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IP Indian Journal of Library Science and Information Technology

Journal homepage: https://www.ijlsit.org/

Original Research Article

Exploring library service preferences: A study of information source usage in engineering colleges

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ARTICLE INFO

Article history:
Received 30-09-2024
Accepted 07-11-2024
Available online 04-12-2024

Keywords:
Artificial Intelligence
Information Sources
Academic Institutions
User Preferences
Jaypee Institute of Information Technology
Digital Resources
Print Resources
AIbased Services
Academic Libraries

ABSTRACT

This study investigates the perception and preferences of library services and information sources among patrons at engineering colleges, specifically focusing on the Jaypee Institute of Information Technology (JIIT), Noida. Utilizing a quantitative approach, the research employs a survey method, collecting data from a sample of 382 respondents, including undergraduate students, postgraduate students, research scholars, and faculty members. The survey assesses satisfaction levels across various resources, including print books, e-books, print journals, e-journals/databases, and multimedia resources, with a particular emphasis on AI-based library services. Results indicate that faculty members exhibit the highest satisfaction with library services, particularly those enhanced by artificial intelligence, while undergraduate students show the least satisfaction. The findings highlight the importance of understanding user preferences to enhance library offerings, optimize resource utilization, and improve overall user experience. This research contributes valuable insights into the evolving needs of engineering college patrons in a digital age and offers recommendations for library management to better serve its diverse user base, particularly through the integration of AI-driven services.

1. Introduction

Libraries play a crucial role in the academic environment, particularly in engineering colleges where access to diverse and up-to-date information sources is vital for both students and faculty. In the rapidly evolving landscape of higher education, the traditional role of libraries has expanded beyond merely housing books to offering a wide range of digital resources, research support, and user-centric services. Understanding how patrons perceive and prefer these services is essential for enhancing their overall experience and ensuring the library meets the needs of its users.

The LRC is equipped with state-of-the-art digital infrastructure, enabling users to access electronic resources both on-campus and remotely. The library also provides services such as document delivery, interlibrary loans, reference services, and user education programs aimed at enhancing information literacy among its patrons. Despite offering a variety of resources, understanding how these services are perceived and preferred by the users specifically engineering students and faculty remains a critical area of study for optimizing library operations and improving user satisfaction.

By analyzing user behavior and preferences, the study seeks to identify patterns in resource utilization and offer insights into how libraries can better align their services with the evolving needs of engineering students and researchers.

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https://doi.org/10.18231/j.ijlsit.2024.017

2. Literature Review

The literature review process not only facilitates the identification of gaps within the existing body of knowledge but also situates new research within the broader context of academic discourse. Engaging with prior studies allows researchers to build upon established theories, refine their research questions, and employ methodologies that have demonstrated efficacy in similar contexts. This critical examination of existing literature is essential for advancing understanding in the field and ensuring that new research contributes meaningfully to ongoing scholarly conversations.

2.1. Previous studies on library usage and user preferences in engineering college

Several studies have examined the patterns of library usage and user preferences in engineering colleges, shedding light on the distinct needs of both students and faculty. Conducted a study emphasizing the increasing reliance on digital resources, such as e-books and academic databases, particularly among students in specialized fields like computer science and electrical engineering.[1] The findings suggest that digital resources have become a cornerstone for accessing updated academic content efficiently. Similarly, it is found that users in engineering institutions often prefer online journals over physical materials due to the convenience and speed of access, which has driven the development of more user-centered digital library services.[2]

In another study, it focused on the usage patterns of faculty members in NCR engineering colleges.[3] The research highlighted that while print resources still held value, the convenience of electronic databases and journal subscriptions played a pivotal role in resource preference. These collective studies underline the ongoing necessity for libraries to balance print and electronic resources to meet the diverse demands of academic users.

2.2. Types of information sources commonly used in academic libraries

The transition from traditional print materials to electronic resources has been well-documented in academic libraries. Study revealed that engineering students predominantly favor electronic resources, including digital databases, e-journals, and institutional repositories, which provide immediate access to cutting-edge research.[4] Conversely, print resources are still significant, particularly for textbooks and other reference materials that are essential for foundational learning.

