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Optimizing Electronic Resources and Usage: A Study of Guru Nanak Dev University, Amritsar

HARISH CHANDER*

SATWINDERPAL KAUR GILL**

RAJINDER KUMAR***

There is an emergent trend of transferring conventional print items into digital versions. Libraries are presently augmenting inimitable items to their holdings as an outcome of the development of the latest state-of-the art technology. E-resources, or electronic resources, which include a broad spectrum of themes and issues which enables thorough access to the collected knowledge and information. Accessing has currently become far easier, faster and more convenient mainly due to the emerging development of digital technologies. E-resources, or electronic digital information sources, are vital to the academic community's quest for knowledge and investigation. This study demonstrates the manner in which the staff and students of Guru Nanak Dev University use technological resources to the maximum. It displays a scrutiny of electronic resources that have been subscribed through INFLIBNET and E-Resource vendors. The results of the study will assist in the comprehension of the need of users' information and empower university authorities and decision-makers plan, subscribe to, or acquisition of the most pertinent e-resources for the research and academic communities.

Keywords: *Electronic resources, Usage of electronic resources, E-Resources, INFLIBNET, Guru Nanak Dev University (GNDU).*

0 INTRODUCTION

The emergence of the Internet has directed towards an unprecedented

* Assistant Professor, Department of Library and Information Science, Guru Nanak Dev University, Amritsar-143005, Email: harish.libsc@gndu.ac.in

** Assistant Professor, Department of Library and Information Science, Guru Nanak Dev University, Amritsar-143005, Email: satwinderpal.libsc@gndu.ac.in

*** Research Scholar, Department of Library and Information Science, Guru Nanak Dev University, Amritsar-143005 Email: dadhwalrj@gmail.com

outburst in the utilization of electronic resources (e-resources) for forays in the field of research and development in recent years, substantially surpassing the diminishing usage of the outdated print resources. Digital documents offer the advantage of direct access to information from the host computer, eliminating the need for transitional mediums.¹ The profound impact of technology on all facets of academic life and research is evident in the present day's rapidly advancing world. While higher education institutions in developed nations recognize the prolific opportunities presented by the technological advancements to impeccably integrate innovations within the teaching-learning environment, developing countries are striving to enhance their learning experiences and remain equally competitive in this digital landscape.²

Contemporary academic libraries are intricate establishments that encompass diverse roles, a multitude of operational tasks, and an array of services that have evolved over time. However, their fundamental objective has persisted – facilitating access to reliable and influential knowledge. As a result, the academic libraries, along with their private and governmental counterparts, have long maintained an unchallenged position worldwide as the primary purveyors of recorded knowledge and historical information, particularly within the realm of higher education.

1 E-RESOURCES: MEANING AND CONCEPT

E-resources, termed in short for electronic resources, refer to the vast array of materials accessible in digital format, including e-books, e-journals, databases, websites, and other multimedia content. These resources have become increasingly prevalent in the academic and research settings, offering a plethora of numerous benefits over the conventional print materials. One of the primary benefits of e-resources is their accessibility. The users have the convenience to access these resources remotely, anytime and from anywhere, as long as they have an internet connection.³ This expediency has been predominantly valuable during the COVID-19 pandemic, enabling researchers and students to continue their work from home.⁴ E-resources also offer enhanced search capabilities and the aptitude to manipulate and analyze data more efficiently.⁵ Some of the advantages include full-text searching, keyword searching, and advanced filtering options which make it easier to locate relevant information rapidly.

Moreover, e-resources have proved to be more cost-effective for libraries and institutions as compared to the print materials, as they eliminate the need for physical storage space and reduce maintenance costs. Additionally, there are several e-resources that are available through subscription models, allowing multiple users to access the same content simultaneously. There is hardly any doubt that there are challenges related with e-resources, such as, potential

access issues, compatibility concerns and the requirement for appropriate licensing and copyright management. Libraries and institutions need to ensure that they have the requisite infrastructure and policies in place to effectively manage and provide access to these resources. With the continuous advancements in technology and the increasing demand for digital content, e-resources have become an integral part of modern libraries and research institutions. Librarians and information professionals play a decisive role in selecting, organizing, and promoting these resources to support the diverse needs of their user communities.

