore, after undergoing the study results, the authors suggested few considerable suggestions in order to curb and aware the students towards plagiarism.

**Conclusions:**majority of the students were not aware of the University Grants Commission Regulation 2018 on plagiarism. The students feel that plagiarism policy should be published in students' handbooks, university policies documents and university websites and it should be well oriented through organized information literacy programs organized in the university.

**Keywords:**Plagiarism, Awareness, Attitude, Perception, Academic Dishonesty, Crime, and PG students.

## 1. Introduction

In academic societies, the plagiarism is considered as crime against academic integrity or violation of copyright law and Intellectual property rights. The plagiarism is prevailing since inception not only in India even world education. However, due to easy accessibility of digital contents, the cases of plagiarism are noticed more especially in last two decades. Therefore, to know the reason why students are being committed the plagiarism and to know level of awareness among them along with to study the attitude and perception of students towards plagiarism, the same study has been conducted in Chaudhary Ranbir Singh University, Jind, Haryana-India with Post Graduate students. For the purpose, a structured questionnaire was prepared and distributed randomly among Post Graduate (PG) students to collect the data. The major finding of the study is that majority of the respondents have less aware about the plagiarism, but they are in the opinions that Plagiarism is a crime in academics. After analyzing the responses of the respondents, it has been observed that 60.66% (91) respondents in view of that they commit the plagiarism as and when they have the pressure to submit the assignments in stipulated time period. The findings also revealed that respondents have the negative attitudes with few aspects of plagiarism. Therefore, after undergoing the study results, the authors suggested few considerable suggestions in order to curb and aware the students towards plagiarism.

Plagiarism has created the pandemonium situation infront of the 21$^{st}$Education Systems all over the world. India has also not left from the same. Syllabi and study contents are easily available and accessible through web even no issue of distance, size and physical format of the concerned documents. All these changing have become possible due to emergence of Information and Communication Technology in academic activities like class room teaching, publishing the text, information retrieval and dissemination and many more. Even Government of India has taken the initiative and launched a program in 2009 namely National Mission of Education through Information and Communication technology- NME-ICT. This

technology has changed the orientation of the education and information seeking behavior of the modern users. Before Google, things were so easy as for teaching teachers and students supposed to physically present in the class room and now-a-days many academic institutions have designed online courses and providing through online mode along with e-content and full text e-resources. However, students feel that whatever materials they have downloaded from web, they can use the same in their study and research and can publish by own name. Here the issue of plagiarism penetrates the system.

Plagiarism is an act of misconduct of research work, use of someone's ideas, information and it also involves the stealing of intellectual property of another's one without giving the credits to original author of the information, text or idea. Plagiarism is not a new term in academia, but it exists from centuries. The word Plagiarism derived from Latin word 'plagiarius' and stand for kidnapping, seducing and plundering. Higher education institutes are meant to generate new idea/s, theory/s, formula/s and standard/s through experimental research, field work, research project/s, assignment/s, and other research methods and efforts to produce highly skilled professionals and proficient graduates and postgraduate students with a high standard of commitment, ethics, professionalism and honesty for the betterment of the community.

## Definitions of Plagiarism

Plagiarism has been defined differently by different authors.

University Grants Commission (UGC), India defined "plagiarism as 'Plagiarism' means the practice of taking someone else's work or idea and passing them as one's own".

European Code of Conduct for Research Integrity (2017) defined Plagiarism as "Plagiarism is using other people's work and ideas without giving proper credit to the original source, thus violating the rights of the original author(s) to their intellectual outputs."

The Committee on Publication ethics (COPE), United Kingdom has given the definition on Plagiarism as "Plagiarism ranges from the unreferenced use of others' published and unpublished ideas, including research grant applications to submission under 'new' authorship of a complete paper, sometimes in a different language. It may occur at any stage of planning, research, writing, or publication: it applies to print and electronic versions."

"Unacknowledged coping of documents or programs" (Joy & Luck, 1999,pp 129-133)

"The submission of part or all of another person's work as if it were one own, without the knowledge of the author, and with intention to deceive" (Irving, 2004)

## Chaudhary Ranbir Singh University, Jind

"Chaudhary Ranbir Singh University was established by the State Legislature Act 28 of 2014 on July 24, 2014 at Jind, Haryana. The main vision of university is to imparting quality education by creating most conducive ambience for the production and dissemination of knowledge guided by innovative thinking, scientific enquiry, sublime human values, sustainable ecology, and democratic ethos. It has running 16 teaching departments. Chaudhary Ranbir Singh University is actively engaged in collaborative research with various institutions at national level and supports excellence and innovation in academic programs, promotes excellence in teaching, research and scholarships. The Central Library of the University is well equipped with modern facilities and resource (print and online) as per the requirements of users."

## 2. Research Methodology

A well structured questionnaire was designed to collect the data from the Post Graduate (PG) students as well as interviews were conducted with the students and analyses were made with the support of literature. A total of 200 questionnaires were randomly distributedamong PG students and out of 200 questionnaires, 150 questionnaires were received back. The data were analyzed with the help of excel and presented in the form of tables, figures and graph using percentage (%)**.**

## Description of the Instrument

To assess the perception, awareness and attitude of students towards plagiarisma self made questionnaire was used. This questionnaire was prepared by the investigator with the help of related literature, supervisor and experts. This questionnaire comprises three sections A, B and C. Section A consisted eight questions related to perception towards plagiarism. Each question has four options as Strongly Agree, Agree, Disagree and Strongly Disagree.Further in Section B,ten questions were written to assess the awareness level towards plagiarism. In this section, every question has two options i.e."Yes"or"No". Section C questions inserted to assess the attitude towards plagiarism. This section has contained fifteen

questions where each question has five options to answer. These options are Strongly Agree, Agree, Undecided, Strongly Disagree and Disagree.

**Instructions for Administration**

1. No time limit is fixed for completing the test. However, usually an individual takes nearly 30 to 40 minutes in completing the questionnaire.
2. It should be emphasized that there is no right or wrong response to the statements. They are designed to study individual's reactions to different facets.
3. It should be pointed out that each items has to be responded in the form of a symbol of right (√) in the blank space given below or in front of options and that no statement should be left out.
4. The aim of test was cleared to each respondent.

**Interpretation of Responses**

While interpreting the responses of Section A and Section C i.e. "strongly agree" and "agree" responses have merged into "Agree" and similarly "strongly disagree" and "disagree" responses have merged into "Disagree".

**Interpretations of Responses**

| Section | Response | Interpretation |
|---|---|---|
| Section A | Agree<br>Disagree | Positive Perception<br>Negative Perception |
| Section B | Yes<br>No | High Level of Awareness<br>Negligible Level of Awareness |
| Section C | Agree<br>Undecided<br>Disagree | Positive Attitude<br>Neutral Attitude<br>Negative Attitude |

**Objectives of the Study**

1. To examine the level of awareness among PG students on various issues of Plagiarism.
2. To know the attitude of students towards plagiarism.
3. To study the perception among students towards plagiarism.

