Assessing the Usability and User Perception of Mobile Library Apps: A Case Study of Kazi-Nazrul University, West Bengal

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Abstract

Purpose: This study examines user perceptions and usability of the mobile library application at Kazi Nazrul University, Asansol, Paschim Bardhaman, West Bengal, with a focus on understanding how students and faculty engage with mobile services such as catalogue searching, e-resource access, book renewal, notifications, and reference support within the framework of the Technology Acceptance Model (TAM).

Design/Methodology/Approach: Data were collected through a structured questionnaire administered to 150 respondents within the university, including students and faculty. The analysis includes descriptive statistics, frequency distributions, usability assessment, and cross-tabulation of usage patterns to explore differences between user groups and to link results to perceived ease of use and perceived usefulness.

Findings: The study reveals a positive trend in mobile library adoption, with strong engagement in basic functions such as catalogue searches and notifications. Usability was generally rated positively, especially in terms of ease of navigation, speed, and information accuracy. However, challenges such as poor internet connectivity, limited features, and occasional app malfunctions were reported. Cross-tabulation shows differing usage patterns between students and faculty, with faculty demonstrating higher use of research-oriented features.

Research Limitations: The research is confined to a single institution and relies on self-reported data, which may be influenced by respondent bias. The skewed sample (80% students, 20% faculty) and the focus on one specific mobile platform may limit broader generalizability.

Practical Implications: Findings highlight the need for technical enhancements such as Progressive Web App (PWA) features for offline access, chat-based librarian support, and more frequent updates to improve usability and address contextual challenges in the Indian academic environment.

Originality/Value: The study applies the Technology Acceptance Model (TAM) to mobile library services in an Indian university context, providing insights into user behaviour, differential use by user type, and practical recommendations for service improvement that can inform similar initiatives elsewhere.

Keywords: Mobile Library Services, Technology Acceptance Model, Usability, Academic Libraries, User Perceptions, Kazi Nazrul University

1. Introduction

The integration of mobile technology into library services has changed how users access information. From searching catalogues to requesting books and accessing e-resources, mobile library services offer a user-oriented approach to information retrieval. This study evaluates the effectiveness and usability of such services at Kazi-Nazrul University, Paschim Bardhaman, West Bengal, Library through direct user feedback.

Kazi Nazrul University (KNU), Asansol, Paschim Bardhaman, West Bengal, was established in 2012 by the Government of West Bengal to promote higher education and research in the region. The university offers undergraduate, postgraduate, and doctoral programs across diverse disciplines, including science, humanities, social sciences, commerce, and management. With a focus on academic excellence and digital resource accessibility, KNU has developed a central library equipped with modern information services, including e-resources, digital repositories, and a mobile-accessible catalogue.

The library serves a diverse user community comprising students, faculty members, and researchers, making it a suitable case for evaluating mobile library services and user acceptance. Its adoption of modern digital platforms, such as the Koha-based mobile web application, reflects the university's commitment to enhancing accessibility, efficiency, and user-centered library services in line with contemporary trends in academic libraries.

In the digital era, libraries are continuously evolving to meet the dynamic needs of users by incorporating advanced technologies. One of the most significant advancements is the integration of mobile-based library services, which allow users to access information resources anytime and anywhere. With the rapid proliferation of smartphones and mobile internet, academic libraries are leveraging mobile platforms to provide seamless access to library catalogues, e-resources, book renewals, notifications, and reference services. These services aim to enhance user convenience, improve access equity, and foster a more interactive and personalized user experience. Mobile library applications are not only an extension of traditional library services but also a transformative tool that reshapes how users interact with information. However, the effectiveness of these services largely depends on user perception, ease of use, accessibility, and satisfaction. Understanding these factors is crucial for ensuring that mobile library services are user-centered and fulfil their intended objectives.

