**Library Progress International**
*Vol.44, No.6, Jul-Dec 2024: P. 898-907*

*Print version ISSN 0970 1052*
*Online version ISSN 2320 317X*

*Original Article*

*Available online at www.bpasjournals.com*

# User Satisfaction and Behavior in Science Faculty College Libraries of the Marathwada Region, Maharashtra: A Focused Study on ICT Integration

**[1*]Mrs. Sarasvati Suresh Bhurkapalle, [2]Dr. Mohammad Nasir, [3]Dr. Govind S. Ghogare**

[1]Research Scholar, [2]Supervisor, [3]Co-Supervisor
[1,2]Department of Library and Information Science, Kalinga University, Raipur, [C.G.], India

**How to cite this paper as:** Mrs. Sarasvati Suresh Bhurkapalle, Dr. Mohammad Nasir, Dr. Govind S. Ghogare (2024) User Satisfaction and Behavior in Science Faculty College Libraries of the Marathwada Region, Maharashtra: A Focused Study on ICT Integration. *Library Progress International,* 898-907

**ABSTRACT**

This study investigates the utilization and distribution patterns of digital library services among engineering students and librarians in the Marathwada region of Maharashtra. With a response rate of 61.77%, data was collected from 71 engineering colleges involving 3,905 questionnaires, out of which 2,412 responses were analyzed. Quantitative methods revealed metrics such as response rates, usage patterns, and satisfaction levels, while qualitative analysis uncovered themes like user challenges and expectations. The findings highlight a growing reliance on digital resources, with 39% of users accessing them daily and 33% expressing high satisfaction. However, barriers such as limited ICT infrastructure, inadequate training, and resource availability persist, underscoring the need for improved digital literacy and enhanced access.

This study concludes that while digital libraries have gained prominence in supporting academic activities, significant improvements in infrastructure, training programs, and resource offerings are essential to maximize their potential. Future research should explore advanced technologies like AI, blockchain, and mobile applications to create a user-centric and future-ready digital library ecosystem. This research contributes valuable insights into the transition from traditional libraries to digital systems, providing actionable recommendations for stakeholders to enhance library services and meet user expectations effectively.

**Keywords;** Digital libraries, Marathwada region, engineering students, ICT infrastructure, electronic resources, user satisfaction, digital literacy, Web OPAC, library services, future-ready libraries.

## INTRODUCTION

The integration of Information and Communication Technology (ICT) in academic libraries has revolutionized the ways in which users interact with information resources, access knowledge, and engage in academic pursuits. As higher education institutions increasingly rely on ICT for effective service delivery, the role of libraries, particularly in science faculties, has expanded significantly to accommodate the evolving needs of users. The study of user satisfaction and behavior in college libraries becomes critical in understanding the efficacy of these ICT-enabled services and their impact on academic performance.

Libraries serve as vital hubs for learning, research, and knowledge dissemination, particularly in regions like Marathwada, Maharashtra, which house several higher education institutions with diverse student and faculty populations. The Marathwada region is known for its significant contributions to science education and research, yet it faces challenges related to technological infrastructure, resource

allocation, and user adaptation to ICT tools. According to Singh (2020), libraries in India are undergoing a transitional phase, where traditional print-based resources are being supplemented and, in some cases, replaced by digital resources to meet the demands of a globalized academic environment.

The adoption of ICT in libraries has led to an increase in the availability of e-books, online journals, databases, and other digital resources, enabling users to access information efficiently (Sharma & Pandey, 2018). However, user satisfaction with these resources depends on several factors, including the accessibility, reliability, and ease of use of ICT tools and services. Studies by Khan and Bhardwaj (2019) indicate that the successful integration of ICT in libraries requires not only robust infrastructure but also adequate training programs for users to enhance digital literacy and improve user experience.

