



User Experience-Based Digital Library Service Design to Improve Access to Scholarly Information

Naufal Permadi^{1*}, Meutia Hermawan², Arif Safitri³

^{1,2} Department of Information Science, Faculty of Communication Sciences, Universitas Padjadjaran, Bandung, Indonesia

³ Department of Library and Information Science, Faculty of Humanities, Universitas Indonesia, Depok, Indonesia

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ABSTRACT

This study aims to explore user experience-based digital library service design to improve access to scholarly information in a university library context. The study addresses the problem of users' difficulties in navigating digital library platforms, accessing full-text documents, and using scholarly information resources effectively. A qualitative case study approach was used to examine users' experiences in depth. The research was conducted at the University Library of Universitas Islam Negeri Raden Intan Lampung, Bandar Lampung, Indonesia, from September to November 2025. Data were collected through semi-structured interviews, non-participant observation, and document analysis. Participants included students, lecturers, librarians, and information technology staff selected through purposive and snowball sampling. The data were analyzed using thematic analysis supported by data condensation, data display, and conclusion drawing. The findings reveal five main themes: users' confusion in starting scholarly information searches, barriers to full-text access, limited digital information literacy, the need for responsive librarian assistance, and expectations for simpler and more integrated digital service design. These findings show that access to scholarly information is not only a technological issue, but also a social, academic, and service-related process. The study contributes to user-centered digital library research by linking user experience, task-technology fit, and digital inclusion perspectives. The findings imply that university libraries need to develop integrated access systems, practical user guidance, responsive digital assistance, and regular user experience evaluation to improve scholarly information access.



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*) Corresponding Author:

Naufal Permadi,
Department of Information Science, Faculty of Communication Sciences, Universitas Padjadjaran, Bandung, Indonesia
Email: naufal.permadi128@gmail.com

1. Introduction

Digital library services have become a central infrastructure in higher education because scholarly information is no longer accessed only through physical collections. Students, lecturers, and researchers now depend on repositories, subscribed databases, e-books, discovery tools, online catalogs, and institutional websites to support academic work. This shift grew stronger after the COVID-19 period, when university libraries had to extend digital access, remote assistance, and

online information services in a short time (Mehta & Wang, 2020). Studies in Bangladesh, Pakistan, South Africa, Jordan, and Indonesia show that digital library services helped maintain learning and research continuity, but users still faced problems related to platform complexity, low digital literacy, unstable access, and limited guidance (Begum & Elahi, 2022; Rafiq et al., 2021). This situation shows that the quality of digital library services cannot be measured only by collection availability. It must also be assessed through the lived experience of users when searching, selecting, accessing, and using scholarly information.

In the Indonesian context, digital libraries have expanded through institutional repositories, open access portals, e-resources, and campus-based digital library applications. However, user experience remains uneven. Some users feel helped by online access, while others experience confusion because search menus, metadata structures, interface design, and access procedures are not always clear (Mahardhini & Irawati, 2021). A systematic review by Dinazzah and Irawati (2022) also shows that users expect digital libraries to provide easier navigation, faster access, and more practical assistance. Research on e-resources among Indonesian students further indicates that access to digital scholarly information depends not only on platform availability but also on user readiness, search skills, and the relevance of resources to academic tasks (Rahmi, 2021). These findings are important because academic information access affects learning quality, research productivity, citation behavior, and students' ability to participate in scholarly communication.

Field problems in digital library services often appear in small but repeated user experiences. Users may not know which search box to use, how to distinguish repository documents from subscribed databases, how to access full-text articles, or how to solve login barriers. Dragon et al. (2025) found that the growth of electronic resources and discovery systems has made the library search environment more complex, so libraries need a deliberate approach to guide users toward relevant resources. Similar evidence appears in studies of e-book use, where students did not always use available collections optimally because of access barriers, device limitations, reading discomfort, and lack of awareness (van der Westhuizen et al., 2024). These problems show that digital library design should not focus only on system functions. It should focus on how users interpret the system, what obstacles they face, and how they move from information need to successful access.

User experience-based design offers a relevant theoretical lens for understanding these problems. In digital library studies, UX includes usability, usefulness, accessibility, emotional response, search satisfaction, interface clarity, and the match between digital services and user tasks. Barifah et al. (2020) explain that evaluating UX in digital libraries requires attention to the interaction between users, content, and system design. Kuhar and Merčun (2022) also found that search box placement, homepage intuitiveness, and previous user experience influence how users perceive digital libraries. From the perspective of task-technology fit, Omotayo and Haliru (2020) argue that digital library use increases when technology fits students' academic tasks. These theories support the view that digital library services must be designed from the user's academic behavior, not only from institutional assumptions about what users need.