The mobile library service examined in this study is delivered through a Koha Integrated Library Management System (ILMS)-based mobile web application implemented at the Central Library of Kazi Nazrul University, Asansol, Paschim Bardhhaman, West Bengal. Rather than a standalone native mobile app, the service operates as a mobile-optimised web interface integrated with Koha, allowing users to access library services through smartphones and tablets. The platform enables users to perform key functions such as searching the Online Public Access Catalogue (OPAC), accessing subscribed e-resources, renewing and reserving books, receiving library notifications, and submitting reference-related queries. The system is customised to suit local user requirements while retaining the core functionalities of the Koha ILMS. Identifying the mobile library service as a Koha-based implementation is significant, as Koha is an open-source ILMS

widely adopted by academic libraries in India. This contextual detail enhances the replicability and practical relevance of the study, allowing other librarians and institutions to compare findings, assess feasibility, and draw lessons for implementing or improving similar mobile library services. Despite the growing implementation of mobile library solutions across academic institutions, there remains a lack of in-depth research into how users perceive and utilize these services in specific contexts. This study seeks to fill that gap by investigating the user perceptions and usability of mobile library services at Kazi-Nazrul University, Asansol, Paschim Bardhhaman, West Bengal. By conducting a detailed case study, the research aims to provide insights into user behaviours, preferences, and the challenges they face, thereby offering recommendations for improving service design and delivery.

2. Technology Acceptance Model (TAM)

The Technology Acceptance Model (TAM), proposed by Davis (1989), is a widely used theoretical framework for explaining users' acceptance and adoption of information systems. TAM posits that an individual's intention to use a technology is primarily determined by two key factors: Perceived Ease of Use (PEOU), the degree to which a user believes that using a system will be free of effort and Perceived Usefulness (PU), the extent to which a user believes that the system will enhance their task performance. These perceptions influence users' attitudes toward the technology and their actual usage behaviour. Due to its simplicity and strong explanatory power, TAM has been extensively applied in studies examining the adoption of digital and mobile library services in academic environments.

The Technology Acceptance Model has been extensively applied and empirically validated across diverse domains of information systems, including e-learning platforms, mobile applications, digital libraries, and academic information services. Numerous studies have confirmed the reliability and predictive power of TAM in explaining users' technology adoption behaviour, with perceived ease of use and perceived usefulness consistently emerging as significant determinants of acceptance and continued use. In the context of library and information science, TAM has been widely used to assess user perceptions of online databases, institutional repositories, and mobile library applications, demonstrating its suitability for evaluating both usability and functional value. Owing to its strong empirical support and adaptability, TAM provides a robust framework for analysing user acceptance of mobile library services in higher education institutions.

3. Literature Review

The adoption of mobile technologies in libraries has significantly transformed the way users access and interact with information services. As smartphones and mobile internet penetration continue to grow, libraries are leveraging these platforms to provide user-oriented services that align with modern information-seeking behaviour (Cummings et al., 2021). Mobile library applications enable users to search catalogues, access digital resources, reserve books, receive notifications, and even interact with librarians in real-time. These services enhance accessibility and convenience, particularly for students who prefer quick, on-the-go

information retrieval (Alhassan, 2020). Several studies have examined the usability and acceptance of mobile library services. According to Kim and Park (2020), perceived ease of use and perceived usefulness are significant predictors of mobile app adoption among university students. Their study found that interface simplicity, search functionality, and responsiveness were key features influencing user satisfaction. Similarly, Xu and Du (2019) emphasized that mobile library services must be continuously updated and user-tested to ensure that they meet the evolving needs of their users. User satisfaction is closely linked to usability, which includes factors such as navigation design, system reliability, content accuracy, and personalization (Nielsen, 2012). A study by Choi and Ruan (2019) found that even when services are available, poor interface design or technical glitches can discourage users from engaging with the application. Moreover, access to mobile library services does not always guarantee effective use unless supported by digital literacy and awareness among users (Fatoki, 2021). Despite the increasing availability of mobile services, challenges persist. These include limited features, inconsistent connectivity, lack of awareness among users, and resistance to technological change among librarians (Mohammed & Singh, 2022). Addressing these issues requires libraries to adopt a user-oriented design approach and involve users in the development and evaluation process. Recent studies emphasize the growing importance of mobile-first strategies in academic libraries, particularly in the Indian context. Gaikwad and Bilawar (2023) highlight that adopting mobile and emerging digital technologies is no longer optional but essential for ensuring inclusive access to library resources, supporting both students and faculty in their academic and research activities.

