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DIGITAL SEARCH DEFICIENCIES, INSTITUTIONAL INFRASTRUCTURE, AND ELECTRONIC RESOURCE UTILIZATION AMONG POSTGRADUATE STUDENTS IN SELECTYED UNIVERSITIES, SOUTH-SOUTH, NIGERIA

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Abstract

This study investigated how postgraduate students at public universities in South-South Nigeria search for information digitally and how this affects the use of electronic information resources (EIR). The design employed was descriptive research. The study population was 1,250 postgraduate students at Delta State University (DELSU), Niger Delta University (NDU) and Rivers State University (RSU) selected purposefully. From the population, a sample of 303 was determined using the Taro Yamane formula. The Digital Search Deficiencies, Institutional Infrastructure, and Electronic Resource Utilization Questionnaire (DSDIIERUQ) was utilized to collect data. Of the 303 questionnaires administered, 291 were retrieved after completion, and were analyzed. Data analysis was done using descriptive statistics. The study revealed that postgraduate students encountered a number of problems in digital searching due to poor selection of keywords, inability to understand Boolean operators, and ineffective use of search filters. The study further revealed that the utilization of electronic resources was a result of poor infrastructures and irregular power supply, in addition to having a constrained campus network and inadequate remote access to resources. From the results of Pearson correlation, a negative and significant relationship between digital search deficiencies, and EIR utilization was observed ($r = -0.582$, $p < 0.05$). Positive and significant relationship between institutional infrastructure and EIR utilization was also observed ($r = 0.714$, $p < 0.05$). Based on the study findings, it was recommended that public universities in South-South Nigeria design bonding courses on search literacy for all newly admitted

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postgraduate students, and develop solar powered institutional networks to serve the university information resource needs.

Keywords: Digital Search Deficiencies, Institutional Infrastructure, Electronic Information Resources (EIRs), Utilization, Postgraduate Research, South-South Nigeria.

Introduction

Today's academic research on Electronic Information Resources (EIRs) is heavily reliant upon subscription-based databases, such as ScienceDirect, Scopus, JSTOR, and Emerald Insight. The reliance of traditional literature on print media has greatly reduced (Tiamiyu & Ajibola, 2023). Information that is shared over computer networks can be regarded as electronic information. Changing formats of printed resources become electronic resources. Examples of these resources are books and articles in electronic format, bibliographic databases, full-text databases, collections of digital data, and institutional digital stores. Kumbar (2021) adds that EIRs comprise of materials accessed through electronic devices or through computer networks such as e-books, e-journals, online public access catalogs (OPACs), and electronic data.

The adoption of EIRs has had a tremendous impact on the services of academic libraries. Effective management and use of electronic resources requires an appropriate selection, timely renewal of licenses, and the implementation of usage controls within the context of the needs of the organisation (Wada, Okwoli & Ofodu, 2023).

Access to EIRs does not guarantee effective use. The ability to search and retrieve information is a major factor that determines how researchers engage with electronic resources. In an academic context, digital literacy consists of searching skillfully and using

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search keywords appropriately, applying search operators, implementing information filters, and assessing the outputs of a search. In South-South Nigeria's universities, though postgraduate students are reported comfortably using the internet and social media, they still lack effectiveness in getting around academic databases and conducting quality literature searches.

Okite-Amughoro, Makgahlela & Bopapa (2014) opined that some postgraduate researchers at Delta State University may lack the necessary ICT skills to conduct appropriate academic database searches. Some of these researchers may not be familiar with the use of Boolean operators, the use of truncation, wildcard characters, and the art of searching specific fields, among others.

The use of electronic resources is affected by more than just the ICT skills of the researcher. Researcher should have access to adequate electricity and internet if electronic resources are to be accessed and utilized. Etebu & Zacchaeus (2022) noted that the digital library services at some South-South Nigeria universities suffer from lack of both adequate and stable power and internet. To run their ICT services, campuses in most cases are forced to use generators, while some endorse alternative energy sources. Etebu & Dime (2020) studies of Niger Delta University identified irregular power supply and poor internet as the main impediments to the use of digital library services.