E-resources can be categorized into various types, on the basis of their content, format, and purpose, such as, e-books, e-journals, databases, e-newspapers and e-magazines, online reference works, multimedia resources, e-theses and dissertations, open access resources, online course materials, institutional repositories, digital archives and data repositories.⁶

2 LITERATURE REVIEW

The trend of using e-resources has been steadily increasing, with a shift towards digital resources over traditional print media. E-Resources play a vital role in supporting teaching and research activities in academic institutions and now considered essential tools for academic and research communities.⁷

Customized access and support systems augment the user experience and promote greater utilization of e-resources. Academic libraries are increasingly adopting a user-centric approach to provide tailored e-resource services that meet the diverse needs of their users.⁸

The utilization of E-Resources in academic libraries has significantly transformed the panorama of information access and scholarly activities. Academic staff, researchers, and students are heavily dependent on the electronic resources, such as, e-books, e-journals, e-theses, and e-databases for their teaching, learning, and research endeavors.⁹

The institution's research and development efforts have transferred in recent years to concentrate heavily on electronic instructional resources. A collection of information gathered using electronic means, such as, the Internet, is called an e-Library. Electronic resources have a larger role to play in the students' education due to their availability and accessibility over the Internet. In order to successfully accomplish their mission of giving students current, relevant knowledge and skills, engineering education institutions first examine how students use electronic resources and conduct online information searches.¹⁰

According to Viswanathan and Sasireka¹¹, using e-resources has a significant influence on higher education. Since there are plenty of electronic resources available, the information requirements are met. Although e-resources

are seen favorably, there are several issues with their usage. A total lack of computer expertise prevents users from using e-resources to its full extent and publishers from limiting access. Kebede¹² discovered that while a majority of the libraries had internet access, relatively a few of them provided web-based information services to their patrons following a survey of ten African public libraries. Nevertheless, the study finds some obstacles to the efficient delivery of electronic resources in those libraries.

The pattern of the library at IIM Kozhikode regarding usage of e-resources statistics was observed by Sunitha¹³, which also draws the attention of information professionals on the quite a lot of prospects in the usage of e-resources by the libraries and information centers. Veer and Panda¹⁴ conducted a survey on student and faculty of Chandigarh University library to assess the e-resource usage statistics during the pandemic lockdown period and found that a large number of users were aware regarding e-resources available in the library and use them efficiently as per their requirements. Senthil and Maniarsan¹⁵ studied the awareness and perception of users of electronic resources such as e-journals, e-books, indexing and abstracting, review and databases provided by Bharathidasan University and Madurai Kamaraj University.

The results indicated that the impact of e-resources increasing and a majority of respondents had an excellent awareness and were satisfied with the use of electronic resources.

3 OBJECTIVES

- To identify the e-resources subscribed by Bhai Gurdas Library, central library of Guru Nanak Dev University.
- To know the usage pattern of e-resources subscribed through commercial vendors and INFLIBNET.
- To analyze high-demand e-resources, such as SpringerLink, JSTOR, and Taylor and Francis, IEEE, JGate Plus, SCOPUS, Web of Science.
- To analyze the usage patterns of individual databases to identify the most relevant e-resources.
- To utilize the observed information to make decisions about acquiring or renewing subject-specific e-book and e-textbook collections.

4 METHODOLOGY

The data regarding the usage statistics of e-resources were acquired from the website of Bhai Gurdas Library, a central library of Guru Nanak Dev University, Amritsar, INFLIBNET centre and online commercial vendors/publishers to observe user's preferences for the desired source of digital information. The data of e-resources' usage recorded from the years 2019 to 2023, of five years which include COVID -19 pandemic period also. The

collected data was analyzed through the assistance of MS-Excel to present it in a tabular and graphical format.

5 ANALYSIS AND DISCUSSION

E-RESOURCES AT BHAI GURDAS LIBRARY, GURU NANAK DEV UNIVERSITY

The Bhai Gurdas Library, Guru Nanak Dev University is the hub of academic resources that plays a critical role in enriching the educational experience at the university. With a vast assemblage of e-journals, e-books, and databases, the library offers a comprehensive range of electronic resources to support research and learning across various disciplines. Some of the noteworthy events, such as, expositions of rare books, manuscripts, and photographs, along with seminars and workshops on e-resources, reflect the library's commitment to endorsing an awareness and utilization of these valuable assets. The institutions like INFLIBNET have contributed to augmenting the appreciation and accessibility of e-resources at the library. The Table-1 defines that in order to facilitate and enhance the educational pursuits, including teaching, learning, and research endeavors undertaken within the university campus, the institution's library maintains subscriptions to a diverse array of databases.