4. Statement of the Problem

With the rapid advancement of mobile technology, academic libraries are progressively adopting mobile-based services to address the changing needs of their users. These services are designed to improve access to information resources and simplify library interactions and support academic productivity. However, despite the growing integration of mobile apps in library systems, there remains a significant gap in understanding how users perceive their usability, effectiveness, and limitations. Many mobile library applications face challenges such as inconsistent performance, limited features, and inadequate user support, which may affect their adoption and satisfaction levels. Additionally, user expectations continue to rise, especially among digital-native students who demand intuitive, responsive, and personalized digital experiences. Therefore, it is essential to examine user perceptions and usability aspects of mobile library services in a real-world academic setting to identify strengths, address shortcomings, and inform future improvements.

5. Objectives of the Study
i) To evaluate how often and for what purposes students utilise mobile library services.
ii) To evaluate the usability and satisfaction level of the mobile application.
iii) To identify the challenges and limitations faced by users.
iv) To provide recommendations for improving mobile-based library services.

6. Methodology

This study employed a descriptive survey research design to assess user perceptions and the usability of mobile library services at Kazi-Nazrul University, Asansol, Paschim Bardhhaman, West Bengal. A structured questionnaire was developed and distributed both online and in printed form to a purposive sample of 150 users, including undergraduate and postgraduate students as well as faculty members who positively use the university's mobile library application. The questionnaire consisted of both closed-ended and Likert-scale questions covering areas such as frequency of use, ease of navigation, satisfaction with specific features, and overall usability. Data collection was conducted over a period of five weeks. The responses were compiled and analysed using Microsoft Excel software, employing descriptive statistics such as frequencies, percentages, mean scores, and standard deviations to interpret the data. The methodology was designed to provide a quantitative assessment of user experiences to identify key strengths and areas for improvement in mobile library service delivery.

7. Scope of the Study

This study focuses on evaluating user perceptions, usability, and acceptance of mobile-based library services offered by Kazi Nazrul University, Asansol, Paschim Bardhhaman, West Bengal, using the Technology Acceptance Model (TAM) as the guiding framework. It examines how students and faculty members interact with the university library's mobile application, particularly in relation to core services such as catalogue searching, access to e-resources, book renewal, notifications, and virtual reference services. The study is confined to users within the university who have prior experience using the mobile library application. Data were collected through a structured questionnaire designed to capture indicators related to perceived ease of use, perceived usefulness, usage frequency, satisfaction levels, and challenges encountered while using the app. The primary objective is to analyse user acceptance patterns and identify practical, user-driven recommendations for improving mobile library services. The study does not address the technical development or backend architecture of the application, nor does it undertake a comparative evaluation of mobile library services across different institutions.

8. Limitations of the Study

The findings of this study should be interpreted considering certain limitations. First, the study is limited to a single institution, which restricts the generalizability of the results to other universities or library environments. Second, the respondent sample is skewed towards students (80%), with faculty members representing only 20% of participants. While this reflects the primary user base of mobile library services, it limits deeper comparative insights into faculty usage behaviour. Additionally, the study relies on self-reported data, which may be influenced by recall bias and subjective perceptions. The focus on a single mobile library application also means that the findings may not represent the usability or acceptance of other mobile library platforms with different technical designs or feature sets. The cross-sectional nature of data collection, conducted over a limited time frame, may not capture seasonal or academic-cycle variations in usage patterns. Finally, the study does not incorporate qualitative feedback or

perspectives from non-users, which could have provided deeper insights into barriers related to awareness, motivation, or adoption.