## Research Questions?

4. What is the level of awareness among PG students at Chaudhary Ranbir Singh University, Jind (Haryana)?
5. What is the attitude of PG students towards Plagiarism Chaudhary Ranbir Singh University, Jind (Haryana)?
6. What is the perception of PG students towards Plagiarism at Chaudhary Ranbir Singh University, Jind (Haryana)?

## 3. Results of the Study

Data Analysis& Interpretation

**Table 1 below indicated the awareness of Plagiarism among PG students:**

| Statement | Aware | Not Aware |
|---|---|---|
| If you write others work as your own, then it is Plagiarism | 65 (43.33%) | 85 (56.67%) |
| Writing words or ideas from others written matter without giving credit to him/her is plagiarism | 58 (38.67%) | 92 (61.33%) |
| Have you heard the word Plagiarism before this questionnaire | 123 (82%) | 27 (18%) |
| Writing wrong information about the source of a quotation is plagiarism | 32 (21.33%) | 118 (78.67%) |
| Writing the words differently but copying the sentence structure of a source without giving credit to that source is plagiarism | 03 (2%) | 147 (98%) |
| If majority of your work is copied from a source, whether you give credit or not to that source is plagiarism | 08 (5.33%) | 142 (94.67%) |
| The UGC insisting on universities to use antiplagiarism software for checking plagiarism in thesis at Post Graduate and Higher Research Degree Level like M.phil.& Ph.D. | 17 (11.33%) | 133 (88.67%) |
| Analyse the statements regarding the Consequence of plagiarism | | |
| (a) If anyone caught in plagiarism he/she will be punished | 14 (9.33%) | 136(90.67%) |
| (b) Plagiarism can spoil the career of any one | 02 (1.33%) | 148(98.67%) |
| (c) Self plagiarism is also punishable | 13 (8.66%) | 137(91.33%) |
| (d) A person can lose his/her job due to indulging in plagiarism | 3 (2%) | 147(98%) |
| (e) A person can be sent to jail due to indulging in plagiarism | 2 (1.33%) | 148(98.67%) |

| | | |
|---|---|---|
| Turnitin is the tool/Software to measure the plagiarism. | 109 (72.67%) | 41 (27.33%) |
| Analyse and answer each statement regarding the type of plagiarism | | |
| (a) Self plagiarism is a plagiarism | 15 (10%) | 135 (90%) |
| (b) Direct plagiarism is a plagiarism | 15 (10%) | 135 (90%) |
| (c) Unintentional plagiarism is a plagiarism | 13 (8.66%) | 137(91.33%) |

**Table 1: Awareness of Plagiarism among PG students**

Table 1 clearly indicates that PG students' heard about the plagiarism but concept is not cleared so much. Moreover, majority of the students do not aware about the existence of notification of University Grants Commission-UGC on Plagiarism published in 2018 Gazette of India. The results of the table also shows that most of the PG students are unaware about the types of plagiarism and punishment also, if they caught under plagiarism act even not aware about the levels which have been defined for similarity in the same notification.

## Perception towards Plagiarism among PG students

| Sr. No. | Statement | Strongly Agree | Agree | Disagree | Strongly Disagree |
|---|---|---|---|---|---|
| 1 | Plagiarism is a crime in academics | 37 (25%) | 78 (52%) | 35 (23%) | |
| 2 | Plagiarism is an act of lack of honesty and integrity | 40(27%) | 83(55%) | 27(18%) | - |
| 3 | Plagiarism is an act done because of Laziness | 14(9.33 %) | 87(58%) | 48(32%) | 1(0.67%) |
| 4 | There is nothing wrong in doing plagiarism | 0 | 4(2.67% ) | 93(62%) | 53(35.33 %) |
| 5 | Plagiarism shows your smartness | 0 | 7(4.66% ) | 85 (56.66%) | 58(38.67 %) |
| 6 | Everyone is doing plagiarism , so it is not wrong | | 18(12%) | 85(56.66%) | 47(31.33) |
| 7 | Plagiarism does not affect the morals | 2 (1.33%) | 3(2%) | 113(75.33 %) | 32(21.34 %) |

**Table 2: Perception towards Plagiarism among PG students**

Table 2 presented the resultsof PG students' perception towards plagiarism at Chaudhary Ranbir Singh University, Jind. For easiness of results, agree and strongly agree responses have considered under agree and similarly strongly disagree and disagree responses have considered under disagree. Findings of the results revealed that maximum respondents having the perception that plagiarism is not good thing for the academic and research as it destroys the reputation of the institution also.Further, table also showed that115(75%) of the respondents expressed that plagiarism is an academic crime, 123 (82%) agreed that plagiarism is an act that shows lack of honesty & integrity, 145 (96.67%) concurred that plagiarism affect the morals and 101 (67.33%) noted that plagiarism is due to laziness. Thus, the results revealed that majority of the respondents have the attitude which is in favor of fair research.

**Table 3: Attitude towards Plagiarism among PG students**

| Sr. No. | Statement | Strongly Agree | Agree | Undecided | Strongly Disagree | Disa gree |
|---|---|---|---|---|---|---|
| 1 | Most of students and research scholars copy other's work; I am also following the same. | | 138 | 8 | 0 | 4 |
| 2 | Plagiarism is the need due to work pressure. | 1 | 7 | 6 | 23 | 113 |
| 3 | Plagiarism is necessary if there is a deadline to submit a assignment/paper/thesis. | 2 | 89 | 24 | 13 | 22 |
| 4 | Plagiarism is justified if some portion of the paper is plagiarized from a quality journal article since it has scientific value. | 3 | 97 | 33 | 7 | 10 |
| 5 | Plagiarism is necessary due to engaging in important work. | 1 | 5 | 6 | 98 | 40 |
| 6 | Copying methodology from other thesis is justifiable because the methodology always remains same. | 2 | 67 | 59 | 12 | 10 |

| | | | | | | |
|---|---|---|---|---|---|---|
| 7 | If anyone plagiarise one's own data, it is not punishable because it is not Harmful. | 3 | 98 | 3 | 8 | 38 |
| 8 | Without copying other's work nobody can write a thesis. | | 19 | | 17 | 114 |
| 9 | No one checks and detect the copied material. | | 2 | 8 | 27 | 113 |
| 10 | Copying and pasting from the Internet is easier than writing own sentences | 2 | 102 | 15 | 3 | 28 |
| 11 | New coming students or researchers should receive a relaxation for punishment regarding plagiarism | 97 | 45 | 6 | 0 | 2 |
| 12 | Plagiarism is not a very bad act | | 2 | 13 | 20 | 115 |
| 13 | If any of my colleague permits me to copy from his/her paper. I am not doing anything wrong | | 76 | 13 | 6 | 55 |
| 14 | The name of the writer who plagiarize in his/her paper or thesis should not be disclosed to the academic community | 2 | 121 | 10 | 5 | 12 |
| 15 | Sometimes it is difficult to avoid using other people's words without citing them | 2 | 127 | 11 | 2 | 8 |

Table 3 depictsthe results on PG students'attitude towards plagiarism. Again for cumulative results agree and strongly agree responses have considered under agree and likewise strongly disagree and disagree have kept under disagree. Findings depict that majority of the respondents agreed that this is pandemic in the academics and they have agreed that they are not aware its enery ins and outs. Moreover, table also shown 91 (60.66%) of respondents expressed that they committed the plagiarism when they received a deadline from professor to submit

an assignment. It has also observed that with few aspects of plagiarism, the respondents' out rightly refused.