Insufficient searching abilities and lack of infrastructure cause low usage of electronic sources. This is the core dependent variable in the research. Although postgraduate students can identify resources such as the NUC Virtual Library, AGORA,

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HINARI, and EBSCOhost, it does not mean that they utilize them often, let alone effectively. Slow Internet, no electricity, no available workstations, and insufficient search skills are some of the reasons people do not use these resources. The evidence from Rivers State University also supports this, with Tella, Oyeniran & Ibironke (2023) reporting a positive relationship between students' digital literacy and their effective use of electronic resources. Which shows that the search infrastructure of electronic resources and postgraduate students' search skills need improvement.

Electronic information resources (EIRs) offer postgraduate students an opportunity to access the latest developments and research in different regions of the world and different fields of study as well as an opportunity to close the resource gap (Ekene et al., 2024). In light of this, Nigerian government-owned universities have invested in digitization of library services and the subscription of electronic resources, as well as the provision of electronic libraries (Ilogho & Nkiko, 2023).

There are numerous EIRs in most state universities in the South-South region of Nigeria, but they have not been maximized. Although some state universities provide electronic libraries together with databases, their use by postgraduate students is very limited (Oghenetega et al., 2022). Many postgraduate students do not use the relevant databases, and instead rely on popular search engines, like Google, or on Wikipedia and other open sources to find their research materials (Oyeniyi, 2026). This practice, along with many others like it, may produce low quality research and running the risk of using

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research materials that are untrustworthy and relying on predatory publishing (Chinwe & Ugwu, 2023).

This problem has several user related and systemic factors that combine to inhibit the use of these resources. From a user standpoint, some postgraduate students have neither the skills nor the experience required to conduct effective searches of special databases (Ebiye, 2026). Several systemic factors include erratic power supply, insufficient or unreliable internet, malfunctioning computer terminals, and broken remote access systems (Nneka & Oche, 2024; Obasuyi & Osagie, 2026).

The availability of resources does not ensure that those resources are being utilized. Students must be able to search for information, and the environment that informational resources are provided in must also be considered. This study is concerned with the digital search deficiencies and the institutional infrastructure of postgraduate studies at Delta State University, as well as the Niger Delta University and Rivers State University.

Statement of the Problem

University libraries in South-South Nigeria spend a great deal of money on buying e-resources in order to provide postgraduate students with the opportunity to access global scholarship and enhance local research. These investments, however, may be wasted, because the resources are underused. This use is reported to be the case for the academic databases for which the universities have paid subscription fees. This may be a case of wasteful use of funds, and may also lead to substandard and noncompetitive research at the postgraduate level in universities of Nigeria.

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Postgraduate students that struggle to develop good search queries, use the filters in databases, or navigate systems will be limited in their search for scholarship. When combined with recurrent power outages, slow internet connectivity, and long, complicated authentication processes, students will likely prefer to use general search engines that will provide them with the information they need, rather than the scholarly resources provided by the university.

Digital literacy and the availability of technological resources have often been studied separately. There is very little research that covers the implications of search limitations and technological resource limitations that occur at the same time when postgraduate students are searching for information. This research fills that gap for the students at Delta State University, Niger Delta University, and Rivers State University.

Research Questions

The following research questions guided the study:

1. What is the level of digital search deficiencies among postgraduate students in DELSU, NDU, and RSU?
2. What is the status of institutional infrastructure supporting electronic resource access in these selected universities?
3. What is the extent of electronic resource utilization among postgraduate students in the study areas?

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4. What is the relationship between digital search deficiencies and electronic resource utilization?
5. What is the relationship between institutional infrastructure and electronic resource utilization?

