

## Re-Engineering Library and Information Services through e-Resources for Academic Excellence: A Study of Selected NITs in India

Deep Singh<sup>1\*</sup> and Dr. Asha Sharma<sup>2</sup>

<sup>1</sup>Research Scholar, Faculty of Social Sciences, Banasthali Vidyapith, Rajasthan

<sup>2</sup>Deputy Librarian, Central Library, Banasthali Vidyapith, Rajasthan, India

\*Corresponding Author Email: dsingh.mnitlib@gmail.com

**Abstract:** In present IT era, almost all the sectors of the society are transformed. Academic institutes have also yet to escape from transforming traditional systems into ultra-modern facilities. Library and Information Centres have improvised their infrastructure and services. They have adopted several modern techniques and transformed them into Digital Libraries/ Modern Libraries. For academic excellence in Research Education in IITs, IIMS NITs, IISERs, etc., they procure e-Resources and make them available to their Users, especially to Faculty members, Research Scholars, and Research project holders. There are 31 National Institutes of Technology (NITs) in India. Some are very old and have all infrastructure at the level next to IITs. A research study of selected fully equipped 15 NITs was done, and the data was collected from different sources and Questionnaires. All 15 NITs are well-equipped for research studies and have required e-Resources for various subject areas. e-Resources comprise different types of resources accessible within the campus and remote access. The questionnaire was shared with all the 15 NITs Librarians/ staff to collect the data and from other sources. As per the survey, all the selected NITs have 100% facilities and infrastructure like Internet facilities (LAN+ Wi Fi), Operating systems, Library Management Software, membership of e Shodh Sindhu (ESS) Consortium, subscription to Important e-Resources, features of the e-Resources, problems being faced in subscribing e-Resources, selection criteria of e-Resources, availability of budget, utilization of budget, availability of technical staff. It has also been studied that all the NITs have almost common issues, joint problems, standard facilities, and expected benefits.

**Keywords:** Digital Library, e-Journals, e Shodh Sindhu consortium, e-Resources, NITs, Questionnaire,

### 1. Introduction:

e-Resources refer to digital materials and information that can be accessed and utilized for academic purposes. These Resources play a crucial role in enhancing academic excellence by providing students, researchers, and educators with a vast range of information and tools. These e-Resources not only diagnose the problems and issues of society but also give solutions, as shown in the below figure.



**Figure- 1: Development and use of e-Resources**

Engineering, Science, and Technology (E.S.T.) support designing, manufacturing, and producing

for our modern civilization. The socio-economic progress of a country is dependent on E.S.T. For the nation's development, advancement in E.S.T. is mandatory. In the present I.T. era, constant research work in academic and Research institutes is essential for the nation's development [1].

India has the most significant number of engineers and the largest number of engineering education institutions globally. As of 2021, India produces one million engineering graduates annually. Around 8997 technical institutes in India where more than 29 lakh students are studying. Apart from this, more than 10 lakh students are taking technical education from other institutes. Information technology is invented and used by most engineers; hence, information resources are needed the most in engineering education. In India, many changes have been made in the education system to train engineers according to

the global standard. According to the industry requirement, various types of e-Resources are made available to the students so that they can do Research going globally and simultaneously Understand the upcoming changes in technology Libraries are the backbone of the education system of any institute. Through library resources, students fulfill their teaching-learning requirements [2].

#### **Types of e-Resources:**

Various types of e-Resources are available that cater to different needs and purposes [3]. Here are some common types of e-Resources:

- e-Journals: Electronic or e-journals are digital versions of scholarly journals, like IEEE Xplore, ACM Digital Library, ASME, ASCE, Emerald, Science Direct (Elsevier) etc.
- e-Books and Digital Libraries: e-Books are digital versions of books that can be accessed and read on electronic devices.
- Databases: These are digital collections of academic journals, articles, research papers, and other scholarly materials. Examples include JSTOR, PubMed, and ProQuest. Abstracting and indexing services are also provided through these databases.
- Open Educational Resources (OERs): These are freely accessible teaching and learning materials that can be used, shared, and modified.
- Online Courses and Massive Open Online Courses (MOOCs): Online courses are web-based courses offered by educational institutions or online learning platforms.
- Academic Search Engines: Academic search engines like Google Scholar, Microsoft Academic, and Scopus allow users to search for scholarly articles, research papers, conference proceedings, and other academic resources.
- Multimedia Resources: E-Resources include multimedia elements such as educational videos, podcasts, webinars, and interactive tutorials. Platforms like YouTube, TED Talks, Vimeo, and iTunes U offer a wealth of multimedia resources for educational purposes.

- Research Tools and Software: Various tools and software support the research process, including citation management tools like Zotero and Mendeley, data analysis software like SPSS and R, reference management software, and research collaboration platforms like Overleaf.
- Virtual Libraries and Archives: Virtual libraries and archives provide access to historical documents, manuscripts, images, and other primary sources.
- Collaborative Tools and Platforms: E-Resources also encompass collaborative tools and platforms that facilitate communication, document sharing, and teamwork.

These are just a few examples of the diverse types of e-Resources available. The digital landscape continuously evolves, and new e-Resources emerge to meet the changing needs of education, Research, and information access.

#### **Utility and need of e-Resources:**

The utility and need of e-Resources, or electronic resources, are significant in today's digital era [4]. They fulfill various purposes and address the evolving needs of individuals, institutions, and society. Here are some key points highlighting their utility and Need:

- Access to Information: e-Resources provide easy and widespread access to vast information. They enable users to retrieve scholarly articles, research papers, books, and other relevant materials from various disciplines.
- Convenience and Flexibility: e-Resources offer convenience and flexibility in accessing and utilizing information. Users can access resources from anywhere, anytime, using various devices such as computers, laptops, tablets, or Smartphones.
- Cost-effectiveness: E-Resources often eliminate the need for physical copies of books, journals, and other printed materials. This reduces costs associated with purchasing, storing, and maintaining physical resources.
- Currency and Timeliness: E-Resources provide access to the latest and most up-to-

date information. Online databases, e-journals, and digital libraries often offer real-time updates and immediate publication of research findings.