## 4. Discussion &Conclusion

The main aim of present study was to examine the level of awareness, attitude and perception of PG students to determine the existence of plagiarism policy, plagiarism detection tools and effectiveness of the faculty members at Chaudhary Ranbir Singh University, Jind Haryana. It was discouraging that majority of the students were not aware of the University Grants Commission Regulation 2018 on plagiarism. The students feel that plagiarism policy should be published in students' handbooks, university policies documents and university websites and it should be well oriented through organized information literacy programs organized in the university. It is strongly recommended that the workshop, seminars and symposia may be conducted to educate the students and research scholars about plagiarism, UGC policy on plagiarism, techniques, to avoid plagiarism and fair publishing.

## Recommendations

In light of the current study, the following recommendations may be proposed for further betterments:

1. Conducting workshops to develop skills in writing the citations style in a standard format.
2. A separate instruction module related to plagiarism and academic dishonesty, should be included in the curriculum at undergraduate level as well as Post Graduate level so that depth learning opportunity to identify what plagiarism is and its consequences, if caught to the students at early stage to control over this serious academic dishonesty and misconduct.

## Future area for further study

As we know that research scholars and teaching community play an important role in controlling and cheating of plagiarism in a research institutes. Due to the limited resources, this study is limited only to research scholars and teachers of this university only. The similar study may be conducted to investigate the awareness, attitude and perception level of the research scholars of more than two academic universities and National Institute of Technology.

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# Intellectual Property Rights issues among Academia: An Overview

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## Abstract

*One of the main responsibilities of an Educational institution is to instruct its academic community about Intellectual Property Rights issues particularly on copyright and plagiarism. Because these two issues can probably make academic communities to involve in academic misconduct resulting in low quality academic and research publications. Copyright is a legal aspect, while plagiarism is an ethical issue; however these two issues are frequently confused. Plagiarism covers a wide spectrum of misconducts; therefore an act of plagiarism isn't always comparable to copyright infringement. Plagiarism and copyright infringement particularly in the present digital environment have deep implication on scholarly communities among the academia. The present paper highlights the literary issues of Intellectual Property Rights specifically on issues such as copyright and its infringement and Plagiarism.*

**Key words:** *Intellectual Property Rights, Copyright law, Plagiarism, Higher education, Academic Integrity*.

## Introduction

The objective of intellectual property law is to find a balance between the creator's ownership and control over his or her creations and the public's right to access and use them. On the one hand, creators have the right of benefit to protect, and control the use of their works. On the other hand, the law restricts the length of that ownership and, in the case of copyright, expressly allows certain "fair use" of the material without the requirement for permission or payment to the creator. Finally, the law gives economic incentives and ownership protections to individuals who create intellectual property, but also guaranteeing that their control does not become so tight that it restricts everyone’s access or prevents the creation of new works inspired by these protected resources. Another major issue of Intellectual Property Rights is plagiarism which deals with taking someone else idea or work without acknowledging creator of the original work.(Strom, 2002, p. 1)

In the present digital environment, Intellectual Property Rights issues such as copyright infringement and plagiarism have made Higher Education Institutions to look at the consequences of these issues and implication among academic community. The impact of Information and Communication Technology (ICT) has made easy availability of electronic information to academic community which has led them to involve in violation of Intellectual Property Rights. Therefore it is very essential for researchers and academicians to have a thorough understanding of Intellectual Property Rights particularly copyright related aspects so that they can maintain academic integrity by adopting ethical behavior in the research endeavors.

## What is Intellectual Property?

Intellectual property is an intangible property of the human mind that is generally expressed or translated into a tangible form by providing some exclusive rights.

### 1. What is Intellectual Property Rights?

The rights granted to the owner of the original work over their mind's creation are known as Intellectual Property Rights. They usually grant the creator a certain amount of control over the use of his or her work for a limited period of time.

### 1.1.Types of IPR

Intellectual Property Rights are broadly categorized as two types, as discussed below

i. **Industrial property**: This includes patents, trademarks, industrial designs, and source identifiers.
ii. **Copyright and its related rights:** this encompasses artistic and literary works such as novels, poetry, and plays, as well as films, musical works, and artistic works such as drawings, paintings, pictures, and sculptures. Copyright includes performing artists' rights in their performances, phonogram makers' rights in their recordings, and broadcasters' rights in their radio and television shows. (Adukia, 2012, p. 4)

#### 1.1.1. Patents:

A patent is an intellectual property right relating to inventions that grants the patentee exclusive rights for a set period of time in exchange for full disclosure of his invention and prohibits others from making, using, selling, or importing the patented product or processes that produce it for any purpose.

### 1.1.2. Copyright

Copyright is generally known is a right of use given by the law to the creator of literary, dramatic, musical and artistic works for a specific period of time.

### 1.1.3. Trademarks:

Any symbol or combination of signs, capable of distinguishing one company's goods or services from those of other companies is defined as a trademark. Protectable subject matter is a distinct feature. The agreement states that the initial registration and each renewal must be for a minimum of seven years, with the registration being renewed indefinitely. It is not authorized to license trademarks on a forced basis. (Prabu et al., 2012)

### 1.1.4. Industrial Design

Industrial design is the creative effort that results in a product's decorative or formal appearance, and design right is the novel or original design that is granted to the owner of a valid registered design.

### 1.1.5. Geographical Indication

Geographical Indications are labels that are placed on products that have a distinct geographical origin and have traits or a reputation that are unique to that location.

### 1.1.6. Trade Secrets

A trade secret could be confidential commercial information that gives an organization a competitive advantage.