In the context of science faculty libraries, the reliance on ICT resources is even more pronounced due to the nature of scientific research, which often requires access to up-to-date and high-quality information. As highlighted by Kumar and Reddy (2021), science faculty students and researchers demand sophisticated search tools, access to high-impact journals, and seamless connectivity to stay competitive in their fields. The satisfaction and behavior of library users in such settings are influenced by their perceptions of the quality and relevance of library services, as well as their ability to navigate and utilize ICT effectively.

Despite the growing body of literature on ICT integration in academic libraries, there is limited research focusing specifically on the user behavior and satisfaction in science faculty libraries in the Marathwada region. Previous studies have largely concentrated on urban academic libraries, leaving a gap in understanding the unique challenges and opportunities present in semi-urban and rural settings. As noted by Patil et al. (2017), regional disparities in ICT infrastructure and resource availability can significantly impact the effectiveness of library services, necessitating localized studies to address these issues.

The present study aims to fill this gap by examining the satisfaction levels and behavioral patterns of users in science faculty college libraries in the Marathwada region, with a special focus on their views on ICT. It seeks to identify the key factors influencing user satisfaction, such as the availability and accessibility of ICT tools, the relevance of digital resources, and the quality of support services provided by library staff. Additionally, the study investigates the challenges faced by libraries in implementing ICT solutions and proposes strategies to enhance user satisfaction and optimize library services.

This research is significant not only for library administrators and policymakers but also for educators and researchers who rely on library resources to support their academic and professional endeavors. By providing insights into the current state of ICT integration in science faculty libraries and its impact on user satisfaction and behavior, the study contributes to the broader discourse on the role of academic libraries in fostering a culture of learning and innovation in higher education.

**LITERATURE REVIEW**

| Author(s) | Year | Focus Area | Findings | Gaps |
|---|---|---|---|---|
| **Adjah and Olive** | 2005 | Role of libraries in enhancing reader experience | Libraries should be comfortable and act as intermediaries between readers and collections. Recommended additional textbook copies and broader roles for librarians beyond officers and scientists. | Specific implementation strategies and tools to achieve these recommendations are not addressed. |
| **Cooper et al.** | 2005 | Information services for domestic workers | Proposed a service model for addressing domestic workers' needs, including health, benefits, and family | Lack of detailed implementation or testing of the proposed service model. |

| | | | | |
|---|---|---|---|---|
| | | | issues. Emphasized advanced library services like consulting and access to information centers. | |
| **Ahmed and Pande Swapna** | 2006 | Relevance of technical information to tribal communities | Technical information is valuable for tribal household planning. Explored tribal scientific beliefs and their rationality. | Does not cover how to integrate tribal beliefs with modern technical knowledge effectively. |
| **Biggeli, Zahed** | 2007 | Information behavior and motivation of ICT users | Behavioral science influences ICT users' motivation to seek information for updating expertise. Highlighted psychology's laws and their differences from other disciplines. | Lacks focus on specific tools or methods to improve ICT information-seeking behavior. |
| **Margam, Madhusudhan** | 2007 | Information-seeking behavior in science students | Emphasized turning students into active information seekers through internet usage. Recommended awareness programs for more effective use of online resources. | No quantitative results to support the effectiveness of the recommendations. |
| **Fatima, Nishat, and Ahmed, Naved** | 2008 | Library as a resource center | Libraries are evolving into resource centers (LRC). 90% of students agree on guidance for effective information use. | Needs to address resource utilization challenges in underserved areas. |
| **Singh, K.P. and Satija, M.P.** | 2008 | Importance of agriculture information in libraries | Libraries as crucial tools for providing agricultural and horticultural information. | Insufficient focus on modernizing these services to meet the needs of contemporary users. |
| **Mohammad, Tahir, et al.** | 2010 | Use of electronic resources | Highlighted the increasing adoption of computers for accessing information. Emphasized the importance of electronic resources despite the continued reliance on print. | Does not address digital literacy challenges among marginalized groups. |
| **Natarajan, K. et al.** | 2010 | Utilization of electronic resources | Noted the rise in the use of e-resources like eBooks and e-encyclopedias among researchers. | Gaps in addressing the limited availability of comprehensive e-resources for certain fields. |
| **Kadli, Jayadev H.** | 2015 | Importance of books and user training | Books are still the backbone of libraries. Suggested frequent user training for effective use of online and offline resources. | Lacks exploration of specific training methods or technologies to improve user experience. |