Recent studies have discussed digital library adoption, digital transformation, artificial intelligence, digital inclusion, and satisfaction models. For example, Abbas et al. (2022) examined e-library service adoption through technology readiness and planned behavior, while Riady et al. (2025) integrated TAM and information system success models to explain digital library use, satisfaction, and net benefits in the Indonesian Open University context. Wang et al. (2024) highlighted the role of libraries in digital inclusion and digital literacy education, while Lu et al. (2025) showed that readers' willingness to use digital services depends on perceived benefits, trust, and perceived risks. However, many of these studies use quantitative models, systematic reviews, or institutional perspectives. They do not deeply explore how users give meaning to their

access experiences, how they describe obstacles in their own language, and how their daily academic practices shape expectations toward digital library service design.

This study aims to explore user experience-based digital library service design to improve access to scholarly information. The study focuses on users' experiences in searching, accessing, evaluating, and using scholarly resources through digital library platforms at the University Library of Universitas Islam Negeri Raden Intan Lampung, Bandar Lampung, Indonesia. The research was conducted from September to November 2025. Theoretically, this study contributes to the development of user-centered digital library studies by connecting UX theory, task-technology fit, and digital inclusion perspectives. Practically, this study provides evidence-based recommendations for improving interface design, access flow, user assistance, digital literacy support, and service evaluation in academic libraries.

2. Materials and Methods

This study used a qualitative case study approach. This approach was selected because the research aimed to explore user experience in a specific digital library service context, not to measure statistical relationships between variables. A case study allows the researcher to examine how users experience digital services, how they interpret access barriers, and how library staff respond to user needs in a real institutional setting. This design suits UX-based library research because user experience is shaped by interaction, perception, academic task, service culture, and digital infrastructure.

The research was conducted at the University Library of Universitas Islam Negeri Raden Intan Lampung, Bandar Lampung, Indonesia. The study took place from September to November 2025. This location was selected because the university library provides several digital information access points, including an online catalog, institutional repository, digital collections, e-resource access, and online user assistance. The selected site also represents a higher education library that serves students, lecturers, and researchers with different levels of digital literacy and scholarly information needs.

The participants consisted of students, lecturers, librarians, and library information technology staff. The main participants were undergraduate and postgraduate students who had used the digital library service at least three times during the last academic semester. Lecturers were included because they use scholarly information for teaching, research, and publication. Librarians and IT staff were included to explain service design, technical constraints, and user support practices. The study used purposive sampling because participants had to meet specific criteria related to digital library use. Snowball sampling was also used when initial participants recommended other users who had relevant experiences with access barriers, repository use, database searching, or digital service assistance. Purposive sampling helps qualitative researchers select information-rich cases that match the research objective (Campbell et al., 2020).

Data were collected through semi-structured interviews, non-participant observation, and document analysis. Interviews explored users' experiences when searching for journal articles, theses, books, proceedings, and other scholarly materials. Interview questions focused on access flow, interface clarity, search difficulties, emotional responses, service expectations, and suggestions for design improvement. Observation was conducted by watching how users navigated digital library platforms, selected keywords, opened search results, and handled access problems. Document analysis examined library service guides, website menus, repository pages, helpdesk records, user manuals, and digital literacy materials. This combination helped the researcher capture both spoken experience and actual service interaction.

Data validation used triangulation, member checking, and audit trail. Source triangulation compared information from students, lecturers, librarians, and IT staff. Method triangulation compared interview data, observation notes, and documents. Member checking was conducted by returning summaries of interview findings to selected participants to confirm whether the

interpretation matched their experience. An audit trail was maintained by recording interview guides, field notes, coding decisions, data reduction tables, and theme development logs. These steps strengthened credibility, dependability, and confirmability in the qualitative process.

Data were analyzed using thematic analysis. The process followed six stages: familiarizing with data, generating initial codes, searching for themes, reviewing themes, defining themes, and writing the findings. Braun and Clarke (2021) emphasize that thematic analysis is suitable for identifying patterns of meaning across qualitative data. In this study, initial codes included terms such as search confusion, login difficulty, unclear metadata, full-text access, librarian support, mobile access, trust in sources, and interface expectation. These codes were then grouped into larger themes, such as access barriers, user navigation patterns, digital literacy needs, service support gaps, and user-centered design expectations.