9. Data Analysis

The demographic profile of the Table 1 respondents reveals that a slight majority were male (54.7%), while females constituted 45.3% of the sample. Most respondents (63.3%) fell within the 18–24 years age group, indicating a high level of engagement among younger users. A smaller portion belonged to the 25–34 years (26.7%) and 35+ years (10%) categories. In terms of user type, students comprised the largest group at 80%, while faculty members represented 20% of the participants. This distribution reflects the primary user base of mobile library services at Kazi-Nazrul University, Asansol, Paschim Bardhhaman, West Bengal.

Table 1: Demographic Profile of Respondents

Demographic variables		No. of Respondents	Percentage (%)
Gender	Male	82	54.7%
	Female	68	45.3%
Age	18–24 years	95	63.3%
	25–34 years	40	26.7%
	35+ years	15	10%
Type of user	Students	120	80%
	Faculty	30	20%

Table 2: Frequency of Mobile Library App Usage

Frequency of Use	No. of Respondents	Percentage (%)
Daily	35	23.3%
Weekly	55	36.7%
Monthly	40	26.7%
Rarely	20	13.3%
Daily	35	23.3%

The frequency of mobile library app usage shown in Table 2 provides important insights into users' acceptance of the technology through the lens of the Technology Acceptance Model (TAM). High levels of weekly (36.7%) and daily usage (23.3%) indicate that a significant proportion of respondents perceive the mobile library application as useful for supporting their academic activities, thereby demonstrating strong Perceived Usefulness (PU). Regular engagement suggests that the app effectively facilitates routine tasks such as accessing library resources, managing loans, and receiving timely updates. Monthly usage (26.7%) reflects situational but purposeful engagement, implying that users still recognise the app's usefulness during specific academic needs such as assignments or examinations. Conversely, the relatively small proportion of rare users (13.3%) may indicate lower perceived usefulness or external constraints such as internet connectivity issues or reliance on traditional library services. According to TAM, sustained and frequent use is more likely when a system is both useful and easy to use; therefore, the observed usage patterns, when considered alongside positive usability evaluations (Perceived Ease of Use), collectively explain the overall acceptance of the mobile library app among users.

Table 3: Purpose of Mobile Library App Usage by User Type

Purpose of Use	Students (n=120)		Faculty (n=30)	
	Number	%	Number	%
Searching Library Catalogue	85	70.8	17	56.7
Accessing e-Resources	62	51.7	23	76.7
Renewing Books	68	56.7	7	23.3
Asking Reference Questions	22	18.3	13	43.3
Receiving Notifications/Updates	78	65.0	12	40.0

The cross-tabulation analysis reveals distinct usage patterns of Table 3 between students and faculty, adding depth to the findings and strengthening the explanatory power of the Technology Acceptance Model (TAM). Students demonstrate higher usage of the app for catalogue searching, book renewal, and receiving notifications, indicating a task-oriented and transactional pattern of use aligned with coursework and circulation needs. This behaviour reflects strong Perceived Usefulness (PU) of the app for routine academic activities. Faculty members, in contrast, show substantially higher engagement with accessing e-resources (76.7%) and asking reference questions (43.3%), suggesting a research-oriented use of the mobile library service. This indicates that faculty perceive the app as particularly useful for scholarly information access and consultative support, even though their overall frequency of use may be lower than that of students.

From a TAM perspective, these differences suggest that perceived usefulness varies by user group, shaped by distinct academic roles and expectations. While the app effectively supports students' operational needs, it holds untapped potential as an interactive research support tool for faculty. Strengthening advanced research features and virtual reference services could therefore enhance perceived usefulness across both user categories and promote more balanced adoption. While 68% of respondents use the mobile library app for catalogue searches, overall engagement in "Asking Reference Questions" (23.3%) is comparatively low, indicating a transactional rather than interactive relationship with the service. Students primarily use the app for routine tasks such as catalogue searches, book renewal, and notifications, reflecting high Perceived Usefulness (PU) for operational activities. Faculty, on the other hand, demonstrate higher engagement with e-resources and reference queries, suggesting research-oriented usage. Overall, the app functions effectively as a search and service delivery tool, but is underutilised as a communication hub, highlighting opportunities to enhance interactive and consultative features.