### 1.1.7. Layout design for integrated circuits

The three-dimensional arrangement, however expressed, of the elements of an integrated circuit, at least one of which is an active element, and some or all of the interconnections, or such a three-dimensional arrangement prepared for an integrated circuit intended for manufacture, is referred to as a layout-design. (Prabu et al., 2012)

1.1.8. **Protection of new plant variety**:

Novel plant variety protection is a sort of intellectual property that aims to honor plant breeders' achievements by awarding them an exclusive right for a limited time. New types must meet particular criteria to be eligible for such protection. Variety is defined as a plant grouping within a single botanical toxin of the lowest recognized rank. It is appropriate if the plant is fresh or innovative, distinct, uniform, stable, and has a reasonable designation. (Prabu et al., 2012)

## 2. Major issues of Intellectual Property Rights in Higher education:

### 2.1.Copyright Law

Copyright law, in general, grants authors exclusive rights over their "writings" or "works of authorship" for a set length of time. It protects the author of intellectual property against individuals who have access to the copyrighted work and create a similar work, a derivative work, a copy (reproduce), an electronic distribution or publication copy, or publicly perform or display a work. For any copyright infringement legal action to be taken, both access and likeness to the original work must be present. An individual must have proof that he or she had access to the original material in order to allege copyright infringement by another's work that is similar or a direct duplicate.

A significant amount of scholarly work is published in periodicals, annuals, and anthologies. Faculty who write articles that have been published in journals, newspapers, or other periodicals may register for their work separately. The copyright in a separate contribution to a published collective work is distinct from the copyright in the collective work as a whole, according to the present copyright statute. The submitted work, like other published works, may be accompanied by its own copyright notice. (Van Dusan, 2013)

### 2.2.**Fair use:**

Fair use has generally been characterized as a right granted to those who are not the copyright owner to use copyrighted material in a reasonable manner without the owner's permission. The Indian Copyright Act, 1957, XI clause 52, includes a fair use provision. Uses of the copyright work for research or private study, criticism, and review for reporting current events in connection with judicial proceedings are some of the exclusions of fair use.

### 2.3.Copyright Infringement

Another major issue of IPR is violation or infringe of copyright law. It occurs when someone uses a work protected by copyright law without permission, they are infringing on the copyright holder's exclusive rights, such as the right to reproduce, distribute, display, or perform the protected work. In this day and age, whatever you download off the internet is copyrighted. Just because there isn't a mark on it doesn't mean it isn't an original piece of work.

The illegal use of copyrighted materials in a way that violates one of the copyright owner's exclusive rights to produce or perform the copyrighted work, or to make derivatives that build on it, is known as copyright infringement. Piracy, text plagiarism, copyright infringement when using photocopying machines, and duplication of web pages are all examples of content infringement.

### 2.4.Plagiarism

Issues of plagiarism have great impact on academic community. Plagiarism is considered as ethical, moral and legal issue in educational institutions. In general, Plagiarism is a act of stealing or showing or presenting someone else idea or work as their own.

#### 2.4.1. Meaning and Definition of Plagiarism

Plagiarism comes from the Latin word plagium, which means "to kidnap a man." It literally means "stealing," as in "taking stuff written by others and presenting it as if it were written by someone else."
Plagiarism is defined as "the use of others' published and unpublished ideas or phrases (or other intellectual property) without acknowledgement or permission and presenting them as new and unique rather than obtained from an existing source," according to WAME (World Association of Medical Editors).

#### 2.4.2. Types of Plagiarism

- **Copy and Paste:**

Presently this kind of plagiarism is easily identified and extensively accepted as plagiarism. In this plagiarism one can find the source and incorporate by doing slight alterations through adding synonyms etc into the text to change the originality of the source author.

- **Disguised Plagiarism:**

When text from a source is copied and then some effort is made to disguise the copy, this is known as disguised plagiarism. Words may be added or removed, the word order may be altered, or a paraphrasing attempt may be made. Plagiarism is still regarded when the source is not provided, or is only given for a portion of the material taken.

- **Plagiarism by Translation:**

This kind of plagiarism happens when someone has taken a text from another language and translated through manually or through some mechanical/ artificial translation process without giving credit to the original source.

- **Structural Plagiarism**

Taking someone's idea, sequence of arguments, and selection of quotations from other people, or even the footnotes they use in the same order without giving credit

is considered structural plagiarism. This sort of plagiarism is difficult to detect because it necessitates a thorough review of both texts in order to determine what was copied.

- **Mosaic Plagiarism:**

Patchwork paraphrasing is the process of collecting content from various sources on the same interested topic and rephrasing phrases, switching words and doing some grammatical exercise through adding similar/ synonyms etc to present one's own work without acknowledging the original work.

- **Metaphor Plagiarism:**

Metaphors are used to clarify an idea or to provide readers with an analogy that speaks to their senses or emotions more effectively than a plain description of an object or process. As a result, metaphors play a vital role in an author's creative approach.

- **Idea Plagiarism:**

When someone tried to copies an innovative idea or a new solution provided by original author in a source document which is not able to give a solution or a thought of his own then it is called idea plagiarism. It is difficult of differentiate between the creator of the source document and/or solution and public domain information. (Naik et al., 2015, p. 16-17)

## 3. Major factors responsible for plagiarism and copyright infringement in higher education

In higher education institutions most of the academic community engaged in submission of assignments, research articles, research thesis and dissertations etc to get qualifications or degree and also to get reputation. Sometimes academic community knowingly or unknowingly involve in act of plagiarism due to many reasons. Let discuss reasons for plagiarism among academic community

a) Lack of understanding of the concept of copyright and plagiarism
b) Easy download from websites facilitate violation of copyright and plagiarism
c) Study pressure among students and researchers
d) Poor reading habits among academic community
e) Poor time management and laziness among academic community
f) Heavy workload
g) Limited time to submit academic and research works
h) Cut-and- paste habits among academic community
i) Lack of guidance to reduce issues of copyright and plagiarism
j) Lack of proper skills to write academic and research papers
k) Lack of knowledge of referencing; quoting; citation.

l) High cost of textbooks
m) Unavailability of information sources in libraries of academic institutions
n) Genuine lack of understanding the internet right and wrong and ignorance of copyright laws on internet contents
o) Poor time management

## 4. Ways to avoid infringement of Intellectual Property Rights in higher education

1) **Knowledge about Copyright law:** It is essential to have in-depth knowledge about what copyright law constitute. One should able to distinguish between copying and plagiarism and also one should get permission while they writing their research papers. One should able to examine what copyright does not cover. As a result, if you wish to properly protect your work, you'll need to know the law.

2) **Creativity:** One must be innovative to ensure that he/she is not generating something that is currently available on the internet. While the underlying concept isn't protected by copyright, fictional characters, plots, and other elements are. As a result, the creative light bulb must shine brightest.

3) **Know the difference between various Intellectual Properties:** There are valid distinctions between copyright, trademark, and patent. Copyright protects your original work, whereas a trademark gives you exclusive rights to a logo, symbol, or name, and a patent stops others from creating or selling an invention. As a result, while dealing with copyright issues, having a thorough understanding of the many types of intellectual property is essential

4) **Attend Seminar/ Conference/ Workshop regarding Copyright and plagiarism:** By attending brainstorming activities such as seminars/ workshops/ conferences on copyright and plagiarism will help to produce quality research and maintain academic integrity.