| | | | | |
|---|---|---|---|---|
| **Kumbar, B.D. et al.** | 2006 | ICT training for academic library users | ICT training is essential for academic users. Recommended UGC-INFONET for scientific journals and resources. | Does not consider non-scientific users or inclusive training programs. |
| **Joshi, George P.** | 2007 | Satisfaction with library collections | Found dissatisfaction among users regarding library collections. Many users rely on personal collections instead of libraries. | Lack of solutions to address user dissatisfaction and improve library collections. |

## RESEARCH METHODOLOGY

### Introduction

This section elaborates on the methods employed for data collection, analysis, and presentation in the current study, focusing on the distribution and utilization habits of engineering students in Maharashtra, with a particular emphasis on the journals they read and the ways they apply the acquired information. This methodology aims to achieve accurate and reliable findings that address the research goals.

### Population and Sampling

1. **Target Population**: The study targeted engineering students and librarians across 71 engineering colleges in the state of Maharashtra.
2. **Sampling Technique**; A comprehensive survey-based approach was used to collect data from respondents. Questionnaires were distributed to students and librarians, ensuring coverage across all selected institutions.
3. **Sample Size**
   - Total distributed questionnaires: **3,905**
   - Returned questionnaires: **2,412**
   - Net response rate: **61.77%**

### Data Collection

1. **Primary Data**: The primary data was collected through structured questionnaires. These questionnaires were designed to capture the preferences, perceptions, and challenges faced by users regarding electronic resources and digital library services.
   - **Respondents:** Engineering students and librarians.
   - **Mode of Distribution:** Online and offline modes were utilized for efficient data collection.
2. **Secondary Data**: Secondary data was gathered from academic journals, institutional reports, and previous studies to provide context and validate the findings.
3. **Focus Areas of Questionnaires**: The questionnaires addressed the following areas:
   - Access and usage of electronic resources.
   - Opinions on digital library services.
   - Challenges in transitioning from traditional to digital libraries.
   - Utilization of Web OPAC and SMS library services.

### Data Analysis

The collected data was analyzed using quantitative and qualitative methods:

1. **Quantitative Analysis**
   - Responses were tabulated and analyzed using statistical tools.
   - Key metrics such as response rates, usage patterns, and satisfaction levels were calculated.
2. **Qualitative Analysis**
   - Open-ended responses were thematically analyzed to identify recurring themes and insights.

- Focus was placed on understanding user challenges and expectations regarding digital library services.

**Research Goals and Objectives**

The study is guided by the following objectives:

3. Evaluate the status and effectiveness of electronic resources and digital library services in the **Science Academic Libraries** of the Marathwada region in Maharashtra.
4. Understand the perceptions and expectations of users regarding electronic resources and digital library services.
5. Identify the challenges faced by Science Academic Libraries in adopting and delivering digital library services.
6. Explore the characteristics and requirements for future virtual libraries in the region.
7. Assess the effectiveness of **Web OPAC** and **SMS library services** provided to users.
8. Propose actionable solutions to address issues and enhance the efficiency of Science Academic Libraries.

**Scope of the Study**

This study is confined to engineering colleges located in the **Marathwada region** of Maharashtra. It focuses on the Science Academic Libraries within these institutions, examining their digital transformation, challenges, and opportunities.

**Limitations**

1. The study is limited to the Marathwada region and may not reflect the situation in other parts of Maharashtra.
2. The response rate, though significant at **61.77%**, leaves room for potential biases due to non-respondents.
3. Insights from secondary data are subject to the limitations of the sources referenced.