Literature Review

Level of Digital Search Deficiencies among Postgraduate Students

Akpojotor (2017) noted that Postgraduate students in Nigerian universities frequently encounter notable digital literacy gaps and search deficiencies when navigating complex electronic databases. Ashcroft (2011) went on to say that while graduate students are generally confident with basic computer operations, many lack advanced Boolean logic, truncation, and subject-heading search skills required for high-level academic research. Research conducted at Delta State University, Abraka (DELSU) by Okite-Amughoro, Makgahlela & Bopape (2014) indicates that a substantial proportion of students rely heavily on generic search engines rather than specialized academic repositories like ERIC or ScienceDirect due to inadequate search proficiency. Similar knowledge gaps are mirrored across regional institutions including Niger Delta University (NDU) and Rivers State University (RSU), where students experience difficulties formulating precise search strings, leading to information overload or retrieval of irrelevant sources (Ashcroft (2011); Edem & Egbe (2016); Ikenwe (2024)).

Furthermore, (Akpojotor (2017) averred that deficiency studies emphasize that one-off library orientations fail to build durable search competencies. Many postgraduates

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exhibit an operational phobia or apathy toward advanced information retrieval systems, stemming from poor foundational computer education during their undergraduate years. Consequently, search strategies remain superficial, directly constraining the quality of literature reviews embedded in theses and dissertations (Ashcroft (2011).

Status of Institutional Infrastructure Supporting Electronic Resource Access

The state of ICT and library infrastructure in public universities across South-South Nigeria remains critically constrained (Akpojotor (2017). Empirical assessments reveal that institutional infrastructure—comprising stable internet bandwidth, functional computer laboratories, reliable electric power, and subscribed online databases—is frequently sub-optimal. Facilities at universities such as DELSU, NDU, and RSU suffer from persistent challenges including erratic and epileptic power supplies, obsolete hardware, and slow, congested campus Wi-Fi networks (Okite-Amughoro et al (2014); Aschroft (2011); Okoro & Ejemhian (2025).

Libraries in these institutions often provide a limited range of electronic information resources (EIRs), predominantly restricted to basic e-journals and e-books, while specialized e-conference proceedings, e-data archives, and multi-disciplinary index databases are sparsely available or entirely absent (Akpojotor, 2017). Budgetary constraints within state-owned Nigerian universities further impair the continuous renewal of annual database subscriptions, leaving institutional repositories under-equipped to support modern digital scholarship (Ndubuisi & Udo (2013).

Extent of Electronic Resource Utilization among Postgraduate Students

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Despite the acknowledged academic advantages of electronic information resources, such as remote accessibility, multi-user capability, and up-to-date content, empirical findings such as consistently report a low-to-moderate extent of utilization among postgraduate students. Utilization patterns skew heavily toward familiar, general-purpose resources like open-access portals (e.g., AJOL) and generic internet search tools, whereas specialized research tools and deep-web databases experience minimal engagement (Okite-Amughoro et al (2014).

Relationship between Digital Search Deficiencies and Electronic Resource Utilization

Akuffo & Budu (2019) noted that the immediate outcome of deficient digital search skills is a sharp decline in the volume and quality of e-resource utilization. When researchers repeatedly encounter zero-result pages or thousands of irrelevant documents due to poor query parameters, they experience cognitive frustration and search anxiety. This psychological friction causes them to abandon premium institutional repositories entirely. Consequently, deficiencies in navigating formal library portals drive researchers toward open-access, unstructured, or general search platforms like Google Scholar and Wikipedia. Oyedapo & Ojo (2013) averred that while these platforms are useful, relying on them exclusively means students miss out on specialized, high-impact, paywalled institutional subscriptions, resulting in an expensive waste of university licensing budgets.

The relationship between search deficiencies and low utilization underscores the fact that the mere physical or digital availability of resources does not guarantee their use. Librarians and researchers argue that higher education institutions must shift from simple

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resource orientation, which merely shows students that a database exists, to active information literacy programs integrated into the academic curriculum (Ani & Edem, 2019). Continuous training focusing explicitly on advanced retrieval techniques, citation tracking, and database indexing taxonomies is statistically proven to bridge the utilization gap. When universities provide formal information communication technology (ICT) and database training, users exhibit significantly higher confidence, search precision, and frequency of e-resource engagement (Ojo & Akande, 2021). Ultimately, the optimization of electronic resources relies heavily on resolving these cognitive search deficiencies through deliberate, structured institutional interventions.