TABLE-1

51 E-Resources Subscribed by GNDU Library

S. No.	E-Resources subscribed through INFLIBNET	Databases Subscribed through INFLIBNET	E-Resources subscribed through vendor	E-Books Subscribed Through Vendors
1	American Chemical Society	Institute for Studies in Industrial Development (ISID) Database	Scopus	Cambridge University Press
2	American Institute of Physics	JGate Plus (JCCC)	Science Direct	Elsevier
3	Annual Reviews	MathSciNet	Scifinder	Springer Nature
4	American Physical Society (APS)	Web of Science	Wiley	Sage Publications
5	Institute of Physics	-	RSC	Oxford University Press
6	JSTOR	-	IEEE	Taylor and Francis
8	Oxford University Press	-	Theime (Synthesis)	-
9	Project Muse	-	-	-
10	Society of Indian Automobile Manufacturers (SIAM)	-	-	-
11	Springer Link	-	-	-
12	Taylor and Francis	-	-	-

(Source: <https://library.gndu.ac.in/>)

USAGE STATISTICS OF E-RESOURCES SUBSCRIBED VIA COMMERCIAL VENDOR DURING 2019 TO 2023

The Table-2 offers the usage of statistics of various e-resources subscribed by the Central Library of Guru Nanak Dev University through commercial vendors from 2019 to 2023 which covers Scopus, Science Direct, Scifinder, Wiley, RSC, IEEE, and Theime (Synthesis).

TABLE-2

52 Usage Statistics of E-resources Subscribed via Commercial Vendor

S. No.	E-Resources	2019	2020	2021	2022	2023	Total
1	Scopus	12173	15517	12546	18498	19122	77856
2	Science Direct	73207	78444	88091	116590	1152229	1508561
3	Scifinder	10072	20890	2291	1785	-	35038
4	Wiley	6302	10625	18951	27103	26242	89223
5	RSC	7257	3753	983	13071	14312	39376
6	IEEE	2426	758	1378	2049	2285	8896
7	Theime (Synthesis)	465	341	713	759	-	2278
	Total	111902	130328	124953	179855	1214190	1761228

It discovered that Science Direct has the highest total usage of 1,508,561 over the five-year period, with a significant increase in 2023 (1,152,229 usages). Scopus and Wiley also have substantial usage, with 77,856 and 89,223 total usage, respectively. RSC and IEEE have moderate usage, with 39,376 and 8,896 total usages, respectively. Scifinder and Theime (Synthesis) both have relatively lower usage compared to other resources.

The overall usage across all e-resources increased from 111,902 in 2019 to 1,214,190 in 2023, indicating a growing demand and utilization of e-resources over time. Science Direct and Wiley consistently recorded an extremely high usage across all years, with Science Direct showing a remarkable surge in 2023. Scifinder had a significant upsurge in usage in 2021 (22,291) compared to other years.

USAGE STATISTICS OF E-RESOURCES SUBSCRIBED VIA INFLIBNET DURING 2019 TO 2023

Table-3 indicates the usage statistics for various electronic resources subscribed through INFLIBNET (Information and Library Network Centre) from 2019 to 2023.

TABLE-3*53 Usage Statistics of E-Resources Subscribed via INFLIBNET*

S. No	E-Resources	2019	2020	2021	2022	2023	Total
1.	American Chemical Society	26943	12918	20187	2734	1	62783
2.	American Institute of Physics	4057	829	2153	1902	541	9482
3.	Annual Reviews	558	253	537	753	663	2764
4.	APS	-	626	1310	2069	854	4859
5.	Institute of Physics	-	57	13	1	-	71
6.	JSTOR	7406	5795	7263	9212	12169	41845
7.	Oxford University Press	3906	2257	3586	1118	1205	12072
8.	Project Muse	540	87	139	184	240	1190
9.	SIAM	1	-	1	-	-	2
10.	Springer Link	-	18963	33549	52336	57775	162623
11.	Taylor and Francis	1609	5257	8080	14466	14538	43950
	Total	45020	47042	76818	84775	87986	341641

The Table-3 depicts 11 different e-resource providers, including publishers such as American Chemical Society, American Institute of Physics, Annual Reviews, Oxford University Press, and aggregators like JSTOR, Project Muse, and SpringerLink. The e-resource with the highest total usage during the given period is SpringerLink, with 162,623 usages, followed by JSTOR (41,845 usages), Taylor and Francis (43,950 usages), and American Chemical Society (62,783 usages). The total usage across all e-resources has shown a steady increase from 45,020 in 2019 to 87,986 in 2023, representing a mounting demand for electronic resources among users. The year 2022 saw a significant jump in usage for many e-resources, such as, SpringerLink (52,336), Taylor and Francis (14,466), and JSTOR (9,212), possibly due to increased remote access requirements during the COVID-19 pandemic.