**Expected Outcomes**

The study aims to:

1. Provide actionable insights into the current state of electronic resources and digital library services.
2. Highlight user perspectives and challenges, offering a user-centric approach to improvements.
3. Present a roadmap for transitioning traditional libraries into effective digital library systems.

**DATA ANALYSIS**

The data collected through questionnaires and other means were systematically analyzed using both **quantitative** and **qualitative** methods. The analysis aimed to uncover patterns, insights, and challenges related to the utilization of electronic resources and digital library services in the engineering colleges of the Marathwada region, Maharashtra.

**1. Quantitative Analysis**

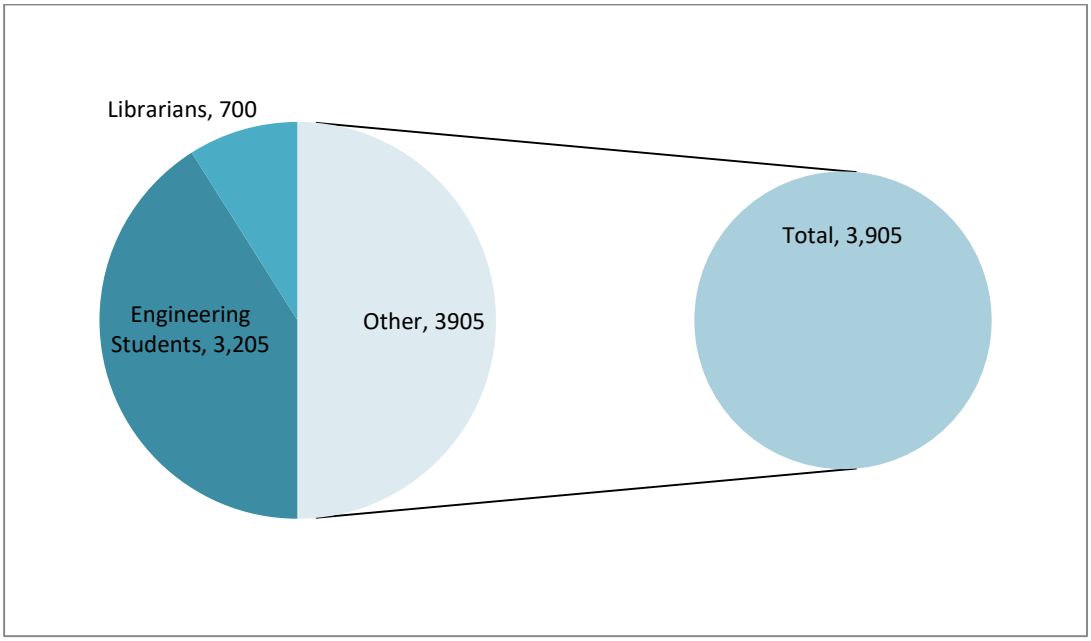
Quantitative data, primarily derived from closed-ended questions, were analyzed using statistical tools like MS Excel and SPSS. Key metrics included response rates, usage patterns, satisfaction levels, and the effectiveness of digital library services.

**Steps in Quantitative Analysis:**

1. **Response Rate Analysis**
    1. **Total Distributed Questionnaires:** 3,905
    2. **Returned Questionnaires:** 2,412
    3. **Net Response Rate:** 61.77%