- **Expanded Learning Opportunities:** e-Resources broaden learning opportunities beyond traditional classrooms and physical libraries. Online courses, videos, interactive tutorials, and open educational resources (OERs) offer self-paced, personalized, and lifelong learning options.
- **Global Collaboration and Connectivity:** e-Resources foster global collaboration and connectivity among researchers, educators, and students. Online platforms, forums, and communication tools facilitate interaction, knowledge exchange, and collaboration regardless of geographical location.
- **Enhanced Research and Innovation:** e-Resources empower researchers and innovators by providing quick and efficient access to relevant literature, data, and tools. They streamline the research process, enable interdisciplinary exploration, and encourage innovation.
- **Environmental Sustainability:** e-Resources contribute to environmental sustainability by reducing the consumption of paper and other physical resources. By accessing digital versions of materials, fewer trees are cut down, and less waste is generated.
- **Accessibility and Inclusivity:** e-Resources promote accessibility and inclusivity by overcoming barriers faced by individuals with physical disabilities, geographical limitations, or other challenges. Digital formats, such as larger font sizes, screen readers, and translations, can be adjusted to suit specific needs.
- **Preservation and Archiving:** e-Resources facilitate preserving and archiving valuable knowledge and cultural heritage. Digital libraries, archives, and repositories ensure that historical documents, rare books, and significant research findings are preserved and accessible for future generations.

The utility and need of e-Resources lie in their ability to provide widespread access to

information, promote convenience and flexibility, support cost-effective learning and Research, foster global collaboration, enhance innovation, and contribute to sustainability and inclusivity. They have become essential to modern education, Research, and lifelong learning.

E-Resources are transforming the library system and the way Research-based studies are done. It has made simple and speedy purchases of information sources like books, journals, and electronic publications. The development of information technology and the dissemination of Web environments dramatically affect user behaviors in information usage. This study is mainly based on the availability and utilization of e-Resources in the National Institute of Technology (N.I.T.) libraries; for this particular, 15 N.I.T. institutes libraries have been selected are the oldest.

## 2. Literature Review:

A literature review is a critical and comprehensive summary and analysis of the existing literature and Research studies on a specific topic. It involves systematically identifying, evaluating, and synthesizing relevant sources such as books, scholarly articles, research papers, and other published materials.

The purpose of a literature review can vary depending on the discipline and research context. However, some common objectives include: Identifying the current state of knowledge, Evaluating the quality of Research, identifying research gaps, providing theoretical and conceptual frameworks, supporting research methodology and design, and synthesizing and integrating findings. It is important to note that a literature review is not simply a summary of existing sources. It requires critical analysis, interpretation, and synthesis of the literature to create a cohesive and well-supported narrative that contributes to understanding the research topic. The literature review serves as a foundation for Research, helps researchers situate their work within the existing knowledge base, and guides the development of research questions, hypotheses, and methodologies.

Bhardwaj and Sharma (2022) [5] conducted a study of 900 respondents chosen from 4 central universities in Delhi, with data analysis done by Linkert scale via questionnaire. The Research presented in the study will be valuable in developing policies that will effectively manage electronic information resources in university libraries, enabling patrons to use the services efficiently and courteously. The study demonstrated how e-Resources significantly influence research researchers at Delhi's key institutions. A substantial collection of online materials is essential to the future success of university libraries. Therefore, university libraries must update both print and electronic holdings regularly.

Kumari et al. (2022) [6] studied the usability of e-Resources among library and information science students. Ninety questionnaires were distributed to different users, of which 72 were filled out. According to the available data, many users, language barriers, a lack of user awareness, and a lack of information technology skills prevent some students from having proper access to e-Resources.

In contrast, other students are happy with the available e-Resources and digital infrastructure. Through this study, it has been recommended that the institution provide more money for e-resource subscriptions and that library staff members possess IT skills. According to an essential recommendation, library management should conduct more activities for the user awareness training program so that users may access e-Resources and obtain the information they need.

Merande et al. (2022) [7] researched the four specific libraries of Kenyan public academic libraries: Jomo Kenyatta University of Agriculture & Technology, Multimedia University, Technical University of Kenya, and Kenyatta University. In this study, e-resource access suggestions have been made, with the key ones being electronic resource training, e-resource policy improvement, user awareness campaigns, dependable internet services, and enough funding for e-Resources. Users need access to adequate computers and other multimedia equipment, and it is also

apparent that library staff members require suitable training.

Panneerdas (2022) [8] researched electronic resources' influence and utilization in a few Coimbatore Management Institute libraries. This study employs the survey approach; questionnaires are used to collect primary data. E-Journals, E-Books, databases, ETDs, E-Research reports, courseware, CDs/DVDs, and E-Newspapers are the most often used electronic resources, with 63 percent, 49 percent, 30 percent, 22 percent, and 22 percent use rates, respectively.

Regarding the benefits of using electronic resources, 45.0 percent strongly agreed with the statements "Time Saving, 46.0 percent Easy to Saving, More Informative, and Cost Saving." Accessing e-Resources through Library Orientation 25, the library staff 20, the faculty 26, the college website, the library email/circular 16, and self-exposure 21 is strongly recommended. Thirty-six percent and forty percent of respondents claim to use electronic resources for research and teaching purposes. It has been advised in this study that various marketing policies should be established and that there should be more user awareness programs for users to make better use of e-Resources.

Jamuna and Dhanamjaya (2021) [9] examined how the development of information and communication technology (ICT) has drastically altered how knowledge is acquired, stored, organized, processed, and consumed in many areas of life. The shifting ICT trend has also changed libraries' jobs and working habits. This essay thoroughly analyzes the Research on the Impact and application of electronic resources. E-Resources, such as E-Books, E-Journals, E-Theses, E-Databases, etc., are increasingly used in this new technology era, according to assessments of the published literature between 2000 and 2019.