The analysis also used an interactive logic of data condensation, data display, and conclusion drawing. Interview transcripts and observation notes were condensed into meaningful units. The researcher then built matrices to compare user groups, types of access barriers, and design expectations. The final interpretation connected field findings with UX theory, task-technology fit, and digital inclusion. This method allowed the study to explain not only what problems users faced, but also why those problems occurred and how digital library services could be redesigned to improve scholarly information access.

3. Results and Discussions

The findings show that users' experiences with digital library services were shaped not only by the availability of electronic collections, but also by the clarity of access pathways, ease of navigation, digital information literacy, and librarian support. Based on interviews, observation, and documentation, five main themes emerged: users' confusion in starting scholarly information searches, barriers to full-text access, limited digital information literacy, the need for more responsive assistance, and users' expectations for simpler and more integrated digital service design.

The first theme concerns users' confusion when starting scholarly information searches. Most students knew that the university library provided digital services, but they did not fully understand the difference between the online catalog, institutional repository, journal databases, and e-book collections. Observation showed that several users entered broad keywords into the search box without a clear search strategy. As a result, the search results were too wide, less relevant, or difficult to evaluate. One student stated, "I usually type the assignment topic directly into the search box, but the results are too many, and I do not know which one is the most suitable." This statement shows that the main problem was not only technological access, but also users' understanding of academic information structures.

The second theme relates to barriers in obtaining full-text documents. Some users could find relevant article titles, books, or theses, but they could not always access the complete documents. These barriers occurred because of inactive links, metadata-only records, database access restrictions, or unclear login procedures. A postgraduate student stated, "I found an article that matched my topic, but when I opened it, only the abstract appeared. I did not know whether I had to log in, ask a librarian, or search somewhere else." This finding shows that successful scholarly information access does not end when users find a source. It must continue until users can open, read, and use the document.

The third theme concerns limited digital information literacy. Several participants were not familiar with alternative keywords, Boolean operators, year filters, document-type filters, or author-based searches. They tended to use simple search habits similar to general search engines. This pattern made it difficult for them to obtain specific and high-quality scholarly sources. A librarian explained, "Many students come to us not because the sources are unavailable, but

because they do not know how to find the right sources.” This finding indicates that digital library services need practical information literacy programs that respond directly to users’ academic needs.

The fourth theme shows that users needed more responsive service support. Interviews with students and lecturers revealed that librarian assistance remained important, even when services had shifted to digital platforms. Users needed guidance on how to access databases, search for reputable articles, download documents, and evaluate source credibility. However, some users stated that help information was not always visible on the digital library page. One lecturer said, “A good system still feels distant when users do not know whom to contact when they face a problem.” This statement shows that digital service design must include communication, technical support, and academic assistance as essential parts of the user experience.

The fifth theme relates to users’ expectations for simpler and more integrated digital service design. Users expected a single access point that connected the online catalog, institutional repository, e-journals, e-books, user guides, and librarian assistance. They also expected mobile-friendly pages, concise instructions, clear menu language, and search features that could suggest relevant keywords. Observation showed that users felt more comfortable when the service flow followed clear steps, such as “search for sources,” “select source type,” “access full text,” and “ask for help.” Therefore, digital library service design needs to move from a collection-oriented approach to a user-experience-oriented approach.

Overall, the findings indicate that access to scholarly information should not be understood only as a technological issue. Access is also a social and academic process that involves learning habits, information-seeking culture, digital skills, and the quality of interaction between users and librarians. An effective digital library does not merely provide resources. It also helps users understand how to find, select, access, and use scholarly information appropriately. This finding is important because students and lecturers need services that are not only fast, but also understandable, reliable, and aligned with their academic needs.

Discussion

The findings support the concept of user experience, which emphasizes that the quality of a digital system should be understood through users’ real interactions with the service. In the context of digital libraries, user experience includes navigation ease, information clarity, access satisfaction, trust, and the ability of the system to support academic tasks. Barifah et al. (2020) argue that user experience evaluation in digital libraries needs to consider the relationship between users, content, and system design. The present study supports this view because the barriers experienced by users were not only technical, but also related to how users understood the structure of digital services.

The findings also align with Kuhar and Merčun (2022), who found that interface design, search box placement, and previous experience influenced users’ perceptions of digital libraries. In this study, users faced difficulties because the digital service was not fully intuitive. Scattered menus, technical terms, and indirect access flows made users spend more time finding scholarly sources. This means that digital service design should follow users’ logic, not only the administrative logic of system managers.