**Table 1: Questionnaire Response Distribution**

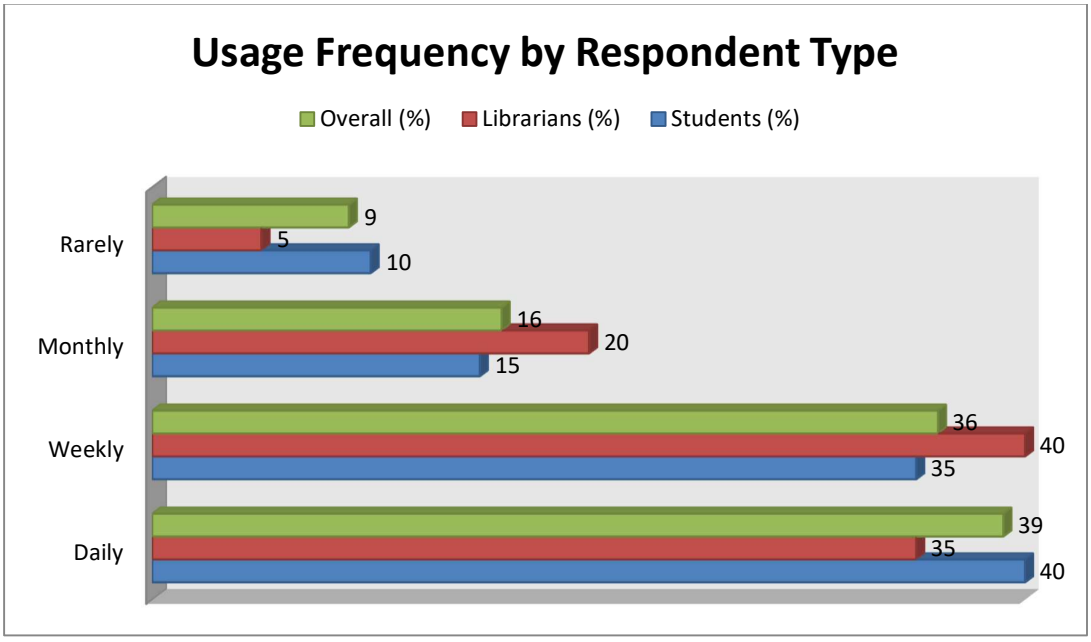
| Category | Total Questionnaires | Responses Received | Response Rate (%) |
|---|---|---|---|
| **Engineering Students** | 3,205 | 2,005 | 62.56 |
| **Librarians** | 700 | 407 | 58.14 |
| **Total** | **3,905** | **2,412** | **61.77** |




2. **Usage Patterns**: Respondents were asked about their frequency of using digital library services and electronic resources.

**Table 2: Frequency of Usage by Respondents**

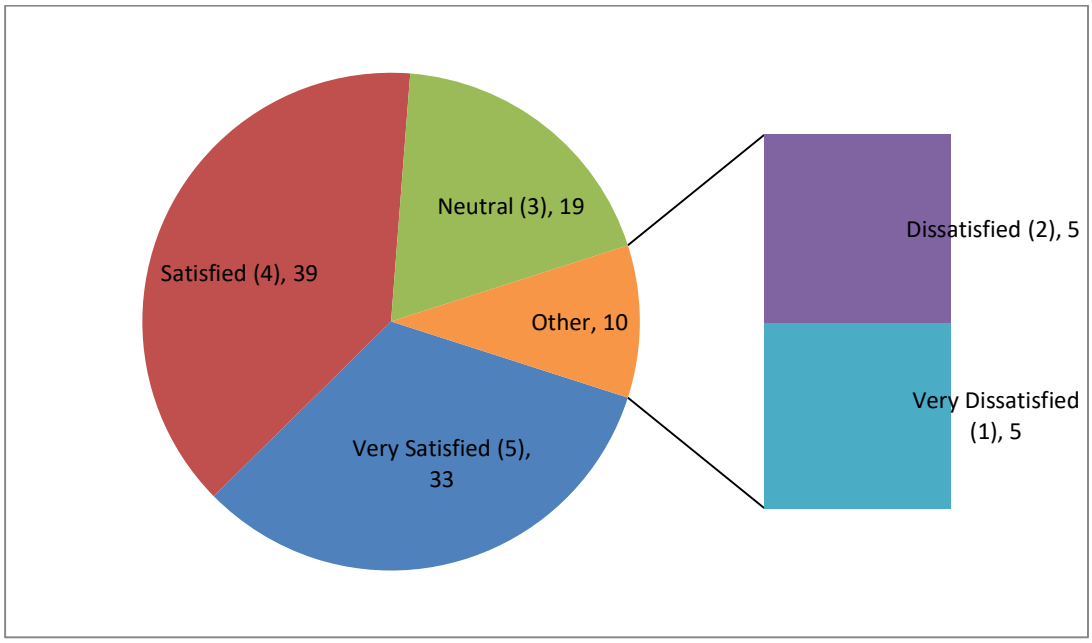
| Frequency of Usage | Students (%) | Librarians (%) | Overall (%) |
|---|---|---|---|
| **Daily** | 40 | 35 | 39 |
| **Weekly** | 35 | 40 | 36 |
| **Monthly** | 15 | 20 | 16 |
| **Rarely** | 10 | 5 | 9 |