Kumar and Anjaiah (2021) [10] conducted this study has been carried out to determine the requirement, satisfaction level, and improvement in the use of e-Resources available in various engineering college libraries by faculty members. This study has been mainly done among 300

faculty members of two engineering colleges, and according to them, they have access to e-Resources to improve teaching and learning and to publish research articles. There is an urgent need to conduct the hand-on-workshops and training programs for users for more utilization of e-Resources to deliver the current subject-related information.

Moustapha (2021) [11] investigated how patrons of the Kwara State University Library in Nigeria used electronic resources. The study used a cross-sectional survey research approach. In the library for the study, 3,670 registered users were present, and 367 samples were chosen for sampling. Data was gathered using questionnaires as the instrument. The questionnaire was distributed in 367 copies, and 345 documents were returned. Most students access e-books first in this study, followed by CDs and DVDs. According to the Type of Electronic Resources survey, 183 respondents claimed institutional repository content was not available, while 183 respondents indicated they had institutional repository content.

Mukh and Rajneesh (2021) [12]. This particular article includes the MOOCs platform, national digital library, advanced India campaign, a global initiative of academic networks, imprint India, uchchar avishkar yojana, prime minister research fellows, innovative India hackathon, national institutional ranking framework (NIRF), higher education financing agency (HEFA), Rashtriya madhyamik shiksha abhiyan (RMSA) and e-pag pathshala, etc. for knowledge and information sharing of all these platforms; a librarian is an important person who can give complete information to the students.

Sahu and Tiwari (2021) [13] Studied the various aspects of e-Resources used by undergraduate students, including frequency, awareness, reasons for accessing e-Resources, level of satisfaction, and difficulties in accessing e-Resources at colleges of Indira Gandhi Krishi Vishwavidyalaya. In the honest answer, it was discovered that 88 percent used online-Resources daily, while 13 percent did so twice or thrice a week. 58 respondents claim that their friends have informed them about e-Resources. 96 respondents said they access e-

books, 132 respondents said they access e-Krishi pathshala, e-Krishi shiksha, and e-Tutorials, 94 respondents said using e-Resources saves them time, and 93 respondents said they obtain the correct information they need from e-Resources. 67 replies said they were pretty happy with the e-Resources offered, whereas 80 responded that they had trouble accessing them. 69 respondents ascribed this to a lack of bandwidth.

Singh and Shukla (2021) [14], As per the calculation of e-Resource use by library users during the COVID-19 outbreak is based on 62 responses to questions concerning access to electronic resources. 149 faculty members from 6 private universities in the NCR region took part in the survey. Most respondents (99%) said they knew the library's online-Resources well, and 32 people said it was extremely straightforward. Out of the overall number of Elsevier (Science Direct) users, 96% have used the same service; 92 percent have utilized Volley online journals; and 59 percent are happy with the library's remote access service, with 39 percent rating it as extremely satisfied. 66 percent of faculty member respondents claimed they needed a high-speed Internet connection, 59 percent said they had trouble obtaining material because it was dispersed over many sites, and 52 percent said accessing e-Resources was challenging and complicated.

Shibin (2020) [15] studied that implementing electronic resources has significantly influenced learning methods. Due to the quick access to information today, many are choosing e-Resources. The idea of a library had transformed from a stockroom of details to a broadcasting center of knowledge. Now, digital libraries play a vital role. Almost all libraries are now becoming digital libraries. The author's proposed study is engrossed in analyzing how "research scholars" of NIT, Calicut use e-Resources in their Research. Method of Online questionnaire is used. The analysis directs that most researchers are moderately aware of e-Resources and widely used e-journals. The primary reason for using e-Resources is the availability of accurate and user-friendly information. Researchers are accessing e-Resources from libraries/department labs. However, at the same time, researchers agree that

e-Resources can never be a supernumerary for a library.

Shukla (2020) [16] studied the advancement of e-Resources by scientists. Data was collected via the "Survey Method," after that, a questionnaire was distributed and managed with a success rate of 66.92%. He investigated and evaluated various use of e-Resources amongst research scholars, for instance, purpose, frequency, categories, concerns, benefits, and structures, which research scholars favor while using the e-Resources to achieve their desired material. After analysis, it has been found that the maximum number of research scholars are aware of the Impact of e-Resources and use them to enhance their knowledge. Most of the respondents are females, around 58.62%, and are between the age of 26-30. More than 95% of people are alert of e-Resources; around 34.93% have used them for over 5 years, whereas 60.91% use them daily. 37.33% of respondents believe utilizing e-Resources is a time-saving process.

Dada and Eghworo (2020) [17], As per the study done, undergraduate students from Federal Universities in South West, Nigeria, used, could access, and were aware of electronic information resources. This survey collected 188 replies, all using electronic resources for academic reasons. Ninety percent of respondents used them for assignment purposes, seventy-five percent for Research, and 64 percent to interact with friends and co-workers. According to this survey, undergraduate students at universities often utilize electronic resources. They are also aware of the electronic resources offered by the library, but they feel these-Resources need to meet their needs. 66 percent of respondents think that librarians need sufficient training in handling electronic resources, and 82 percent believe that the library does not effectively maintain its electronic resources.

Joshua and King (2020) [18] conducted a study at Modibo Adama Technological University (MAUTEC) of Yola. The design was chosen for a mixed-method research study on how academics and students use the e-Resources of the Central Library, Ibrahim Babangida Library. In response to whether there was enough internet access for

library customers, 894 responses were collected, of which 70% said there needed to be more. 366 users were asked how familiar they are with electronic resources, and of them, 63% are aware of electronic journals, and 53% are aware of electronic books. Still, users need to be mindful of institutional repositories.