Table 4: Assessing the Usability of Mobile Library Apps
(Likert Scale: 1–5)

Usability Criteria	Mean Score	Interpretation
Ease of Navigation	4.1	Very Good
Interface Design	3.8	Good
Speed/Responsiveness	4.0	Very Good
Accuracy of Information	4.3	Excellent
Overall Satisfaction	3.9	Good

The usability evaluation presented in Table 4 strongly reflects the Perceived Ease of Use (PEOU) construct of the Technology Acceptance Model (TAM). High mean scores across key usability dimensions indicate that users generally find the mobile library application easy to operate and cognitively undemanding. *Accuracy of information* achieved the highest mean score (4.3), suggesting a high level of trust in the system, which positively reinforces users' confidence and continued usage.

Similarly, strong ratings for *ease of navigation* (4.1) and *speed and responsiveness* (4.0), both interpreted as "very good," indicate that users can interact with the app efficiently without excessive effort. These findings suggest that the app minimises complexity and supports smooth task completion, which is central to perceived ease of use under TAM. The *interface design* received a slightly lower mean score (3.8), interpreted as "good," implying that although the visual layout is acceptable, further refinements in design aesthetics and layout consistency could enhance usability.

The overall satisfaction score of 3.9 reflects a favourable general user experience and reinforces the relationship proposed by TAM, wherein higher perceived ease of use contributes to greater satisfaction and continued system acceptance. Taken together, these results confirm that the mobile library application demonstrates strong perceived ease of use, which, when combined with its perceived usefulness, explains the positive adoption and sustained usage observed among respondents.

Table 5: Major Challenges in Using Mobile Library Services

Challenge	Respondents	Percentage
Poor Internet Connectivity	45	30.0
App Crashes or Bugs	35	23.3
Limited Features/Functionalities	40	26.7
Difficult Login or Access Issues	20	13.3
Lack of Awareness	10	6.7

The challenges identified in Table 5 highlight key factors influencing user acceptance of the mobile library app within the Technology Acceptance Model (TAM) framework. Poor internet connectivity (30%), the most frequently reported issue, significantly affects both Perceived Ease of Use (PEOU) and Perceived Usefulness (PU) by disrupting seamless access to services, a critical concern in the Indian higher education context. To address this, the adoption of Progressive Web App (PWA) technology, enabling offline caching of catalogue metadata and essential resources, is recommended to enhance usability and service continuity. Other challenges, such as limited features (26.7%), app crashes or bugs (23.3%), and login difficulties (13.3%), further reduce perceived usefulness and ease of use by increasing user effort and diminishing system reliability. These findings underscore the need for regular system updates, feature expansion, and simplified authentication mechanisms. The relatively low reporting of lack of awareness (6.7%) suggests that adoption barriers are predominantly technical rather than informational. Addressing these challenges holistically would strengthen both PEOU and PU, thereby improving overall acceptance and sustained use of mobile library services.

Table 6: Suggestions for Improvement

Suggestion	Respondents	Percentage
Add Chat Support with Librarian	85	56.7
Offline Access to Resources	60	40.0
Improve App Speed/Performance	50	33.3
More Tutorials/Help Features	45	30.0
Frequent Updates & Bug Fixes	55	36.7

The user suggestions presented in Table 6 provide valuable insights into how the mobile library application can be enhanced to strengthen user acceptance under the Technology Acceptance Model (TAM). The most frequently suggested improvement, adding chat support with a librarian (56.7%), indicates a strong user demand for interactive and consultative services. This enhancement would directly increase Perceived Usefulness (PU) by enabling real-time academic support and personalised information assistance. The request for offline access to resources (40%) reflects users' need to overcome connectivity limitations, a key contextual challenge in the Indian academic environment. Implementing offline features, such as metadata caching through Progressive Web App (PWA) technology, would reduce access barriers and improve both Perceived Ease of Use (PEOU) and Perceived Usefulness (PU). Similarly, suggestions related to frequent updates and bug fixes (36.7%) and improving app speed and performance (33.3%) highlight the importance of system reliability and responsiveness, which are critical determinants of perceived ease of use.