Furthermore, explored the growing use of open educational resources (OERs) in engineering colleges, highlighting how these materials, alongside digital tools like institutional repositories, have improved access to academic content while reducing costs for students.[5] Additionally, emphasize the significance of peer-reviewed electronic journals, which play a critical role in disseminating current research, especially in rapidly evolving fields such as artificial intelligence and renewable energy.[6]

2.3. Role of modern technologies in shaping library service preferences

Modern technologies have significantly transformed how library services are provided and perceived by users. Examined the impact of flipped classroom models on students' information-seeking behavior in engineering libraries, discovering that digital resources are now being integrated into the educational framework.[7] AI-powered recommendation systems, virtual reference services, and mobile library apps are just some of the technological innovations that have improved user satisfaction by tailoring services to individual needs.

Additionally, I investigated the implementation of multimodal technology, including augmented reality (AR) and AI-driven tools, to enhance user interaction with digital libraries. The study revealed that engineering students were more likely to use library services when they were accessible via mobile platforms and personalized to their academic requirements.[8] These findings indicate that modern technologies are reshaping user expectations and prompting libraries to adopt more innovative, adaptable services in response to evolving user behavior.

2.4. User behavior patterns in library resource usage

The behavior of library users, especially among engineering students, increasingly reflects a strong preference for digital access and on-demand information documented that engineering students tend to access resources remotely, often via mobile devices, leading to a decrease in the physical presence of students in library spaces.[9] However, the need for physical library spaces that offer quiet study areas and collaborative environments remains evident.

Moreover, I found that collaborative learning has been enhanced in engineering libraries through online resource-sharing platforms, which enable students to access materials simultaneously and work together in teams.[10] This shift has increased the use of digital resources, particularly databases and e-journals. In line with this, it reported a growing trend toward creating energy-efficient and environmentally sustainable libraries, which cater to user behavior by emphasizing the provision of digital resources over print.[11] Additionally, it highlighted that the quality of resources and services is of paramount importance for library users, and that effective demonstrations of available services are crucial to enhancing user satisfaction.[12] Pointed out that advancements in information technology have made e-journals a critical resource for scholarly communication. These digital journals have become a major tool for

researchers to access review articles, research papers, and scholarly discussions online.[13] Lastly, it suggested that both formal and informal educational institutions, particularly professional ones such as engineering colleges, are at the forefront of incorporating social networking sites (SNS) into the teaching and learning process, further revolutionizing the educational experience.[14]

The literature indicates a clear preference for electronic resources among engineering students, driven by the integration of modern technologies and the convenience of digital access. These trends have led academic libraries to shift focus toward improving digital collections, enhancing technology-driven services, and adapting to evolving user behavior patterns.

3. Scope of the Study

This study focuses on understanding the perception and preferences of library users at Jaypee Institute of Information Technology (JIIT), Noida. It examines the utilization of both traditional and digital library resources, exploring how students and faculty engage with various information sources, such as print materials, electronic databases, and online journals. The scope includes assessing the role of modern technology in shaping library service preferences and evaluating user satisfaction with services provided by the JIIT library. The research intends to guide the next plans for enhancing academic support and library operations.

3.1. Limitations of the study

The study is confined to JIIT users, limiting its generalizability to other institutions. It is based on self-reported survey data, which may introduce biases. Additionally, rapid technological advancements may make some findings outdated in a short period. The study does not consider factors such as budget constraints or specific administrative challenges faced by the library.

4. Objectives of the Study

1. To analyze user preferences for information sources, including print and digital materials, among students and faculty at Jaypee Institute of Information Technology (JIIT), Noida.
2. To examine the role of modern technologies in shaping library service preferences, focusing on the adoption of electronic resources and databases.
3. To assess user satisfaction with the existing library services, including the availability and accessibility of resources.
4. To identify usage patterns of library resources, comparing how different user groups (undergraduates, postgraduates, Research scholars and faculty) interact with library services.
5. To explore the balance between traditional print resources and digital technologies in supporting academic and research activities at JIIT.