A few suggestions were made in this study, including the Need for frequent user training sessions, free WiFi, and remote access for users, as well as the Need for a user-friendly acquisition procedure in libraries.

Salman et al. (2020) [19] looked into the accessibility, availability, and usage of electronic information resources by undergraduate students in Fountain University Library, Osogbo. When doing quantitative Research, a survey research design was used to collect data. The study's population was 914, and a sample size 278 was chosen using Research Advisors. The sample size was specified through a survey, and descriptive statistics were used to examine the collected data. The Research found that twenty (20) functioning All-in-One Computer Workstations are accessible at e-Library. The study advised that more databases be added to those already in use and that more e-Resources, mainly books, and journals, be subscribed to cover all twelve of the university's curricula. This will increase customer happiness and patronage, which will help justify the substantial sum invested in the project.

Sahu and Singh (2020) [20] explored the E-Resources usage trend by Guru Ghasidas Vishwavidyalaya, Bilaspur students. This study investigates how e-contents and resources affect higher education. Data gathering from respondents is done through the use of a structured questionnaire. Both closed-ended and open-ended inquiries are included. 200 UG and PG students were individually given the questionnaire, and 176 completed surveys were returned. Respondents have been discovered to use electronic resources for studying, writing tasks, and keeping up with the topic matter. Lack of computer access and inadequate training are barriers to using e-Resources. e-Resources provide a variety of advantages, including being simple to

search, current, simple to distribute, and linked to other resources.

Ajibona et al. (2019) [21] looked at the Impact of library services on nursing students' academic performance at a few South West Nigerian institutions. In the three chosen institutions, 304 nursing undergraduates were selected using a proportional random sample approach, and the response rate was 82.24%. The questionnaire that was given to the respondents served as the data-gathering tool. The simple percentage and frequency tables of SPSS were used to assess the data. The Research demonstrates that most nursing undergraduates regularly utilize libraries, are aware of the services offered, and have been helped academically by such resources.

Ajie (2019) [22], In the investigation done by the author, information technology may be used for optimal service delivery in libraries and information centers. The investigation revealed the fundamentals of efficient service delivery and strategies for efficiently marketing information centers and libraries and providing their services. The study concludes that because information technology is evolving quickly and they risk being left behind, information centers and library staff must step outside their conventional comfort zones. The study suggests that to keep up with the speed and be relevant in the digital world; people need to train, develop themselves, and make sure they are visible internationally, among other things.

As per the above literature, it was observed that e-Resources play a significant role in the current scenario of libraries. Most researchers completed their study on the collection, development, and demand of e-Resources for existing users. The present study examines the existence of various e-Resources Databases in the education sector.

### 3. Research Methodology:

Assessing the relative advantages and disadvantages of various survey methods or techniques for data collection, some of the ways are interviews, experiments, case studies, questionnaires, etc. For this study, I have selected the leading N.I.T.s. Also, with taking care of the fact the following methods collected all the data:

- ❖ A structured questionnaire has been prepared and distributed systematically among the library staff, faculty members, and research scholars/ postgraduate students.
- ❖ Face-to-face interviews of Research Scholars/P.G. students, faculty members, and library staff.
- ❖ The collected data have been analyzed and presented in a tabular form with the help of statistical methods.
- ❖ Data has been collected through Google form by online/ offline method.
- ❖ Various e-Resources have been verified with their usage statistics for the accuracy of the data used.

**Limitation of the Study:** There are 31 National Institutes of Technology (N.I.Ts) in Engineering Science and Technology in India. Formerly known as Regional Engineering Colleges (R.E.Cs) have been upgraded and set up N.I.T.s through an act of Parliament by the Government of India. For this Research, 15 leading N.I.Ts having all Research Facilities, advanced e-Resources for the Research-based education system, well equipped library and best ICT applications have been selected .

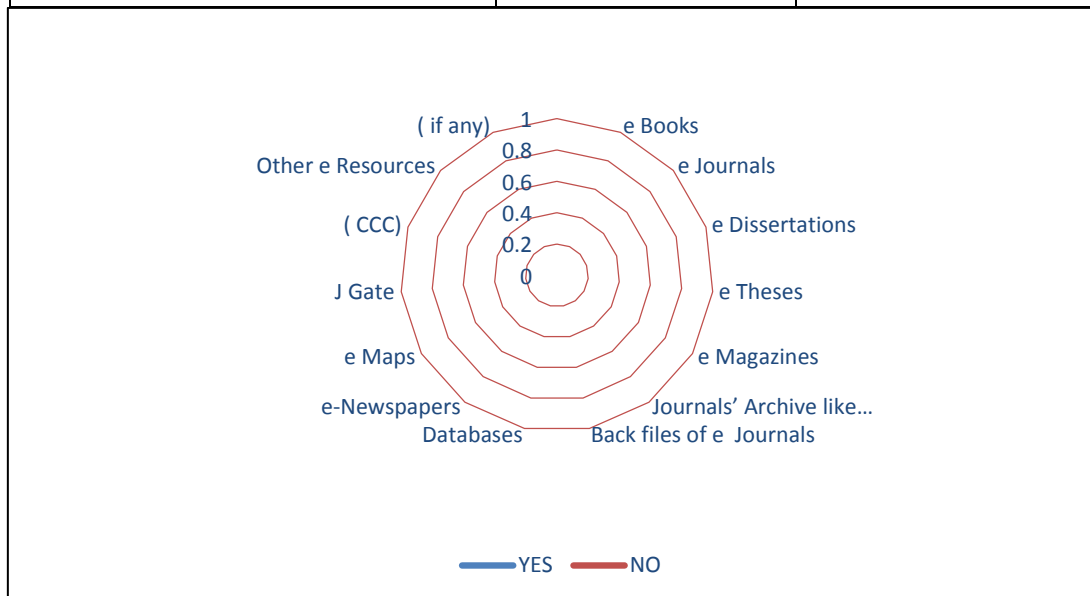
### 4. Analysis and Interpretation:

For the fulfillment of the Research work, Data have been collected from the Research Scholars of these NITs and managed in the tabulation's formats. Respondents provided information about the Availability of e-Resources collection, Funds availability, Availability of Library Staff, budget for e-Resources, Subscription mode of e-Resources, etc.