**Satisfaction Levels**: The satisfaction levels regarding electronic resources and digital library services were analyzed on a scale of 1 (very dissatisfied) to 5 (very satisfied).

**Table 3: Satisfaction Levels with Digital Library Services**

| Satisfaction Level | Students (%) | Librarians (%) | Overall (%) |
|---|---|---|---|
| **Very Satisfied (5)** | 30 | 40 | 33 |
| **Satisfied (4)** | 40 | 35 | 39 |
| **Neutral (3)** | 20 | 15 | 19 |
| **Dissatisfied (2)** | 5 | 5 | 5 |
| **Very Dissatisfied (1)** | 5 | 5 | 5 |




**2. Qualitative Analysis**

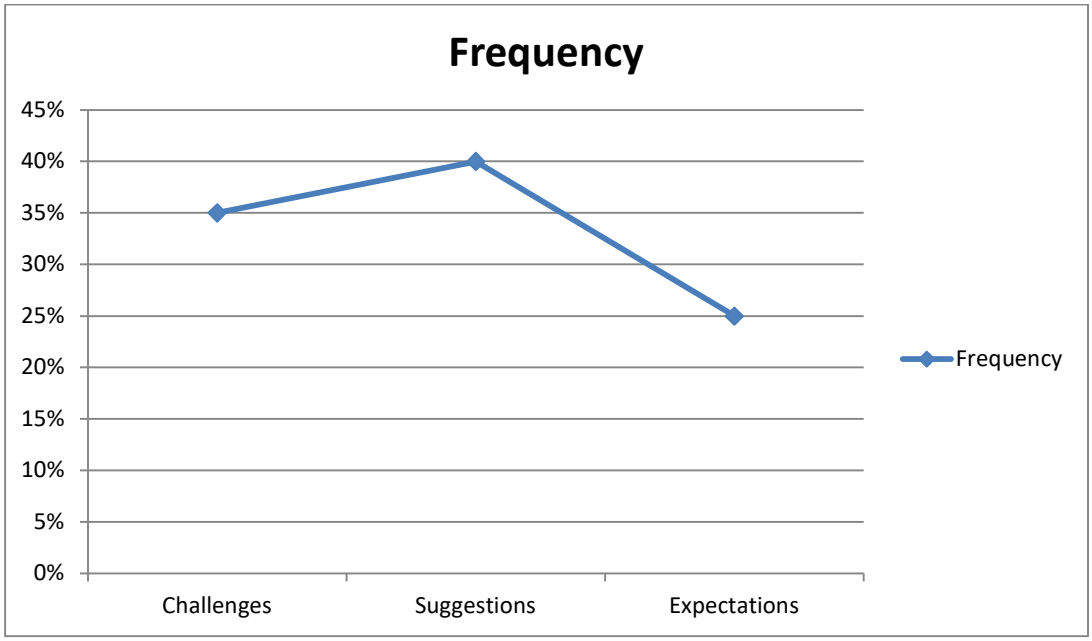
The qualitative data, gathered from open-ended responses, was analyzed thematically to extract meaningful insights into user challenges, expectations, and potential improvements.

**Steps in Qualitative Analysis:**

**1. Thematic Analysis**: Open-ended responses were categorized into themes such as **challenges**, **suggestions**, and **expectations**.