5. Research Methodology

The research employs a quantitative approach to analyze the preferences and usage patterns of library services and information sources at Jaypee Institute of Information Technology (JIIT), Noida. Using a simple random sampling method, a sample size of 382 respondents comprising students and faculty was selected, ensuring each participant had an equal chance of inclusion. This method helps minimize bias and enhances the generalizability of the findings. Data collection was conducted via a survey distributed in-person, featuring structured questions on library usage frequency, preferences for print versus electronic resources, satisfaction with available services, and the use of modern technologies like online databases. The survey also sought feedback on potential improvements to library offerings. After data collection, the information was analyzed employing descriptive statistics to encapsulate user behavior, preferences, and satisfaction levels. The research aims to find trends and insights that might provide practical recommendations for improving library services at JIIT to address changing user demands.

5.1. Data analysis

Data analysis and interpretation involve systematically examining the collected data to identify patterns, trends, and relationships. In this study, quantitative methods were employed to analyze the sample. Descriptive statistics, including frequencies and percentages, were used to summarize the distribution of male and female participants.(Table 1)

The sample of 384 participants consisted of 220 males (57.29%) and 164 females (42.71%). This distribution shows a higher representation of males, indicating that they were more likely to engage in the study. Understanding this gender disparity is important for accurately interpreting the findings and may point to areas for further research on participation factors among different genders.

The above (Table 2) presents a breakdown of a sample size of 384 participants categorized by academic role and department. Among the participants, undergraduates constitute the largest group, with 236 individuals (61.46%), showing strong representation across all departments, particularly in Information Technology (52 participants, 72.22%) and Civil Engineering (46 participants, 63.89%). Postgraduates make up 82 participants (21.35%), with notable involvement in Computer Science & Engineering (26 participants, 35.62%). Research scholars represent 32 participants (8.33%), primarily engaged in Mechanical Engineering (10 participants, 15.15%). Faculty members

Table 1: Demographic profile of the users

Gender	Sample Size	Percentage
Male	220	57.29%
Female	164	42.71%
Total	384	100%

Table 2: Users' categories with discipline

Academic Role	Computer Science & Engineering	Electronics & Communication Engineering	Information Technology	Mechanical Engineering	Civil Engineering	Electrical Engineering	Total (%)
Undergraduate	32 (43.84%)	26 (30.23%)	52 (72.22%)	40 (60.61%)	46 (63.89%)	40 (71.43%)	236 (61.46)
Postgraduate	26 (35.62%)	12 (13.95%)	15 (20.83%)	10 (15.15%)	15 (20.83%)	4 (7.14%)	82 (21.35)
Research Scholar	10 (13.70%)	4 (4.65%)	4 (5.56%)	10 (15.15%)	2 (2.78%)	2 (3.57%)	32 (8.33)
Faculties	5 (6.85%)	2 (2.33%)	5 (6.94%)	6 (9.09%)	9 (12.50%)	7 (12.50%)	34 (8.85)
Total	73	44	76	66	72	53	384 100%

Table 3: Highly usage frequency of resources

Library Resources Used Most Frequently	Frequency
Books	120 (31.25%)
Journals	80 (20.83%)
E-books	50 (13.02%)
E-journals/Databases	80 (20.83%)
Others	54 (14.06%)
Total	384 (100%)

Table 4: Satisfaction level of each category by the rank

Category	Print Books	E-books	Print Journals	E-journals/databases	Remote Login to access Resources	Rank
Undergraduates	4.1	3.7	3.6	4.3	3.9	4
Postgraduates	3.8	4.2	4.0	4.5	4.1	3
Research scholars	4.0	4.1	3.9	4.4	4.2	2
Faculties	4.5	4.6	4.3	4.7	4.4	1

Table 5: With usage of modern technology-based libraries

Modern Technologies/AI in the Library (Select all that apply)	Undergraduate (n=236)	Postgraduate (n=84)	Research Scholars (n=32)	Faculties (n=34)	Total (384)	Rank
Online databases (e.g., IEEE Xplore, Scopus)	150 (63.56%)	60 (71.43%)	20 (62.50%)	25 (73.53%)	255 (66.53%)	1
Digital library services (e.g., OPAC, remote access)	180 (76.27%)	70 (83.33%)	25 (78.13%)	30 (88.24%)	305 (79.69%)	2
Library mobile apps	120 (50.85%)	50 (59.52%)	15 (46.88%)	10 (29.41%)	195 (50.78%)	3
Multimedia resources (videos, tutorials, etc.)	90 (38.14%)	40 (47.62%)	10 (31.25%)	5 (14.71%)	145 (37.89%)	4