**Table 1: Availability of e-Resources collection**

E-Resources	YES	NO
-------------	-----	----

e-Books	√	--
e-Journals	√	--
e-Dissertations	√	--
e-Theses	√	--
e-Magazines	√	--
Journals' Archive like JSTOR	√	--
Back files of e-Journals	√	--
Databases	√	--
e-Newspapers	√	--
e-Maps	√	--
J-Gate (CCC)	√	--
Other e-Resources (if any)	√	--



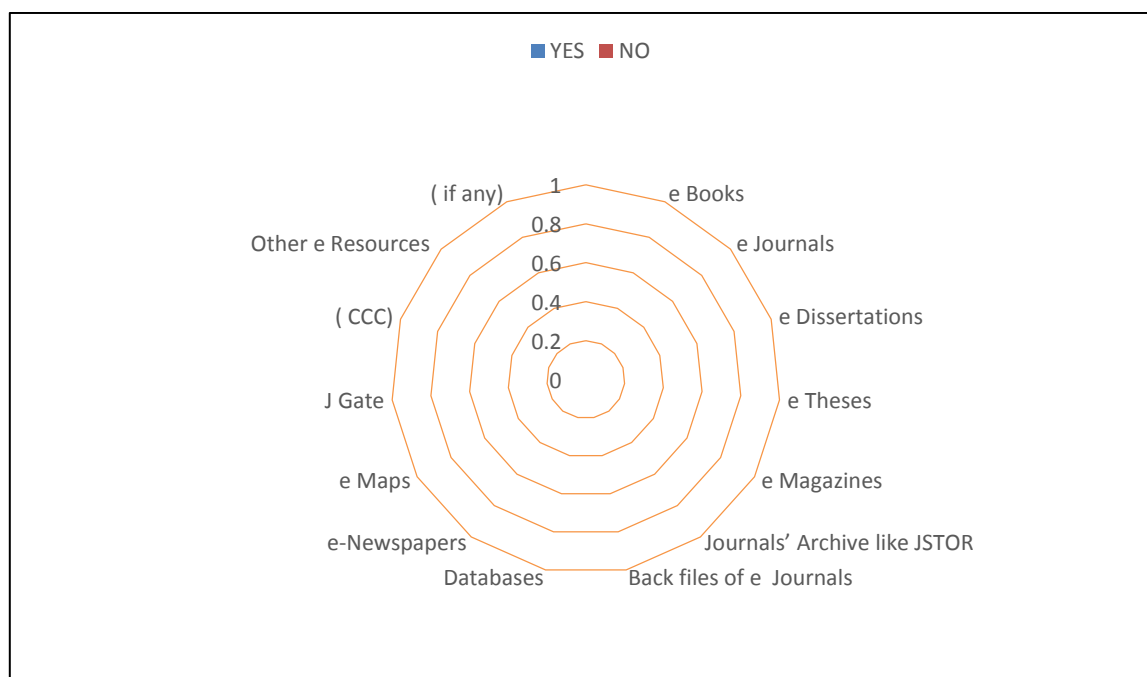
**Figure-2: Availability of e-Resources collection under each category**

National Institutes of Technology have been established with Parliament Act. The main aim of the NITs is to provide better engineering education and advancement in Research and Development in Engineering, Science, and Technology (EST). For Research education, the libraries procure several e-Resources and make them available to their Researchers. All the selected 15 NITs for this research study are subscribing to various e-Resources like e-Books, e-Journals, e-Dissertations,

e-Theses, e-Magazines, Journals' Archives like JSTOR, Back files of e-Journals, Databases, e-Newspapers, e-Maps, J-Gate (CCC). Besides these Resources, Libraries procure more useful databases and software supporting R & D work, like Anti Plagiarism software (PDS), Grammarly software, e-Encyclopedias, and many more. As per the table-1, all 15 NITs have all the e-Resources asked in the questions, hence agreed, and as per the figure-2 shows all the NITs said "Yes."

**Table 2: E-Resources subscribed by NITs**

E-Resources	YES	NO
e-Books	√	--
e-Journals	√	--
e-Dissertations	√	--
e-Theses	√	--
e-Magazines	√	--
Journals' Archive like JSTOR	√	--
Back files of e-Journals	√	--
Databases	√	--
e-Newspapers	√	--
e-Maps	√	--
J-Gate (CCC)	√	--
Other e-Resources (if any)	√	--



**Figure-3: E-Resources subscribed by NITs**

Generally, all the libraries of the NITs procure the e-Resources in different ways, like by subscribing, by Consortia based e-Resources sponsored by Govt. of India, by open sources, by complementary, by any network services (open or subscribed), etc. So in this research study, all 15 NITs were asked the question of whether they subscribe to these e-Resources, and a very