## 5. Conclusion

Academic institutions are generators and distributers of information through their research and academic activities. It is most important to make sure that they are attentive in protecting their copyrights from being misused by others and also make sure that they do not infringe other's copyrights. At present there are many issues and concerns related to academic integrity, publication misconduct and plagiarism which are becoming rampant among the academic community, resulting in low

quality publications. Many times students, research scholars and faculty members unknowingly involve in the activities of academic misconduct, due to lack of awareness of the existing guidelines for research and publication. Therefore, it is very essential to enhance awareness regarding Intellectual Property Rights and related issues among academic community by organizing the courses and programs as discussed in this paper so that the members of the academic community exhibit responsible conduct in their research and publication endivours.

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# Collection Development in Dr. BR. Ambedkar Central Library University College of Engineering Autonomous JNTUK Kakinada: A Study

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## 1. Introduction

Collection development is the continuing process by which library faculty provide organized collections and access to resources that will meet the instructional requirements as well as the cultural and recreational needs of the Academic community. The Dr B R Ambedkar central Library provides leadership and support for the needs of the Academic community through its collections facilities and services

The mission and goals of any library revolves around meeting the informational, educational, or recreational needs of its clientele. Knowledge of the service community whether a geographical area, or an organization, is the first key stone for effective collection development and management. The more information professionals know about the work roles, general interests, education, information and communication behavior, values of potential library users, the more likely it is that collection will be able to provide necessary information when it is needed (Gregory, 2011). Biblarz et al. (2001)[1] describe users' needs assessment as a "process of using one or more techniques to collect and analyze data regarding library users or potential users.

Collection development[2] is a vital element in any library programme and it affects the ability of a library to a great extent to meet the demands of the users. The amount of satisfaction a reader gets in a library depends directly upon the kind of books and other reading material which is available for use. Moreover, the functions of an academic institution/university are to conserve the knowledge, impart teaching, conduct research, providing extension services, bringing out publications and to make necessary interpretations from time to time.

The library is considered as the nerve center of an academic institution. The libraries of engineering colleges play a significant role in accomplishing the missions and goals of the institution. They acquire, organize and maintain informative materials that are helpful to its users. These resources could meet current and anticipated need of their users. The demand of libraries of engineering colleges goes on dynamic from time to time owing to new services, new products, developments, new approaches of selling, etc., tailored by their organizations and agencies.

The librarian must reevaluate the nature of collection so as to make it more relevant (Bruce and Philips)[3]. Hence, there are three major and most important components which together make up a library are: users, staff and collection. The success of every library ultimately depends on its collection. Every other operation in the library is based on the holdings of the library. Classification, cataloguing, reference services and ideal building equipment become meaningless, if the library is devoid of worthy books and other reading material in adequate numbers. Future generations will probably blame us or praise us not because of fine catalogues, classification of schemes, circulation system and reference techniques but what we manage to save, and pass on to them**.**

All the stakeholder institutions under the government, private, national, international, local and regional, which have commitment and interest in quality education, recognized the library services are important inputs for bringing excellence in teaching and learning process are vital components of educational activity. In addition to that library is considered as a repository of knowledge, an important center of learning, heart of an academic institution and an organ around which all the academic activities revolve. It exists to support and serve academic programs viz., learning, teaching and research. Depending upon the organization/institution, the library has different aims and objectives.

## 2. Statement of the Problem

The present study is envisaged under the title of "**Collection Development In Dr. BR Ambedkar Central Library University College Of Engineering Autonomous JNTUK Kakinada: A Study"**.

### 2.1 Collection Development

'Collection Development' is a process of planning, building, and maintaining libraries information resources in a cost-efficient and user-relevant manner. Principal activities include the identification, selection, and sometimes procurement of locally appropriate materials; the allocation of the resource budget among different subjects and formats; and the determination and coordination of policies and procedures governing these functions (Harloe, 1994)[4].

### 2.2 DR B R Ambedkar Central Library

In this study 'DR B R Ambedkar Central Library' attached to University College of Engineering Autonomous Under Constituent college campus of JNTU Kakinada where Collection Development in Engineering Education is chosen for the study.

### 2.3 JNTUK

The abbreviation of the JNTUK stands for Jawaharlal Nehru Technological University, Kakinada.

### 2.4 A Study

A specific type of research involves critical thinking skills and the evaluation of facts and information relative to the research being conducted.

## 3 Objectives of the Study

The main objectives of the study are:

1. To find out the state-of-art collection development in Dr BR Ambedkar central Library University college of Engineering Autonomous JNTUK, Kakinada.
2. To examine the status of Collection Development in Dr B R Ambedkar central Library University college of Engineering Autonomous and the budget provision for collection development under the present study.
3. To analyze the application of information and communication technologies and their impact on University college of engineering in the context of Collection Development.
4. To identify and assess the feasibility of building digital resources.
5. To analyze the data collected on the collection maintenance activities in the Dr BR Ambedkar central Library
6. To offer appropriate suggestions for the effective collection development on the part of the present study.

## 4 Scope of the Study

The present study has the following limitations.

1. This study has covered only select constituent university college of engineering Autonomous JNTU Kakinada which was established in the year of 1946 before independent.
2. This study is primarily concerned with the data provided by the librarian of the select University College of engineering Autonomous under the Jawaharlal Nehru Technological University, Kakinada.
3. The students and faculty members are not covered in the study.

## 5. Hypotheses

In this study, the following hypotheses are formulated:

1. There exists the Collection Development University college of Engineering Library under study and proper provision for the budget allocation to the library.
2. There exists the Information Communication Technology application in its impact on the Collection Development.
3. The Library under study is building up of the electronic and digital resources.
4. There exists the collection maintenance in the university college of engineering Autonomous Dr B R Ambedkar Library

## 6 Research Methodology of the work

In the present study the relevant data is collected through the primary and secondary information sources. The Researcher begins the research study with the literature search. The primary source for literature search is LISA (Library and Information Science Abstract) database and LISTA (Library and Information Science and Technology Abstract). The investigator also studied the other sources such as bibliographies and other indexing and abstracting journals.

As part of the primary source the investigator adopted the survey method. The tools for collecting data are through questionnaire. The questionnaire is designed in such a way to collect the primary data from the librarian of select University college of engineering Autonomous Dr BR Ambedkar Library JNTU Kakinada. The observation and interview techniques are also used where ever necessary for the collection of primary data. The data collected is analysed in the light of the objectives stated. The hypotheses are tested with the data obtained from the analysis. Necessary statistical techniques and methods are used to analyse the research data.