Table 6: Resource preferences, usage patterns, and the inclusion of AI tools, with the statistical tests conducted in the study

Accessibility of Information Source	Groups Compared	Test Performed	t-value	p-value	Correlation Coefficient (r)	ANOVA F-value	Significant (Yes/No)	Regression Analysis (F, R^2, p)
Print Books	Undergraduates vs. Postgraduates	t-test	2.45	0.015	0.72	-	Yes	F = 4.76, R^2 = 0.31, p = 0.009
E-books	Research Scholars vs. Faculty	t-test	1.80	0.075	0.58	-	No	F = 3.20, R^2 = 0.25, p = 0.053
Print Journals	All User Categories	ANOVA	-	0.022	-	3.65	Yes	F = 5.15, R^2 = 0.29, p = 0.014
E-Journals/Databases	Postgraduates' vs. Faculty	t-test	1.55	0.125	0.35	-	No	F = 2.05, R^2 = 0.18, p = 0.08
Online Resources (Websites, Open Access, etc.)	All User Categories	ANOVA	-	0.065	-	2.85	No	F = 3.05, R^2 = 0.23, p = 0.065
Usage of Resources for Academic Work	Undergraduates' vs Postgraduates	t-test	2.60	0.012	0.78	-	Yes	F = 6.32, R^2 = 0.35, p = 0.006
AI Tools to Access Resources	All User Categories	ANOVA	-	0.034	-	4.10	Yes	F = 5.28, R^2 = 0.21, p = 0.013

account for 34 participants (8.85%), with a balanced presence across departments, especially in Civil engineering (9 participants, 12.50%).

The percentages for each department indicate varying levels of engagement, with Computer Science & Engineering and Information Technology attracting more undergraduates, while faculty representation is modest across all areas. Overall, the data highlights a predominance of undergraduate students in the study, which may influence the findings and recommendations, particularly regarding undergraduate-focused initiatives and support systems in the academic environment.

The (Table 3) illustrates the usage of various library resources among a sample of 384 participants. The most frequently utilized resource is books, with 120 respondents (31.25%) indicating they rely on them the most. Journals are also popular, used by 80 participants (20.83%), reflecting a strong preference for traditional academic materials. E-journals and databases are similarly favored by 80 respondents (20.83%), highlighting a significant engagement with digital resources. E-books account for 50 users (13.02%), indicating a growing acceptance of digital formats. Lastly, 54 participants (14.06%) reported using other resources, showcasing some diversity in resource preferences.

Overall, the data suggests a balanced reliance on both traditional and digital resources, with a notable inclination towards books and journals. This insight can inform library management in enhancing resource offerings and ensuring that both print and digital collections effectively meet user needs.

Rank 1 indicates the category with the highest overall satisfaction across.

The above (Table 4) provides a rank system assigned to each category (Undergraduate, Postgraduate, Research Scholars, and Faculty) based on the overall satisfaction levels with various library resources, including print books, e-books, print journals, e-journals/databases, and multimedia resources. The ranks range from 1 to 4, with 1 representing the category with the highest average satisfaction across all resources and 4 indicating the lowest satisfaction level.

Faculty ranked 1st, reflecting the highest level of satisfaction across all resource types, particularly with e-journals/databases (4.7) and e-books (4.6) followed by Research Scholars (RS) ranked 2nd, showing strong satisfaction with e-journals/databases (4.4) and multimedia resources (4.2), though print journals (3.9) scored slightly lower, Postgraduate Students (PG) ranked 3rd, with notable satisfaction in e-journals/databases (4.5) and e-books (4.2), but a relatively lower satisfaction with print books (3.8) and Undergraduate Students (UG) ranked 4th, indicating the lowest overall satisfaction, with print books (4.1) being the most favored resource, but lower scores for print journals

(3.6) and e-books (3.7).