Relationship between Institutional Infrastructure and Electronic Resource Utilization

Eiriemiokhale (2023) conducted a study spanning state-owned universities in Nigeria—including Ondo State University of Medical Sciences, Chukwuemeka Odumegwu Ojukwu University, and Delta State University—and identified erratic power supply as the single most critical structural impediment forcing low e-resource engagement. Without institutional investments in heavy-duty backup generators, solar grids, or inverter systems, digital labs become non-functional during power outages. Furthermore, insufficient bandwidth and persistent server slowness heavily deter users. Obasola and Adetimirin (2026) indicate that slow network connectivity and the high cost of alternative, personal data plans force postgraduate students at institutions like the University of Ibadan to rely

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almost exclusively on basic internet browsing rather than exploiting advanced, subscription-based library databases.

The structural mechanisms governing how a library validates its users are also highly deterministic of student research patterns. Modern academic work is no longer confined to physical campus boundaries, yet many Nigerian universities lack comprehensive off-campus proxy access (Etebu & Dime, 2020). Edem & Egbe (2016) averred that because many postgraduate students in Nigeria balance working professional lives with their studies, an institutional infrastructure that mandates their presence at a physical campus workstation to browse subscribed databases drastically curtails usage rates. When universities fail to maintain institutional subscriptions or provide uniform login credentials, postgraduates experience credential friction. Oluwaseun (2024) notes that this lack of streamlined access channels drives students away from official e-libraries toward public search options like Google Scholar, which limits their access to high-impact, paywalled empirical data.

Methodology

In order to explore the linkages between abilities of the students, infrastructure, and resource usage without any intervention, the present study adopted a descriptive survey research approach. The target population consisted of 1,250 master's and doctoral students who were enrolled during the 2025–2026 academic session at three state universities in the South-South part of Nigeria, namely Delta State University, Abraka (DELSU), Niger Delta University, Wilberforce Island (NDU), and Rivers State University,

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Port Harcourt (RSU). Multi-stage sampling was used for the selection of samples. The first stage involved the use of purposive sampling of three state universities.

In the research process, the primary tool for data gathering is the Digital Search Deficiencies, Institutional Infrastructure, and Electronic Resource Utilization Questionnaire (DSDIIERUQ). The questionnaire has four divisions and used a 4-point Likert Scale: Strongly Agree (SA = 4), Agree (A = 3), Disagree (D = 2), and Strongly Disagree (SD = 1).

To prove the validity of the instrument, two experts from the faculty of Information Science in Delta State University reviewed it. On the other hand, its reliability was established using the pilot study conducted among 30 postgraduate students of the University of Uyo. From the pilot study, Cronbach's Alpha Coefficients of 0.84 and 0.81 were obtained from the digital search deficiency items and institutional infrastructure items respectively.

Questionnaires were distributed in the selected universities with the aid of three research assistants in the library. Out of the 303 questionnaires distributed, 291 were collected. This made the response rate of 96.0%. The data were analyzed using Statistical Package for Social Sciences (SPSS) Version 27.0. Mean and Standard Deviation are used in the descriptive analysis, where mean score of 2.50 is the criterion for agreement. For testing of hypothesis, Pearson Product Moment Correlation is used with $p \leq 0.05$ level of significance.

Results and Discussion

Demographic Profile of Respondents

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Table 1: Institutional Distribution of Valid Sample

Institution	Target Sample Allocated	Retrieved Frequency (f)	Valid Percentage (%)
Delta State University (DELSU)	112	108	37.11%
Niger Delta University (NDU)	93	89	30.58%
Rivers State University (RSU)	98	94	32.31%
Total	303	291	100.00%

Table 1 shows the distribution of the 291 valid respondents across the participating universities.

Test of Research Questions

Research Question 1: What is the level of digital search deficiencies among postgraduate students in DELSU, NDU, and RSU?