After the completion of analysis the findings and conclusion are drawn and they have been presented in the form of reports. In doing so, the statistical graphs, charts and figures are used with clarity and simplicity of presentation. The investigator examined and tested the secondary sources such as journals, reports and conference proceedings. Further it also necessitated the adoption of historical method in a limited way.

## 7. Limitations of the Study

This study has covered only Jawaharlal Nehru Technological University Constituent University college of engineering Autonomous Dr BR Ambedkar central Library The students and faculty members are not covered in the study

# 8 Need and Significance of the Study

The study aims at knowing the nature of library collection in different disciplines, the resources available in the library and the services offered by these library. Therefore, it is necessary to conduct a study on how the collection development is done in the constituent college campus under JNTUK, Kakinada and its use to the students and faculty members. It is expected that the findings of this study will be useful for these library in re-orienting their collection building process, services and facilities. Such studies are necessary not only to identify the gaps but also to find solutions to improve the quality of library collection development and services

## 8. Data Analysis

After the collection of the data from the librarian the data were checked and analyzed according to the objectives and hypotheses stated. First the data has been fed into the computer. The data has been tested with various statistical tools (Descriptive statistics, WAM, Percentage, Cluster analysis and rank test) by using the SPSS. The data has been presented in the form of tables, graphs and figures. Details regarding some of the tools/techniques used are given below.

**Administration of questionnaire for librarian**

The adapted questionnaire was administered the librarian and the response rate is 100%.

**Table 1- University College of Engineering, Kakinada**

| S.NO | CODE | COLLEGE NAME | DIST | YEAR OF ESTABLISHMENT |
|---|---|---|---|---|
| 1 | JNTK | University College of Engineering , Kakinada | East Godavari | 1946 |

**Conclusion**

Academic college libraries within the university campus maintain huge collections of information resources and organization them according to the satisfaction of the users is the most significant task of information professionals (Rupak&Shalini, 2012). This study examined the level of users' satisfaction with the policies and procedures of collection growth and management in satisfying Frequency distribution of respondents' recommendations and suggestions to improve the effectiveness of library collections.

**Suggestions**

There are various issues that might hamper effective collection development and management and can resultantly create problems for the user community to get and access the right piece of information. Some of these issues may consist of lack of proper interest

by library management and their insufficient efforts toward playing active roles for the effective collection development and management

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# Total Quality Management (Tqm) in k.s.r.m. College of Engineering College Library-A Study

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## Abstract

*The goal of this study is to find out how Total Quality Management (TQM) practices and initiatives affect organizational performance. Total Quality Management (TQM) is described as a tool focused at developing and delivering high-quality goods and services that meet all of the needs of consumers while also achieving a higher customer satisfaction. The implementation of comprehensive quality management in K.S.R.M. College of Engineering (Autonomous) is discussed in this paper.*

**Key words:** *Total Quality management, organizational performance, customer satisfaction, Continuous quality improvement, organization effectiveness*.

## Introduction

Total quality management (TQM) is defined as a management technique that focuses on long-term performance through customers' satisfaction. All people in the organization participate in a TQM endeavor by working to improve processes, products, services, and the culture wherein they operate. Any academic institution's library is its heart. Libraries have long made it a priority to provide high-quality services to their patrons. Libraries are gradually gaining recognition for their academic offerings, and they now play an important role in education all around the world. A quality-driven company should strive for perfection by constantly improving its business and production processes. Total quality management is a technique for involving management and staff in the ongoing

improvement of performance. In today's libraries, the TQM technique is progressively gaining traction. TQM is the skill of overseeing the entire process in order to attain excellence. The ramifications of the TQM implementation in the K.S.R.M College of Engineering college library were examined in this research.

## Institute Profile

The institution exists because of Late Kandula Obul Reddy's strong desire to improve technical education in the Rayalaseema region of Andhra Pradesh. In 1979, under the auspices of Sri Kandula Obul Reddy Charity, a Technical Training Institute was established in Vempalli, Kadapa District, in order to realize his noble objective of giving technical education. K.S.R.M. College of Engineering was founded in 1980 to honor the memory of Late Sri K. Srinivasa Reddy, the youngest son of Late Sri K.Obul Reddy. Sri K. Srinivasa Reddy, a talented student of Mechanical Engineering in the third year at Delhi College of Engineering in New Delhi, died tragically in a scooter accident on October 18, 1979. Sri T. Anjaiah, the Chief Minister of Andhra Pradesh, formally opened the institution on November 14, 1980, and it began operations in the academic year 1980-81. The College site is located 7 kilometers from Kadapa town on the Kadapa-Pulivendula Highway, in a tranquil and healthy 35-acre setting. The College is located in a tranquil setting with plenty of vegetation and fresh air. The departments are housed in four multi-story RCC constructions totaling 26,700 square meters. A dedicated electric power feeder and a 250 KVA substation are available at the College.

## About the Library

The library is one of the important facilities and is well developed with digital library and reprographic facilities. A three-storied central library serves as the depository of knowledge for the students, staff, and faculty. The Library is so large that it can hold over 300 people at once. The library now comprises 65,384 volumes and is continually being supplemented with new literature in the form of encyclopedia, periodicals, textbooks, reference books, national and international journals, and CD-ROM. In addition, new Programmers are given access to basic literature. Because of the increasing value of this knowledge treasure, it has been totally mechanized. The college maintains a book bank for students from underrepresented groups, such as Scheduled Castes and Scheduled Tribes. Students in this category must follow the guidelines that have been established for this purpose.

## Objectives of the Study

To Know

- The working environment
- The scale of library resources
- The facilities of the library
- The level of awareness on TQM among the library professionals
- The man power in the library

## Scope of the Study

The study is confined to K.S.R.M. COLLEGE OF ENGINEERING (AUTONOMOUS), KADAPA students. This study used a random sample of 154 students from various disciplines.

## Methodology

A standardized questionnaire was created to collect feedback from the students while keeping the study's main goals in mind. The information was gathered by hand from students at K.S.R.M. College of Engineering (Autonomous), Kadapa. The questionnaire is given to 210 students. Out of 210 students, 154 students have submitted the filled questionnaire.

## Analysis of the Study

**Table 01: Opinion about working hours**

| S. No | Working Hours | No. respondents | Percentage |
|---|---|---|---|
| 1 | Convenient | 126 | 81.81 |
| 2 | Inconvenient | 28 | 18.19 |
| **Total** | | **154** | **100.00** |

Table 1 shows that 81.81 % of the respondents felt that the working hour is convenient and they happy with the working hours of the library, 18.19% have referred it was inconvenient and they felt unhappy with the working hours of the library.