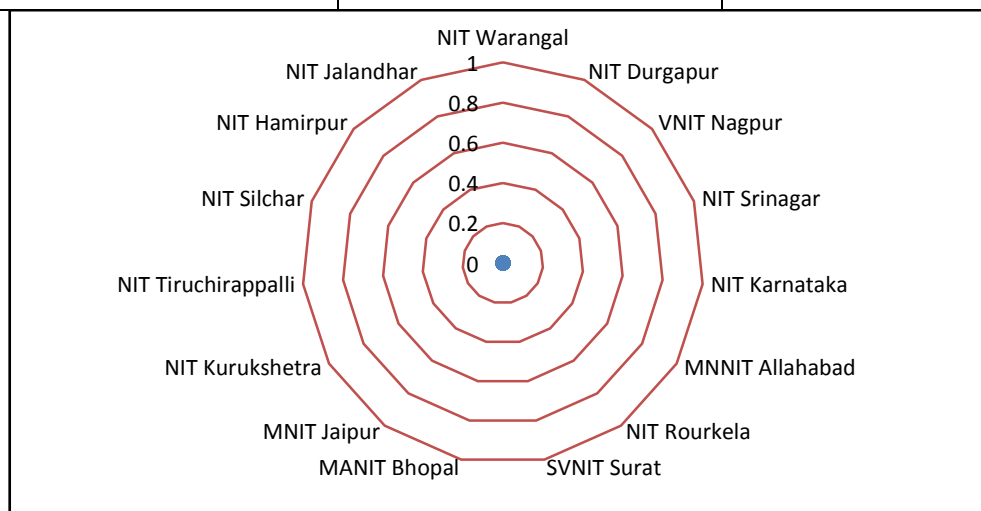
significant answer was obtained that all 15 NITs subscribed to the e-Resources required for the research scholars. Some of them are e-Books, e-Journals, e-Dissertations, e-Theses, e-Magazines, Journals Archive like JSTOR, Back files of e-Journals, Databases, e-Newspapers, e-Maps, J-Gate (CCC) as shown in table-2 and figure-3. Besides these Resources, Libraries procure more

useful databases and software supporting R & D work, like Anti Plagiarism software (PDS),

Grammarly software, e-Encyclopedias, and many more.

**Table 3: Funds available for e-Resources from Government and other sources**

Institute	Government Funds	Other Source
NIT Warangal	Yes	No
NIT Durgapur	Yes	No
VNIT Nagpur	Yes	No
NIT Srinagar	Yes	No
NIT Karnataka	Yes	No
MNNIT Allahabad	Yes	No
NIT Rourkela	Yes	No
SVNIT Surat	Yes	No
MANIT Bhopal	Yes	No
MNIT Jaipur	Yes	No
NIT Kurukshetra	Yes	No
NIT Tiruchirappalli	Yes	No
NIT Silchar	Yes	No
NIT Hamirpur	Yes	No
NIT Jalandhar	Yes	No



**Figure-4: Funds available for e-Resources from Government and other sources**

In many libraries, several funds remain for subscribing to e-Resources. Sometimes they receive funds from the Central Government, State government, Private funding agencies, social

organizations, Donations, etc. In NIT Libraries, Libraries receive funds from the Ministry of Education and the Central Government for library development, including e-Resources. As per the

survey of the selected 15 NITs, all the libraries get funds from the Central Government to meet the expenses of subscription to e-Resources (e-

Journals, e-Books, e-standards, Databases, etc.) as discussed in table-3 and figure-4.

**Table 4: Availability of sufficient Library Staff**

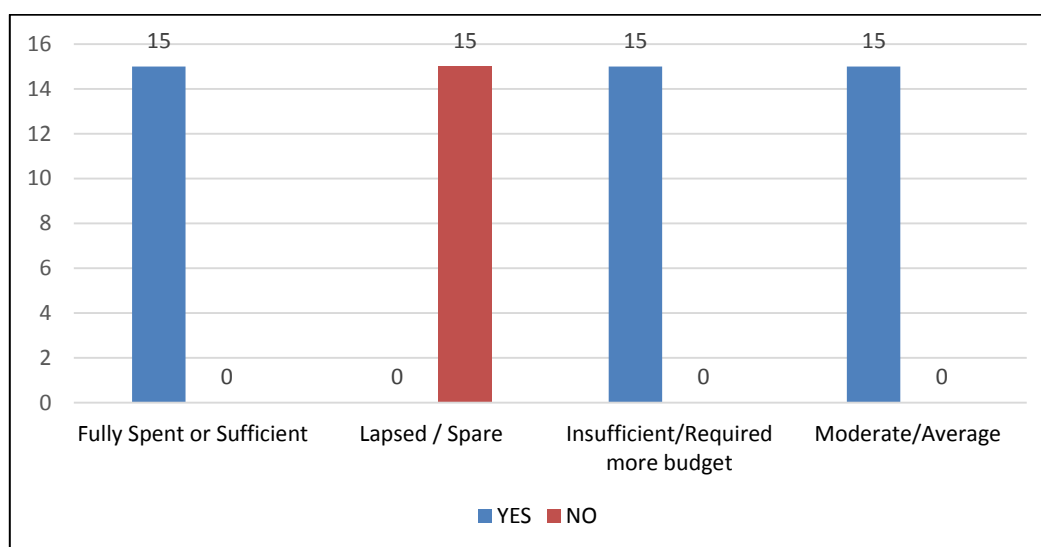
Institute	Staff	
	Yes	No
NIT Warangal	--	No Recruitment
NIT Durgapur	--	No Recruitment
VNIT Nagpur	--	No Recruitment
NIT Srinagar	--	No Recruitment
NIT Karnataka	--	No Recruitment
MNNIT Allahabad	--	No Recruitment
NIT Rourkela	--	No Recruitment
SVNIT Surat	--	No Recruitment
MANIT Bhopal	--	No Recruitment
MNIT Jaipur	--	No Recruitment
NIT Kurukshetra	--	No Recruitment
NIT Tiruchirappalli	--	No Recruitment
NIT Silchar	--	No Recruitment
NIT Hamirpur	--	No Recruitment
NIT Jalandhar	--	No Recruitment

**Figure-5: Library Staff sufficient as per NeedNeed**

Though most of the libraries always remain in shortage of staff. In the Libraries of National Institutes of Technology (NITs), a survey was done on the availability of sufficient staff, as shown in table-4 and figure-5. They responded that the staff is insufficient to provide services because no recruitment is done well in time.