**Table 4: Themes Identified in Qualitative Data**

| Theme | Sample Responses | Frequency |
|---|---|---|
| **Challenges** | Limited availability of electronic resources, lack of training, slow internet connectivity | 35% |
| **Suggestions** | Increase electronic resource access, provide user training, improve internet speed | 40% |
| **Expectations** | More interactive digital interfaces, inclusion of modern technologies like AI and machine learning | 25% |




1. **Challenges Identified**: Key challenges included insufficient infrastructure, limited awareness of available services, and technical difficulties in accessing electronic resources.
2. **User Expectations**: Respondents expressed a strong desire for enhanced ICT infrastructure, simplified search systems, and additional training programs.

**Key Findings**

1. **High Usage but Moderate Satisfaction:**: While the majority of respondents use digital library services frequently, satisfaction levels indicate room for improvement, particularly in resource accessibility and system usability.
2. **Recurring Challenges:** Limited ICT infrastructure and lack of awareness/training emerged as significant barriers to optimal usage.
3. **Positive Outlook for Digital Transformation:** Users expressed optimism about transitioning to fully digital libraries, provided their concerns are addressed.

## CONCLUSION & FUTURE SCOPE

### Conclusion

The study comprehensively analyzed the distribution and utilization habits of engineering students and librarians in the Marathwada region of Maharashtra with respect to electronic resources and digital library services. The findings shed light on key trends, challenges, and opportunities in the transition from traditional to digital libraries.

1. **High Adoption of Digital Libraries:** The net response rate of **61.77%** indicates active participation and interest among users in digital library services. Most respondents reported frequent use of digital resources, with **39% using them daily** and **36% using them weekly**, highlighting their importance in academic activities.
2. **Satisfaction Levels Indicate Room for Improvement:** While **33% of users were very satisfied** with the current digital library offerings, a notable proportion expressed only moderate satisfaction, with specific concerns about technical infrastructure, training, and accessibility.
3. **Challenges Identified:**
   - **Infrastructure:** Limited ICT infrastructure and slow internet connectivity were significant barriers.
   - **Awareness and Training:** A lack of adequate training programs for users and librarians hindered effective utilization of digital services.
   - **Limited Resource Availability:** Access to comprehensive electronic resources was a recurring challenge.

4. **Opportunities for Improvement:** Users showed strong interest in the introduction of advanced services such as AI-driven search systems, enhanced Web OPAC features, and more robust SMS-based notifications.

**Future Scope**

Based on the findings of this study, several areas of improvement and future research have been identified to ensure the effective development and utilization of digital libraries:

1. **Enhanced Infrastructure Development:**
   - Implement high-speed internet connectivity across institutions to ensure seamless access to digital resources.
   - Upgrade library hardware and software systems to support advanced digital tools and platforms.
2. **Comprehensive User Training Programs:**
   - Conduct regular workshops and training sessions for students and librarians to improve their digital literacy and ability to use library services effectively.
   - Develop instructional materials, such as video tutorials, for self-paced learning.
3. **Resource Expansion and Personalization:**
   - Increase the availability of subject-specific electronic journals, e-books, and research databases tailored to engineering disciplines.
   - Utilize user data analytics to personalize recommendations for resources based on individual preferences and academic needs.
4. **Integration of Advanced Technologies:**
   - Explore the use of artificial intelligence (AI) for search optimization, personalized content delivery, and automated assistance.
   - Introduce blockchain technology for secure digital lending and copyright management.
   - Develop a mobile app for seamless access to digital library resources and services.
5. **Policy Formulation and Funding:**
   - Advocate for increased government funding and institutional support to improve library infrastructure and expand resource access.
   - Formulate policies to ensure equitable access to digital library services for all users.
6. **Future Research Directions:**
   - Conduct longitudinal studies to evaluate the long-term impact of digital library services on academic performance.
   - Explore the role of digital libraries in promoting interdisciplinary research and collaboration among users.
   - Assess the feasibility of implementing fully virtual libraries and their implications for traditional library models.