**Table 02: Sufficient staff at the Library**

| S. No | Sufficient staff | No. respondents | Percentage |
|---|---|---|---|
| 1 | Satisfied | 139 | 90.25 |
| 2 | Not satisfied | 15 | 09.75 |
| **Total** | | **154** | **100.00** |

Table 2 indicates that 90.25 % of the respondents are satisfied with the sufficient library staff working in library and 9.75% respondents are not satisfied with the sufficient library staff.

**Table 03: Library Resources Obtained by the Respondents**

| S. No | Library Resources | No. respondents | Percentage |
|---|---|---|---|
| 1 | Textbooks | 134 | 87.01 |
| 2 | Reference books | 127 | 82.46 |
| 3 | Journals & Magazines | 129 | 83.76 |
| 4 | Newspapers | 117 | 75.97 |
| 5 | Dictionaries | 112 | 72.72 |

(Multiple answers were allowed)

Table 3 depicts that 87.01% of the respondents visiting library to borrow/refer text books, 82.46% of the respondents visits library for referring reference books, 83.76% visits library for the sake of Journals and Magazines, 75.97% visits library for utilizing Newspaper service and 72.72% visits library for referring Dictionaries.

**Table 04: Facilities Available in the Library**

| S. No | Library Facilities | No. respondents | Percentage |
|---|---|---|---|
| 1 | Internet | 134 | 87.01 |
| 2 | Reprographic | 119 | 77.27 |
| 3 | Scanner & Printer | 111 | 72.07 |
| 4 | Adequate Lighting | 138 | 89.61 |
| 5 | Seating Capacity | 126 | 81.81 |

(Multiple answers were allowed)

Table 4 reveals that 87.01% of the library visitors visiting library are using Internet available in library. College library does not provide reprographic facility, scanner and printer to all library users (faculty and students) for all purposes even though library has reprographic facility, scanner and printer. But, it is provided for educational purpose like taking the printout of journal articles, magazines, e-books, other database materials like DELNET, and Xerox copies of their certificates etc. Approximately, an average 70% of library users are visiting library for these facilities along with other facilities available in the library. 89.61% of the library visitors have responded adequate lighting facility is available in the library and 81.81% have responded adequate seating capacity is available in the reading section.

**Table 05: Library Services**

| S. No | Library Services | No. respondents | Percentage |
|---|---|---|---|
| 1 | Reference services | 124 | 80.51 |
| 2 | Newspaper clippings | 116 | 75.32 |
| 3 | e-Resources | 126 | 81.81 |
| 4 | Previous Years Question Papers | 115 | 74.67 |

(Multiple answers were allowed)

Table 5 represent that 80.51% of the library users visiting for reference purpose, 75.32% visits the library for reading newspaper, 81.81% visits library for accessing the e-resources available in the library and 74.67% visits the library for taking the Xerox copy of the previous year question papers.

**Table 06: Awareness of Total Quality Management**

| S. No | Awareness of TQM | No. respondents | Percentage |
|---|---|---|---|
| 1 | To great extent | 52 | 33.78 |
| 2 | Some extent | 69 | 44.80 |
| 3 | Extent | 20 | 12.98 |
| 4 | No response | 13 | 08.44 |
| **Total** | | **154** | **100.00** |

Table 6 reveals that 33.78% of the respondents has the awareness about TQM to a great extent, 44.8% has some extent, 12.98% little bit and 8.44% not given any response.

## Major Findings

- 81.81% of the respondents felt that working hours is convenient.
- 90.25% of the respondents satisfied with the present library staff.
- 87.01% of the respondents visits library to refer textbooks along with other services.
- 87.01% of the respondents visits library to use internet services along with other services.
- 80.51% of the respondents visits library for reference purpose along with other services.
- 33.78% of the respondents are aware of TQM to a great extent.

## Suggestion

Working hours are inconvenient for 18.19 percent of respondents. It is also suggested that working hours be increased to 8 p.m., as well as working hours on holidays.

## Conclusion

The implementation of TQM and its application to libraries has been explored in this work. TQM necessitates patience and perseverance. In order for an organization to succeed, it must have top-down support and dedication at all levels. Textbooks, reference books, newspapers, competitive exam-related books and periodicals, college-sponsored course-related material, and so on are all part of the library's collection. TQM can be implemented using libraries. Librarians may alter and improve their organizations by developing a strategic plan and sticking to it with a dedication to continual quality improvement. TQM helps to detect the academic environment's productive progress. According to the findings of this study, such notions will help to strengthen the old system.

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# Leadership in the Library, in Your Way

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**Abstract:**
*Creating a library's informational architecture is done with the user's needs in mind. Librarian leadership competency is determined by the obligations, duties, and abilities required to manage resources, services, and staff. Librarians' roles are becoming more vital and demanding in today's technologically advanced information era, as they are required to design and manage hybrid libraries using a user-centric strategy. There is a high demand for skilled library personnel due to patrons' various informational needs and growing technologies in libraries. India's current library science practices lead professionals toward deep managerialism rather than dynamic leadership. Due to such tactics, professionals cannot be more inventive, creative, and culturally effective leaders. The current essay discusses and addresses some of the librarians' qualities to progress from managers to leaders. This article aims to motivate young library workers to develop managerial skills and flourish professionally.*

**Keywords:** *Library leadership, librarian leadership, effective library leadership, and leadership competency*

**Introduction:** A leader is like everyone else and has personal needs and hopes. In addition, he enjoys the formal authority and power of an influential position. The task of a leader is called leadership. Therefore, leadership can be defined as the exercise of influence in an organization in which the other persons attribute leadership qualities to the leader. The leader should create a framework for activities, maintain norms and policies, motivate fellow members of the group and allow others to prove their efficiency. He should be aware of changes in the broader environment and the organisation's internal structure. In a particular situation, the leader has to make the right decision to organise and implement a task.

**2. Qualities of Leader:** In the twentieth century, most beliefs claimed that exceptional leaders were born, not made. According to recent research, leadership is significantly more complicated and cannot be reduced to a few fundamental personality traits. Years of observation and research have shown that a single feature, or a group of attributes, does not produce a great leader. Scholars have concluded that an individual's leadership attribute, such as intelligence,

assertiveness, or physical attractiveness, does not change from circumstance to situation. However, each vital feature may be applied to challenges that differ depending on the circumstances. While conditions in a complex social scenario change due to external variables, no single pattern of behaviour or strategy is equally beneficial in all cases. The following are some of the most prevalent characteristics of a leader:

- Hard worker and intelligent;
- Assertiveness;
- Well qualified, academically and professionally;
- Entrepreneur;
- Always resourceful;
- Spokesman and disseminator;
- Disturbance handler or conflict handler;
- Resource allocator, and
- Physically attractive

Henry Mintzberg, in his "the nature of managerial work" (1973), described the following roles to be played by the top man in management.