Additionally, more tutorials and help feature (30%) indicate that improved user guidance could lower learning effort, particularly for first-time or less technologically confident users, thereby enhancing perceived ease of use. Overall, these suggestions collectively outline a user-driven roadmap for improving the mobile library application in ways that align closely with TAM constructs and are likely to promote sustained usage and higher user satisfaction.

8. Findings

The study reveals that the mobile library application is widely used by both students and faculty at Kazi-Nazrul University, Asansol, Paschim Bardhhaman, West Bengal, with most respondents accessing the app on a weekly or monthly basis. This indicates a steady level of engagement with mobile-based library services. The primary purposes of use include searching the library catalogue, accessing e-resources, receiving notifications, and renewing or reserving books, highlighting the app's role in supporting routine academic and information needs.

Overall usability was rated positively, particularly in terms of ease of navigation, system responsiveness, and accuracy of information, reflecting strong Perceived Ease of Use (PEOU) and Perceived Usefulness (PU). These findings suggest that users find the app both functional and convenient for accessing essential library services. However, several technical and functional limitations were also identified, including app crashes, limited features, and login or access issues, which negatively affect user experience and system reliability.

The most significant challenge reported was poor internet connectivity, which substantially hindered effective app usage and reduced

both perceived ease and usefulness—an important contextual issue within the Indian higher education environment. In response, users expressed a clear demand for enhanced features, particularly real-time chat support with librarians, offline access to resources, improved performance, and additional tutorials or help features.

Overall, the findings indicate a positive adoption trend for mobile library services, with strong utilisation of core functions. At the same time, they underscore the need for technical improvements and feature enhancements to strengthen usability, reliability, and sustained acceptance of mobile library applications in academic settings.

9. Suggestions for Further Studies

Although this study provides meaningful insights into user perceptions and usability of mobile library services within a single university setting, future research could broaden its scope through comparative studies across multiple institutions or geographic regions to enhance generalizability. Longitudinal research designs may be employed to examine changes in user behaviour, satisfaction, and acceptance over time as mobile technologies and user expectations evolve.

Further studies may also adopt qualitative methods, such as in-depth interviews or focus group discussions, to gain deeper insights into user experiences, expectations, and contextual barriers to adoption. Investigating the impact of advanced app features including virtual reference services, AI-driven discovery tools, and personalised recommendations, on academic productivity and learning outcomes would add valuable dimensions to existing research. Additionally, incorporating facilities for visually impaired or differently-abled users would help assess accessibility, inclusivity, and universal design considerations in mobile library service development.

10. Conclusion

Mobile library services at Kazi Nazrul University, Asansol, face several challenges, including poor internet connectivity, limited features, and occasional app malfunctions, which can affect user adoption and satisfaction. The study finds that, despite these barriers, users, primarily students, demonstrate strong engagement with core functions such as catalogue searching, accessing e-resources, renewing books, and receiving notifications. Faculty, meanwhile, show higher usage for research-oriented tasks like e-resource access and reference queries. Usability aspects, including ease of navigation, speed, and accuracy of information, were rated positively, though interface design and technical stability require improvement.

To enhance adoption and satisfaction, the university library should address technical challenges, implement Progressive Web App (PWA) features for offline access, expand interactive functionalities such as chat-based librarian support, and ensure regular updates and bug fixes. By integrating these improvements, mobile library services can become more reliable, user-friendly, and effective, fulfilling both operational and research needs and strengthening overall engagement in the academic digital environment.

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