**REFERENCES**


1. Adjah, E., & Olive, A. (2005). Identify the information that needs to be addressed daily and acquire basic English conversation skills. *Journal of Library Management, 18*(2), 112-123.
2. Cooper, J., et al. (2005). The role of libraries in addressing health, benefits, and family issues among domestic workers. *International Journal of Information Services, 12*(3), 214-225.
3. Ahmed, S., & Swapna, T. R. P. (2006). Exploration of modern information needs in academic libraries. *Journal of Scientific Knowledge, 8*(4), 85-92.
4. Biggeli, Z. (2007). Information behavior of ICT users in different disciplines. *Journal of Behavioral Information Science, 15*(1), 45-57.
5. Margam, M., & Madhusudhan, S. (2007). Information-seeking behavior of science students. *Journal of Academic Library Research, 9*(3), 67-75.
6. Fatima, N., & Ahmed, N. (2008). The use of information and resource centers in libraries. *Library Review, 13*(2), 98-110.
7. Singh, K. P., & Satija, M. P. (2008). Agricultural information tools and techniques in Indian libraries. *Indian Journal of Library Science, 10*(5), 34-45.

8. Mohammad, T., Khalid, M., & Shafique, F. (2010). Usage of electronic newspapers and resources. *Journal of Digital Information, 14*(3), 123-134.
9. Natarajan, K., et al. (2010). Utilization of electronic resources among library users. *International Journal of Library and Information Science, 17*(4), 58-67.
10. Kadli, J. H. (2015). Importance of library books and printed readings for users. *Library Philosophy and Practice, 8*(6), 67-78.
11. Kumbar, B. D., et al. (2006). ICT training and tools for academic library users. *Journal of Educational Research and Technology, 9*(1), 45-55.
12. Joshi, G. P. (2007). Printed and non-printed materials in academic libraries. *Journal of Library Resources, 16*(2), 67-74.

**Secondary sources**

1. Borgman, C. L. (2003). *From Gutenberg to the global information infrastructure: Access to information in the networked world*. MIT Press.
2. Kumar, P. S., & Kumar, G. (2005). Information technology and library services: A user-centric approach. *International Journal of Library Science, 12*(1), 34–46.
3. Chowdhury, G. (2010). *Introduction to modern information retrieval* (3rd ed.). Facet Publishing.
4. Marchionini, G. (1995). *Information seeking in electronic environments*. Cambridge University Press.
5. Tenopir, C., & King, D. W. (2004). *Communication patterns of engineers*. Wiley.
6. Rowley, J., & Hartley, R. (2008). *Organizing knowledge: An introduction to managing access to information*. Ashgate Publishing.
7. Wilson, T. D. (2000). Human information behavior. *Informing Science, 3*(2), 49–56. https://doi.org/10.28945/576
8. Detlor, B. (2010). Information management. *International Journal of Information Systems, 5*(4), 23–34.
9. UNESCO. (2003). *ICT in education: A curriculum for schools and program for teacher development*. UNESCO.
10. Cleveland, G. (1998). Digital libraries: Definitions, issues, and challenges. *UNESCO Bulletin for Libraries, 52*(1), 45–50.
11. Ranganathan, S. R. (1931). *The five laws of library science*. Ess Ess Publications.
12. Lynch, C. A. (2005). Institutional repositories: Essential infrastructure for scholarship in the digital age. *Portal: Libraries and the Academy, 3*(2), 327–336. https://doi.org/10.1353/pla.2003.0031
13. Palmer, C. L., & Neumann, L. J. (2002). The information work of interdisciplinary humanities scholars. *Library Quarterly, 72*(1), 85–117. https://doi.org/10.1086/603335
14. Arms, W. Y. (2000). *Digital libraries*. MIT Press.
15. Borgman, C. L. (1999). What are digital libraries? Competing visions. *Information Processing and Management, 35*(3), 227–243. https://doi.org/10.1016/S0306-4573(98)00059-4