Rank1 indicates the category with the highest overall satisfaction across resources.

The (Table 5) provides an overview of the usage of various modern technologies in the library among different user groups, including undergraduate students, postgraduate students, research scholars, and faculty members. Digital library services (e.g., OPAC and remote access) emerged as the most favored resource, with a total of 305 users (79.69%), showcasing strong engagement, particularly among faculty (88.24%) and postgraduate students (83.33%). Following closely, online databases such as IEEE Xplore and Scopus were utilized by 255 users (66.53%), reflecting a significant preference among faculty (73.53%) and postgraduate students (71.43%). In contrast, library mobile apps had a total usage of 195 users (50.78%), indicating moderate adoption, especially among undergraduates (50.85%). Lastly, multimedia resources (videos, tutorials, etc.) ranked the lowest with only 145 users (37.89%), revealing less engagement, particularly among faculty members (14.71%). This data highlights a clear preference for digital services and online databases, emphasizing their critical role in enhancing the library experience and supporting academic success among users. The findings suggest that continued investment and promotion of these technologies could further improve user engagement and satisfaction.

The above (Table 6) explains the print books, the t-test reveals a significant difference in preference between undergraduates and postgraduates ($t = 2.45$, $p = 0.015$). This result is further supported by the regression analysis, which shows that 31% of the variance in print book preferences can be predicted by user category ($F = 4.76$, $R^2 = 0.31$, $p = 0.009$), indicating a strong relationship between user type and print book usage.

The analysis of e-books shows no significant difference between research scholars and faculty ($t = 1.80$, $p = 0.075$). However, the regression analysis suggests that user category still accounts for a moderate 25% of the variance in e-book preference ($F = 3.20$, $R^2 = 0.25$, $p = 0.053$), though this relationship is not statistically significant.

For print journals, the ANOVA test shows a significant difference across all user categories ($F = 3.65$, $p = 0.022$), supported by regression analysis, which predicts 29% of the variance in preference based on user category ($F = 5.15$, $R^2 = 0.29$, $p = 0.014$). This indicates notable differences in print journal preferences among user groups.

For e-journals/databases, the results show no significant differences between postgraduates and faculty ($t = 1.55$, $p = 0.125$). The regression analysis ($F = 2.05$, $R^2 = 0.18$, $p = 0.08$) suggests that user category explains only 18% of the variance, with no significant predictive power.

For online resources (websites, open access, etc.), ANOVA results are not significant ($F = 2.85$, $p = 0.065$), and the regression analysis indicates that user category explains 23% of the variance in preference ($F = 3.05$, $R^2 = 0.23$, $p = 0.065$), though the relationship is not statistically significant.

Regarding academic work resource usage, the t-test shows a significant difference between undergraduates and postgraduates ($t = 2.60$, $p = 0.012$). Regression analysis reveals that 35% of the variance in resource usage can be explained by user category ($F = 6.32$, $R^2 = 0.35$, $p = 0.006$), indicating a strong and significant predictive relationship.

Finally, for AI tools used to access resources, the ANOVA shows a significant difference across user categories ($F = 4.10$, $p = 0.034$), with regression analysis explaining 21% of the variance ($F = 5.28$, $R^2 = 0.21$, $p = 0.013$). This suggests that AI tool usage is influenced by user category.

Overall, the findings indicate that user categories significantly influence preferences and usage patterns for print resources, academic resources, and AI tools, while e-resources show moderate but not statistically significant relationships.

6. Findings and Discussion

The analysis of preferences for information sources and resource usage among different user categories—undergraduates, postgraduates, research scholars, and faculty yields several critical insights. Using various statistical tests, including t-tests, ANOVA, and regression analysis, we examined the differences in preference and usage patterns across these groups, as well as the relationship between user category and resource preference.

6.1. Print books

The significant results imply that traditional print media remain relevant among certain groups, particularly undergraduates, likely due to the structured learning environment and reliance on textbooks.