**Table 5: Status of library budget for e-Resources**

Budget Status	YES	NO
Fully Spent or Sufficient	15	
Lapsed / Spare	--	15
Insufficient/Required more budget	15	---
Moderate/Average	15	---



**Figure-6: Status of the library budget**

Generally, the budget for all the libraries is allotted for various information materials—print and non-print study materials. In NITs, also libraries receive a budget for one financial year to spend on library collection, including e-Resources. After observing data received from selected 15 NITs libraries shown in table-5 and figure-6 are as below:

- Entirely Spent or Sufficient – Yes by all NITs
- Lapsed / Spare – No by all NITs
- Insufficient/Required more budget –Yes by all NITs
- Moderate/Average –Yes by all NITs

They responded that the library budget is utilized/ spent fully in time.

**Table-6: Mode of Subscription of e-Resources**

Institute	Individual	Consortium
NIT Warangal	Yes	Yes

NIT Durgapur	Yes	Yes
VNIT Nagpur	Yes	Yes
NIT Srinagar	Yes	Yes
NIT Karnataka	Yes	Yes
MNNIT Allahabad	Yes	Yes
NIT Rourkela	Yes	Yes
SVNIT Surat	Yes	Yes
MANIT Bhopal	Yes	Yes
MNIT Jaipur	Yes	Yes
NIT Kurukshetra	Yes	Yes
NIT Tiruchirappalli	Yes	Yes
NIT Silchar	Yes	Yes
NIT Hamirpur	Yes	Yes
NIT Jalandhar	Yes	Yes

Generally, Libraries used to subscribe to e-Resources individually, but after the consortia-based subscription system, Libraries became a member of it, and they used to subscribe through the Consortium. In NITs, both systems are followed for subscribing to the e-Resources. The Government of India has introduced a Consortium named e-Shodh Sindhu (ESS) for higher education. Presently all the IITs, NITs, IITs, IISERs, IISc Bangalore, and all the Government Universities are members of eSS, and their subscription amount is borne by the Government. This eSS has been established under Information Library Network (INFLIBNET) Centre, a UGC concerned, Gandhi Nagar, Gujrat, and it negotiates the subscription price with the publishers of e-Resources invited as per the needs of the member institutes. In the selected 15 NITs libraries shown in table-6, get the e-Resources through Consortium (eSS) as a cluster/ collection, and those e-Resources which are not part of Consortium are subscribed individually by negotiating with them. Such e-Resources are subscribed annually and renewed every year.

**Table-7: Access method through which accessing e-Resources**

Institute	UTP Connection	WiFi
NIT Warangal	Yes	Yes
NIT Durgapur	Yes	Yes
VNIT Nagpur	Yes	Yes
NIT Srinagar	Yes	Yes
NIT Karnataka	Yes	Yes

MNNIT Allahabad	Yes	Yes
NIT Rourkela	Yes	Yes
SVNIT Surat	Yes	Yes
MANIT Bhopal	Yes	Yes
MNIT Jaipur	Yes	Yes
NIT Kurukshetra	Yes	Yes
NIT Tiruchirappalli	Yes	Yes
NIT Silchar	Yes	Yes
NIT Hamirpur	Yes	Yes
NIT Jalandhar	Yes	Yes

There are different methods for accessing Digital Libraries—users in NIT Libraries access e-Resources and Digital Library by UTP Connection and through WiFi. As Shown in table-7, both types of connectivity remain available in the libraries, and users use the connections at their convenience.

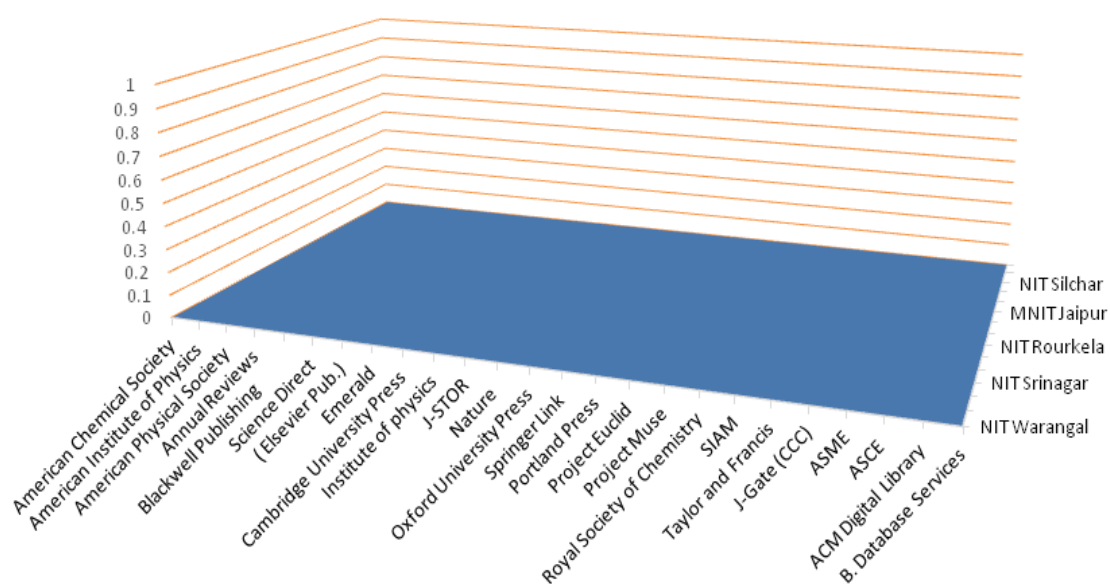


Figure-7: e-Resources accessed by Research Scholars

In India, all the NITs subscribe to several e-Resources for their Research Scholars and users. They get sufficient funds to subscribe to the expensive e-Resources for the users. The survey of the selected 15 NITs was done, and the reply received from them is shown in figure-7.

According to that, almost all the required e Resources had been procured for the research scholars. These are:

A.--American Chemical Society, American Institute of Physics, American Physical Society, Annual Reviews, Blackwell Publishing, Science Direct (Elsevier Pub.), Emerald, Cambridge University Press, Institute of Physics, J-STOR, Oxford University Press, Springer Link, Project Muse, Royal Society of Chemistry, Taylor and Francis, J-Gate (CCC), ASME, ASCE, ACM Digital Library, B.-- Database Services.