- Figurehead;
- Leader;
- Liaison;
- Monitor;
- Disseminator;
- Spokesman;
- Entrepreneurs;
- Disturbance handler;
- Resource allocator; and
- Negotiator

**3. Theories on Leader:** Different theories describe a leader's qualities and function differently.

**a) Trait Theory of Leadership:** The idea that leadership is based on individual attributes and rooted in specific individuals' characteristics is known as the trait theory of leadership. The trait leadership theory is developed from early leadership research that research was focused mainly on identifying a set of heritable characteristics that distinguish leaders from non-leaders. Leaders are regarded as superior under this viewpoint, and subordinates are expected to follow them because of their traits. The concept of characteristic leadership can be traced back to Thomas Carlyle's "great man theory," according to which "The History of the World [...] was the Biography of Great Men." Francis Galton, influenced by Carlyle, expanded on this theory in "Hereditary Genius: An Inquiry into its Laws and Consequences" (1869).

**b) Managerial Grid Model:** Robert R. Blake and Jane Mouton created the managerial grid model in 1964 as a style leadership approach. Based on the concern for people and production, this model first identified five different leadership styles. The model is shown as a grid, with the x-axis representing the production and the y-axis expressing respect for people; each axis runs from 1 (low) to 9 (high) (High)

**c) Contingency Theory:** Fred Fiedler presented the contingency theory of leadership, generally known as Fiedler contingency theory. A contingency theory is an organization theory that claims there is no one-size-fits-all approach to structuring, leading, or making choices in an organization. Instead, internal and external factors dictate the appropriate path of action. Contingent leaders are capable of picking and adjusting simple approaches to match a change in the organization's position at a certain moment in time.

**d) Three Levels of Leadership Model:** James Scouller developed the Three Levels of Leadership leadership concept in 2011. The 3P leadership model is another name for it (the three Ps standing for Public, the Private and Personal leadership). It was created as a useful tool for enhancing a person's leadership presence, knowledge, and ability. Its goal is to describe what leaders must do to deliver leadership to their group or organisation and to grow as leaders both technically and psychologically.

**e) Transformational Leadership:** Transformational leadership is a leadership theory in which a leader works with teams or followers beyond their immediate self-interests to identify changes that are needed, create a vision to guide the change through influence, inspiration, and execution in collaboration with committed members of a group. The follower's maturity, values, and concerns for the achievement are all elevated as a result of this shift in self-interest. When a leader's actions motivate and inspire people to perform beyond their perceived capabilities, this is referred to as transformational leadership. The concept of transformative leadership was first developed by James V. Downton.

**f) Transactional Leadership:** Leaders that practise transactional leadership use both rewards and penalties to encourage followers to comply. Transactional leaders look for flaws and deviations in their followers' work. Transactional leaders can keep followers motivated in the short term by using a rewards and punishments system. This form of leadership is beneficial in times of crisis and emergencies, as well as for initiatives that require precision execution.

**g) Laissez-faire Model:** "Let them do (what they want)" is how the French phrase "laissez-faire" is translated. This is the least active method of leading others. This leadership style is defined by the avoidance of responsibility and can be perceived as the absence of leadership. No restrictions are in place, and employees are free to

make their own decisions. When it comes to the impact of the leader's perspective on the team, laissez-faire is the least effective leadership style.

**h) Leader-Member Exchange (LMX) Theory:** The LMX theory is a relationship-based approach to leadership that emphasises the two-way (dyadic) relationship between leaders and followers. The purpose of the LMX theory is to explain how leadership affects individuals, teams, and organisations. According to the hypothesis, some team members have great trust, emotional, and respect-based connections with their leaders, while others do not. It is possible to improve interpersonal interactions. According to the LMX theory, leaders do not treat each subordinate equally. The attitudes and behaviours of those subordinates at work are influenced by how their boss treats them. Fred Dansercau, George Graen, and William J. Haga devised the LMX hypothesis, or Vertical Dyad Linkage Theory, in 1975.

**Path-Goal Theory:** Robert House, an Ohio State University alumnus, created the path-goal theory of leader effectiveness in 1971 and refined it in 1996. According to the thesis, a leader's actions are determined by the contentment, motivation, and performance of his or her subordinates. The new version additionally claims that the leader's actions complement and compensate for the subordinate's strengths. The task-oriented parts of the path-goal model can be classed as instrumental leadership, according to Robert House and John Anton.

**4. Librarian as a Leader:** The librarian should have the qualities of a leader so that his subordinate derives inspiration from him. He should always favour his subordinates' interest and enthusiasm for the profession and loyalty to the organization by his examples. Today most librarians are discharging their function as a leader.

**a) Secretary of the Library Committee:** Librarians are the member secretary of the library committee, and he has to prepare the agenda for the committee meetings.

**b) Conduct Conference, Seminar and Orientation:** Librarians nowadays attend conferences seminars and conduct regular orientation classes for the new members of the library.

**c) Solves Problems of the Library:** Due to the rapid changes in the environment and the education trend, libraries are constantly facing problems. A librarian is a well-qualified person academically and professionally, so their subordinate can seek a solution from them when confronted with various issues.

**d) Take Decision:** Librarians can take decisions in matters related to the library.

**e) Gives Order and Direction:** Orders and direction, and instruction are issued from the librarian, and the respective level of subordinates implements these.

**f) Represent the Library and Staff:** The librarian represents the library and its staff in all internal and external matters related to the library.

**g) Guide and Motivate the Staff:** The librarian guides, directs and motivates all their subordinates who work with and accomplish the results as per the plans and policies. Librarians also build confidence among the library staff.
**h) Build Morale:** Morale is expected as the attitude of the staff towards an organization. High morale leads to increased service. Librarians build the confidence of the team.

**5. Problems in Discharging the Leadership Duties for the Librarians:** Some of the problems associated with the librarian in carrying out the leadership roles are

- ✓ The majority of librarians in school and public libraries do not have any subordinate staff. So, they cannot perform their function as a leader.
- ✓ The librarians sometimes do not get proper recognition from the parent organization and society. This creates emotional problems to carry out the function of a leader.
- ✓ The salary and wages of the private sector librarians generally are not up to the mark. So, they don't feel motivated to perform their function as a leader.
- ✓ When the librarians are less qualified academically and professionally than others in the organization, they cannot compete with the members of the parent organization to discharge their duties as a leader.

## Conclusion:

Leadership is a research topic as well as a practical talent that encompasses an individual's, group's, or organization's ability to lead, influence, or direct other people, teams, or entire organisations. Traits, situational interaction, function, behaviour, power, vision and values, charm, and intelligence have all been studied in relation to leadership. The same leadership style may not be appropriate in various situations. As a leader, the librarian must learn how to get things done, fulfil the institute's mission and vision, and meet the needs and expectations of the people who work for them.

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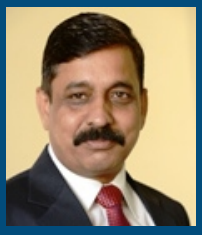
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