6.2. E-books

This result suggests that e-books are similarly valued by both research scholars and faculty, possibly due to the flexibility, accessibility, and convenience of digital formats for academic work. However, the lack of statistical significance implies that other factors—such as discipline, technological proficiency, or access to institutional resources—may play a larger role in determining e-book usage.

6.3. Print journals

The significant relationship between user category and print journal preference indicates that despite the growing availability of electronic journals, print journals still hold

value for certain academic users, possibly for citation purposes or in fields where print remains the standard.

7. E-Journals/Databases

These findings suggest that e-journals and databases are widely accepted and used across different user categories, especially in research-intensive environments. The lack of significant variance indicates that e-journals are a critical resource for all academic users, regardless of their role, reflecting the broad shift towards digital academic publishing and research dissemination.

7.1. Online resources

This suggests that online resources are uniformly used across the board, likely because they provide free and easy access to information. The increasing importance of open access and websites as academic resources is evident, though no single user category dominates in their usage. Factors like open access policies, ease of searching, and the integration of these resources into research and learning workflows could explain this widespread adoption.

8. Usage of Resources for Academic Work

This highlights that user category plays a significant role in determining how often and in what ways academic resources are used. Undergraduates may use resources more frequently for course-related work, while postgraduates and research scholars might use them for more specialized research. This finding suggests that different user groups may require tailored library services and resources to best meet their academic needs.

9. AI Tools to Access Resources

The significant variance explained by user category indicates that AI tools are becoming an important aspect of academic work, though their adoption is likely influenced by familiarity, access, and the specific demands of academic roles.

10. Discussion

The results from the study demonstrate that different user categories—undergraduates, postgraduates, research scholars and faculty—exhibit distinct preferences and usage patterns for information sources. Traditional resources like *print book*s and *print journals* still hold significant value, especially among undergraduates and research scholars, respectively. This suggests that physical library collections continue to play a critical role in academic work for certain user groups. However, the growing preference for *e-books, e-journals,* and *online resources* reflects the increasing shift towards digital and open access materials, driven by convenience, ease of access, and the widespread availability of digital platforms.

The significant findings for *AI tools* suggest that technology is increasingly influencing how academic users access and interact with resources. As AI tools become more prevalent, libraries may need to provide training and support for users to fully utilize these technologies, ensuring that all user categories can benefit from the advancements in resource discovery and data management.

Overall, the results suggest that academic libraries must offer a balanced mix of both traditional and digital resources, catering to the diverse needs of their users. The findings also highlight the importance of user-specific services, such as resource training, personalized support, and enhanced digital access, to ensure that all user categories can effectively engage with the resources they need for their academic work.

11. Conclusion

The findings of this study provide critical insights into the perceptions and preferences of library services and information sources among patrons of engineering colleges, particularly at Jaypee Institute of Information Technology (JIIT), Noida. The data indicates that while faculty members express a high level of satisfaction with library resources, especially those enhanced by artificial intelligence, undergraduate students demonstrate significant room for improvement in their experience with library services.

Institutionally, it is essential to recognize the diverse needs of different user groups. The results suggest that the library should prioritize enhancements in digital resources, user engagement, and the incorporation of AI-based services to address the specific preferences of undergraduate students. By actively seeking feedback and implementing tailored strategies, the library can foster a more supportive learning environment that meets the evolving demands of its patrons.

Furthermore, the study emphasizes the importance of continuous assessment and adaptation of library services to align with the technological advancements and changing expectations of users. Institutional commitment to improving library offerings will not only enhance user satisfaction but also contribute to the overall academic success of the engineering college community. By investing in innovative solutions and maintaining open channels of communication with patrons, the library can better position itself as a vital resource in the academic journey of its users.

Overall, the findings emphasize the importance of providing a balanced collection of traditional and digital resources, alongside targeted services that address the unique needs of each user category. Libraries must continue to evolve in response to changing user preferences, ensuring that they remain relevant and accessible in the digital age while also preserving the value of traditional resources.

12. Conflict of Interest

None.

13. Source of Funding

None.

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Cite this article: Pandey P, Mishra S. Exploring library service preferences: A study of information source usage in engineering colleges. *IP Indian J Libr Sci Inf Technol* 2024;9(2):103-110.