Table 2: Mean and Standard Deviation Ratings for Digital Search Deficiencies

S/N	Item Statement	Mean ($\bar{X}$)	SD	Remark
1	I write full research questions as search phrases in databases rather than isolating core keywords.	3.24	0.74	High Deficiency
2	I do not know how to apply Boolean search operators (AND, OR, NOT) to refine my search results.	3.12	0.81	High Deficiency
3	I rarely use search limiters like publication year, document type, or geography to narrow down results.	2.89	0.85	High Deficiency
4	I find it difficult to distinguish between predatory open-access research sites and accredited citation databases.	2.76	0.79	High Deficiency
	Weighted Grand Aggregate	3.00	0.80	**High Deficiencies**

Source: field work 2026

With a weighted grand mean of 3.00, which is higher than the 2.50 threshold, Table 2 shows that postgraduate students have significant deficiencies in digital search. Writing

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whole sentences as search queries received the highest score ($\bar{X}$ = 3.24), followed by a score of 3.12 for unfamiliarity with Boolean operators. Evidence links student digital search ability and institutional e-infrastructure with the use of electronic information resources. For the first question, the evidence notes that students at the postgraduate level DELSU, NDU, and RSU, have considerable issues searching electronic databases. Respondents noted difficulties creating intelligent search queries and using Boolean logic and/or query refinements. This finding is in agreement with previous research that claimed while postgraduate students are generally comfortable using digital tools, there are deficits in their ability to perform advanced search activities of academic databasing (Ebiye, 2026; Oyeniyi, 2026).

Research Question 2: What is the status of institutional infrastructure supporting electronic resource access in these selected universities?

Table 3: Respondents' Assessment of Institutional Infrastructure Status

S/N	Item Statement	Mean ($\bar{X}$)	SD	Remark
1	Power outages occur frequently at the campus e-library, disrupting electronic database access.	3.45	0.62	Severe Constraint
2	The campus Wi-Fi/LAN network bandwidth is slow and fails during data downloads.	3.21	0.71	Severe Constraint
3	Remote (off-campus) authentication access to subscribed indices is complicated or unavailable.	3.10	0.78	Severe Constraint
4	Functional desktop terminal setups in the postgraduate computer room are insufficient.	2.68	0.89	Moderate Constraint
	Weighted Grand Aggregate	3.11	0.75	**Highly Inadequate**

Source: field work 2026

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With a high grand mean of 3.11, Table 3 demonstrates that institutional infrastructure presents a significant constraint. The main technical issues were determined to be inconsistent power supplies ($\bar{X}$ = 3.45) and slow campus network bandwidth ($\bar{X}$ = 3.21). For the second question, the evidence indicates that state owned universities in the South-South region of Nigeria, continue to battle with infrastructure, exemplified by inconsistent power and internet. This finding is consistent with the existing literature that note slow internet and power outages continue to exacerbate the creation of constant digital environments (Nneka & Oche, 2024; obasuyi & Osagie, 2026).

Research Question 3: What is the extent of electronic resource utilization among postgraduate students in the study areas?

Table 4: Extent of Electronic Resource Utilization among Students

S/N	Item Statement	Mean ($\bar{X}$)	SD	Remark
1	I access subscribed databases (e.g., ScienceDirect, Emerald) daily for research.	1.84	0.64	Low Extent
2	I use institutional open-access repositories to review past departmental dissertations.	2.12	0.70	Low Extent
3	I download peer-reviewed electronic journal papers provided through library links.	1.98	0.67	Low Extent
4	I prefer to use unverified web engines like Google/Blogs over subscribed e-library platforms.	3.41	0.58	High Extent
	Weighted Grand Aggregate (Subscribed EIR Use Items)	1.98	0.67	**Very Low Extent**

Source: field work 2026

Table 4 reveals that respondents' use of formal electronic resources was extremely low ($\bar{X}$ = 1.98). On the other hand, official university collections are strongly preferred over unverified open-access engines ($\bar{X}$ = 3.41). The evidence for the third question indicates that the aforementioned challenges lead to suboptimal use of licensed electronic databases.