It is also essential that e-Resources be recommended by subject experts and concerned Academic and Professional Persons like Faculty members, Heads of departments, Deans, and Research Scholars pursuing Ph.D. and Research Projects. In the present survey, as the libraries of selected 15 NITs, a question was asked to the Librarians, and the answers of all the NITs were almost the same. They were given different options: Faculty Members, the Head of the department, Technical Staff of labs, and Students (PG and Ph.D.). It is a good practice that they have involved Research Scholars/ Ph.D. and PG students in selecting the e-Resources.

**5. Conclusion:** Advancement in Research education is considered as an important segment of the nation's development. Keeping the research education and usage of e Resources in view, a study was done among selective NITs of India. There are various e Resources (e journals, e Books, databases), which are very much supportive to the research studies. For this library survey of 15 selective NIT Libraries was done. As per the responses received and available various sources of information, it has been found that these libraries are well equipped with required infrastructure and all technical e Resources, which have been recommended by the learned faculty members, heads of the departments and the Research Scholars from different subject areas. These libraries are having Different software like Operating systems, integrated Library management software, plagiarism checking software, Remote Access etc., which are very useful in research studies. As per the survey done , these 15 Libraries of selective NITs are having all advance facilities ( including networking, Wifi, etc.), devices, infrastructure etc. for the Research Scholars and other users using the library and accessing e Resources.

#### References:

1. Academic Library, The importance of engineering in the modern world <https://www.studyinternational.com/news/importance-engineering-modern-world/>
2. "Engineering education in India" *Wikipedia* [https://en.wikipedia.org/wiki/Engineering\\_education\\_in\\_India](https://en.wikipedia.org/wiki/Engineering_education_in_India)
3. Padval, B. S. "E-Resources: Definition, Need, and Types." *International Journal of Scientific Development and Research* 7.5(2022): 291-293.
4. Khairnar, J. M. and Malavi, U. "E-Resources: Need, Types, Forms, and Utility." *International Journal for Research in Engineering Application & Management* 2018: CTRD2018002.
5. Bhardwaj T and Sharma S. "Use of Electronic Information Resources in Libraries." *Research and Reviews: Journal of Social Sciences* 8.2(2022): 23-42.
6. Kumari et al. "Usability of e-Resources among library & information science students in Patna, Bihar: a study." *Library Philosophy and Practice (e-journal) University of Nebraska – Lincoln* 6976, (2022).
7. Miranda J, et al. "Use of Electronic Resources by Postgraduate Users in Kenyan Selected Academic Libraries." *Journal of Information Sciences and Computing Technologies* 10.1(2022): 1-12.
8. Panneerdas, C. et al. "Utilization of E-Resources by Faculty Members and Students in Management Institutions, Coimbatore: A Study." *Library Philosophy and Practice (e-*

- journal) *University of Nebraska – Lincoln* 6802, (2022).
9. Jamuna, K. and M Dhanamjaya "Impact and Usage of E-Resources: A Literature Review." *Library Philosophy and Practice* (e-journal), 2021: 6735.
  10. Kumar M. A. and M Anjaiah "Use of Electronic Information Resources in Government Engineering College Libraries in Telangana State: A Study." *Library Philosophy and Practice* (e-journal) 5321. (2021).
  11. Moustapha, A. "Utilization of Electronic Resources by Library Users In Kwara State University, Nigeria." *International Journal of Scientific & Engineering Research*. 12.3 (2021).
  12. Mukh, M and Rajneesh "Information e-Resources for generation 'z': An initiative by the Government of India." *International Journal of Library & Information Science* 10.1 (2021): 1-7.
  13. Sahu, R. and B Tiwari "Usage Pattern of Electronic Resources among Undergraduate Students of Selected Constituent Colleges of Indira Gandhi Krishi Vishwavidyalaya, Raipur: A Case Study." *Library Waves* 7.2 (2021): 71-78.
  14. Singh, M. P. and B V Shukla (2021) "Utilization of Electronic Resources by the Faculty Members of Select Private Universities of NCR Region during the Covid-19 Pandemic: A Trend Analysis." *Turkish Online Journal of Qualitative Inquiry* 12.10 (2021): 403-415.
  15. Shibin, S.B. Digital Library as a Learning Hub: A Survey among National Institute of Technology Research Scholars, Calicut. "Journal of Information Management.7.2020:32-45.
  16. Shukla, R. Impact of e-Resources among the Research Scholars of the Faculty of Social Science and the Department of Education of the University of Jammu, Jammu: A Case Study. "Library Philosophy and Practice".2020.
  17. Dada, G. A. and O. R. Eghworo "Undergraduates' Awareness, Accessibility and Use of Electronic Information Resources (EIRs) in Federal Universities in South West, Nigeria." *Library Progress* 40.2(2020): 336-347.
  18. Joshua, D. and K. King "The Utilization of E-Resources at Modibbo Adama University of Technology (MAUTech), Yola, Adamawa State, Nigeria." *International Journal of Knowledge Content Development & Technology* 10.1(2020): 47-70.
  19. Salman, A. A. et al. "Availability, Accessibility, and Use of Electronic Information Resources among Undergraduate Students in Fountain University Library, Osogbo" *Journal of Library and Information Sciences* 8.1(2020):100-110.
  20. Sahu, S. K., and S. Singh "Impact of E-Resources on Higher Learning: a study" *Conference: 9th ILIPS-2020: Academic Libraries: latest trends, challenges and opportunities* (2020)
  21. Ajibona, H. F. et al. "Library Services Provision On Academic Performance Of Nursing Undergraduates In Selected Universities In South-West Nigeria" *Library Philosophy and Practice* (e-journal) (2019).
  22. Ajie, I. "Professional Branding of an Information Professional through ICT for Effective Service Delivery" *Library Philosophy and Practice* (e-journal) (2019).