USAGE STATISTICS OF E-BOOKS/E-TEXTBOOKS SUBSCRIBED VIA COMMERCIAL VENDORS DURING 2019 TO 2023

Table-4 highlights the usage statistics of various e-books and e-textbooks subscribed by Guru Nanak Dev University (GNDU) library from 2019 to 2023.

TABLE-4*54 Usage Statistics of E-books/e-textbooks Subscribed via Commercial Vendor*

S. No.	Database	2019	2020	2021	2022	2023	Total
1	Cambridge University Press	-	-	-	63168	90078	153246
2	Elsevier	-	2251	3578	264	208	6301
3	Springer Nature	-	867	1802	3277	4065	10011
4	Sage Publications	-	-	-	-	2222	2222
5	Oxford University Press	-	-	-	5817	12965	18782
6	Taylor and Francis	-	1635	129368	12886	10598	154487
	Total	-	4753	134748	85412	120136	345049

The Table-4 explores that the total usage across all commercial databases from 2019 to 2023 is 345,049 views/downloads. The E-book/e-textbook subscriptions started from 2020/onwards. It is observed that Taylor and Francis had the highest overall usage with 154,487 views/downloads, followed by Cambridge University Press with 153,246 views/downloads. Elsevier and Sage Publications had comparatively lower usage, with 6,301 and 2,222 views/downloads, respectively. Springer Nature and Oxford University Press had moderate usage, with 10,011 and 18,782 views/downloads, respectively.

The year 2021 witnessed a significant upsurge in the usage, with a total number of 134,748 views/downloads, primarily driven by Taylor and Francis. In 2022, the total usage was 85,412 views/downloads, with Cambridge University Press contributing the highest share. The data for 2023 shows a total of 120,136 views/downloads until the recorded period, with Cambridge University Press and Oxford University Press having the highest usage.

USAGE STATISTICS OF DATABASES SUBSCRIBED VIA INFLIBNET

Table-5 provides the usage statistics of various databases subscribed through INFLIBNET for the years 2019 to 2023.

TABLE-5

55 Usage Statistics o Database Subscribed via INFLIBNET

S. No	Databases	2019	2020	2021	2022	2023	Total
1	Institute for Studies in Industrial Development (ISID) Database	-	-	-	-	-	-
2	JGate Plus (JCCC)	6735	3385	3343	2790	2179	18432
3	MathSciNet	350	311	717	938	370	2686
4	Web of Science	-	1197	1925	4589	3243	10954
	Total	7085	4893	5985	8317	5792	32072

It is discovered from the analysis that JGate Plus (JCCC) has the highest usage across all years, with a total of 18,432 accesses. However, the usage has been declining over the years, from 6,735 in 2019 to 2,179 in 2023. The Web of Science has experienced a steady increase in its usage from 2020 onwards with an increased usage to 4,589 in 2022 and 3,243 in 2023. MathSciNet database usage fluctuated over the years as highest in 2022 with 938 accesses but dropped to 370 in 2023.

6 CONCLUSION

In conclusion, the analysis highlights the importance of regularly monitoring and assessing e-resource usage data to reach informed decisions about subscription renewals, cancellations, or additions. The total usage across all databases increased from 7,085 in 2019 to 8,317 in 2022. The upward trend in the usage of e-resources at GNDU, with Science Direct being the most

heavily utilized resource, especially in the most recent year (2023). The usage data indicates a growing trend in the adoption and utilization of e-books and e-textbooks by GNDU users over the years. Taylor and Francis and Cambridge University Press appear to be the most popular and extensively used resources among the subscribed databases. The JGate Plus (JCCC) had the highest overall usage. The Web of Science has perceived a steady increase in recent years. By aligning e-resource subscriptions with user demands and optimizing resource allocation, the institution can effectively support the research and academic needs of its user community while maximizing the return on investment.

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