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When students face barriers to access or searching databases, they resort to general search engines (e.g. Google) that are more familiar to them. In addition, Chinwe and Ugwu (2023) and Ilogho and Nkiko (2023) have done the same as us by utilizing this evidence.

Research Question 4: What is the relationship between digital search deficiencies and electronic resource utilization?

Table 5: Correlation Matrix Between Digital Search Deficiencies and EIR Utilization

Variables Analyzed	**Statistical Matrix**	**Digital Search Deficiencies**	**EIR Utilization**
Digital Search Deficiencies	Pearson Correlation (r)	1	-0.582*
	Sig. (2-tailed)		0.000
	N	291	291
EIR Utilization	Pearson Correlation (r)	-0.582*	1
	Sig. (2-tailed)	0.000	
	N	291	291

** Correlation is significant at the 0.05 level (2-tailed).*

Shortcomings in digital searching and the use of EIR have shown to be negatively correlated to each other ($r = -0.582$, $p < 0.000$). This suggests that the efficient use of subscribed electronic resources dramatically declines as digital search deficiencies rise. Further corroborating the existing correlations, correlation analysis additionally supports these correlations. A negative correlation between low digital search skills and EIR use ($r = -0.582$) signifies that the harder an individual's digital search skills are, the more the individual UEs (Unsolicited Entrepreneurs) will utilize the EIR resources. This finding corroborates that of Akuffo & Budu (2019) which noted that the immediate outcome of deficient digital search skills is a sharp decline in the volume and quality of e-resource utilization.

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Research Question 5: What is the relationship between institutional infrastructure and electronic resource utilization?

Table 6: Correlation Matrix Between Institutional Infrastructure Status and EIR Utilization

Variables Analyzed	Statistical Matrix	Institutional Infrastructure	EIR Utilization
Institutional Infrastructure	Pearson Correlation (r)	1	0.714*
	Sig. (2-tailed)		0.000
	N	291	291
EIR Utilization	Pearson Correlation (r)	0.714*	1
	Sig. (2-tailed)	0.000	
	N	291	291

** Correlation is significant at the 0.05 level (2-tailed).*

The relationship between institutional infrastructure and usage of EIR is highly correlated and significant ($r = 0.714$, $p < 0.000$) as seen from Table 6 below. This implies that more usage of electronic sources among postgraduate students is associated with better electricity supply, wider bandwidth, and methods of access outside the institution. On the other hand, the positive correlation between infrastructure and EIR usage ($r = 0.714$) shows that better infrastructure leads to more frequent, efficient, and consistent use of electronic research infrastructure (Ekene et al., 2024; Oghenetega et al., 2022). The usage of EIRs shows that both searchers' skills and the supporting infrastructure for digital access are vital for utilization.

Recommendations

Based on the empirical findings, the following recommendations are made:

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1. Compulsory Information Retrieval Workshops: Postgraduate students should compulsorily undergo credit courses in digital information literacy, with a special focus on Boolean logic and the use of search filters in databases.
2. Alternative Energy Deployments: For continuous provision of power for postgraduate e-libraries and campus network servers, university libraries should fit in special solar power inverters.
3. Bandwidth Optimization and Mirroring: For database efficiency, there is need for ICT centers to have mirror servers locally, and postgraduate research centers should have designated bandwidth blocks.
4. Simplified Remote Access Integration: There is need for implementation of single sign-on authentication services in library institutions such as Ag. OpenAthens to facilitate off-campus remote access to subscription-based databases.

Conclusion

It is observed in the study that the poor use of electronic resources by postgraduate students in Delta State University, Niger Delta University, and Rivers State University is due to the negative impact of both the poor search skills of the students and weak infrastructure of the university. Despite the purchase of good quality databases by the universities, the efficiency of the databases is hindered due to the lack of proper search skills of the students.

Therefore, the findings show that for effective utilization of electronic resources, there is a need to work on both the areas. It is essential for the universities to build up

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advanced search skills in the students along with improving infrastructure of electronic resources.

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