The finding on full-text access barriers is consistent with Dragon et al. (2025), who found that the increasing number of electronic resources can make information discovery more complex. Users may find bibliographic information, but they may still fail to access the complete document. In this study, such barriers appeared in the form of broken links, restricted access, and unclear login procedures. This condition shows that libraries need to map the user journey from the first search stage to the final document-use stage. Without this mapping, a digital library may function only as a display space for information sources, rather than as an effective access tool for scholarly information.

The finding on limited digital information literacy strengthens Rahmi's (2021) argument that students' use of e-resources depends on their ability to understand digital sources. It also supports Wang et al. (2024), who position libraries as important actors in strengthening digital literacy and information inclusion. Users with stronger search skills were more independent in accessing scholarly sources. In contrast, users who were not familiar with academic search strategies needed clearer guidance. Therefore, digital service design must be supported by user education, not only by platform development.

From the perspective of task-technology fit, the findings show that digital library services become more useful when available features match users' academic tasks. Omotayo and Haliru (2020) explain that digital library use increases when technology fits users' task needs. In this study, students needed articles for coursework, theses, and research proposals. Lecturers needed sources for teaching, research, and publication. However, the system did not always help users adjust the search process to these academic needs. This suggests the need for service design based on usage scenarios, such as searching for final project references, finding recent journal articles, identifying theoretical sources, and locating lecturers' publications.

This study also offers a new perspective by showing that user experience in digital libraries is shaped by the relationship between technology and academic culture. Users did not always fail to access information because the system was unavailable. They also experienced difficulties because they were not familiar with how scholarly information works, including keyword selection, database filters, subscription access, and journal credibility evaluation. In other words, access problems result from both system design issues and users' academic practices. This perspective expands digital library studies that often focus on technology adoption, user satisfaction, or information system success through quantitative models.

The theoretical implication of this study lies in strengthening user-centered digital library service design. The study shows that digital library service design needs to integrate user experience theory, task-technology fit, and digital inclusion. User experience explains users' perceptions and interactions. Task-technology fit explains the match between service features and academic tasks. Digital inclusion explains the importance of access that is fair, understandable, and usable for users with different levels of digital ability. These three perspectives can form a conceptual basis for future studies on digital library service development in higher education.

The practical implication is that libraries need to develop digital services that are more integrated, simple, and responsive. First, libraries need to provide one access point that connects the online catalog, institutional repository, journal databases, e-books, user guides, and help services. Second, libraries need to prepare short user guides based on real user needs, such as how to search for articles, access full text, use keywords, and contact librarians. Third, libraries need to strengthen digital consultation services through chat, help forms, video tutorials, and information literacy classes. Fourth, libraries need to conduct regular user experience evaluations involving students, lecturers, librarians, and information technology staff.

This study has limitations. It focused on one university library and involved a limited number of participants. Therefore, the findings are not intended for statistical generalization across all higher education libraries. However, the findings can serve as a conceptual and practical reference for libraries with similar service characteristics. Future studies can expand the research sites, compare several university libraries, or combine qualitative and quantitative approaches to examine the relationship between user experience, digital literacy, user satisfaction, and the effectiveness of scholarly information access.

Overall, this study confirms that user experience-based digital library service design is an important strategy for improving access to scholarly information. Access does not only mean the availability of digital collections. It also requires clear service pathways, accessible assistance, simple interfaces, and continuous information literacy support. By placing user experience at the

center of service development, university libraries can play a stronger role in supporting learning, research, and academic knowledge production.

4. Conclusions

This study concludes that user experience-based digital library service design plays an important role in improving access to scholarly information. The findings show that users did not only face technical problems, but also experienced confusion in navigating search tools, accessing full-text documents, using academic search strategies, and finding responsive assistance. These findings confirm that digital library effectiveness depends on the relationship between system design, user literacy, academic needs, and librarian support. The study contributes to the literature by showing that access to scholarly information should be understood as a user-centered process, not merely as the availability of digital collections.

The findings imply that university libraries need to design digital services that are simple, integrated, responsive, and aligned with users' academic tasks. In practical terms, libraries should provide one access point for catalogs, repositories, journal databases, e-books, user guides, and help services. They also need to strengthen information literacy programs, improve mobile-friendly interfaces, and conduct regular user experience evaluations. From a policy perspective, higher education institutions should support digital library development through sustainable funding, staff capacity building, and clear service standards. Future research can compare user experience across several university libraries or use mixed methods to examine the relationship between user experience, digital literacy, satisfaction, and scholarly information access.

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