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EXPLORING STUDENTS' EXPERIENCES IN UTILIZING THE OPAC IN THE MEDAN TOURISM POLYTECHNIC LIBRARY THROUGH THE THINK-A LOUD PROTOCOL

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ABSTRACT

This study aims to explore students' experiences in using the Online Public Access Catalog (OPAC) at the Medan Tourism Polytechnic Library using the Think-Aloud Protocol (TAP) method. A total of 15 students who had used the OPAC at least twice were purposively selected as respondents. Data were collected through observations of collection search tasks and semi-structured interviews, then analyzed using Reflexive Thematic Analysis (RTA) associated with ISO 9241-11 indicators and the Technology Acceptance Model (TAM) framework. The results showed that 70% of students experienced difficulty using the advanced search feature, took an average of five minutes to find a book title, and 60% considered the OPAC interface less intuitive. The main obstacles included an interface that was less user-friendly, low digital literacy, and minimal socialization from librarians. These findings expand the theoretical understanding of the relationship between digital literacy and perceived ease of use in the context of vocational education, while also emphasizing the importance of a user-centered design (UCD) approach in OPAC development. This study recommends simplifying the interface, integrating OPAC training into student orientation programs, and strengthening the role of librarians in digital literacy support, so that OPAC can be optimally utilized to support academic activities.

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1. INTRODUCTION

University libraries are a key pillar in supporting the academic activities of students, lecturers, and researchers. With the rapid development of information technology, libraries are required to provide fast, efficient, and independently accessible services. One manifestation of this digital transformation is the implementation of the Online Public Access Catalog (OPAC) as a key feature in library automation systems. The OPAC allows users to browse collections without relying entirely on librarians and serves as an indicator of the quality of information services (Noushad et al., 2024).

At the Medan Tourism Polytechnic Library, library automation has been implemented through INLIS Lite since 2020 and transitioned to SLiMS in 2022. However, initial visit data indicates that over 65% of students still prefer to ask librarians for assistance in finding collections rather than using the OPAC independently. This phenomenon raises questions about whether the OPAC interface design is sufficiently

user-friendly and appropriate for the needs of vocational students, or whether it actually creates obstacles due to limited digital literacy (Rahmi, 2020; Nyambaka & Mutwiri, 2023).

Previous research indicates that OPAC usability issues are not a local phenomenon. Nyambaka and Mutwiri (2023) found that students at the Technical University of Kenya struggled to navigate the KOHA-based OPAC interface, while Purwaningtyas (2021) reported good System Usability Scale (SUS) scores but did not delve deeply into user experience. Another study using the User Experience Questionnaire (UEQ) confirmed that digital library systems may perform well technically, but this did not always reflect student comfort when interacting with the interface (Parwata et al., 2024). This gap indicates the need for research exploring user experiences through a qualitative approach to understand the subtle yet significant barriers often overlooked by quantitative surveys (Cahyani, 2023; Wibisono, 2023).

Numerous studies exploring the usability of library information systems have been conducted, both in Indonesia and abroad. Purwaningtyas (2021), for example, utilized the System Usability Scale (SUS) to evaluate a library system and obtained "good" results. However, the study did not provide detailed student experiences, thus overlooking minor barriers to system use. I. K. Parwata et al. (2024), using a User Experience Questionnaire (UEQ) and Heuristic Evaluation, also revealed that the digital library system operated well, but student interaction with the OPAC was not a major concern. Globally, Nyambaka & Mutwiri (2023) revealed that students at the Technical University of Kenya faced challenges when using the KOHA-based OPAC interface, particularly regarding terminology and the search process. Rahmi (2020) echoed this sentiment, emphasizing that technical terms in library automation often confuse users and are only understood through direct observation.

Various other studies indicate limitations in evaluations using quantitative approaches. Kangko et al. (2022), for example, focused more on librarians' use of SliMS, thus underrepresenting the experiences of students as primary users. Therefore, qualitative methods are needed that can uncover students' real-life experiences in utilizing the system. The Think-Aloud Protocol (TAP) method is one approach that has been deemed successful. Cahyani (2023) emphasized that TAP is able to highlight the emotions and difficulties faced by students when using the system, while Wibisono (2023) showed that TAP can uncover small but significant obstacles that are often overlooked in quantitative surveys. Hertzum (2024) also explained that the Think-Aloud Protocol method is very effective in directly recording users' cognitive processes, as it can reveal real-life problems, strategies, and experiences not revealed through quantitative surveys.

In addition to the method used, it is also important to understand the theoretical basis supporting system exploration. Library information systems are essentially designed to support collection management activities, circulation services, and provide access to information to users. Noushad et al. (2024) explains that information system evaluation should not only focus on technical performance, but also on actual user experience through methods such as the Think-Aloud Protocol, which can reveal how effective, efficient, easy to understand, and comfortable the system is for users.

To address this gap, this study employed the Think-Aloud Protocol (TAP) method, which allows researchers to directly observe students' cognitive processes while using the OPAC, including search strategies, perceived confusion, and feelings (Hertzum, 2024). This approach combines ISO 9241-11 indicators emphasizing effectiveness, efficiency, and satisfaction, as well as the Technology Acceptance Model (TAM) framework to analyze perceived usefulness (PU) and perceived ease of use (PEOU), which influence system usage intentions (Sayekti, 2019).

The theoretical contribution of this research lies in broadening the understanding of the relationship between digital literacy and PEOU in the context of vocational education, a topic that has been under-explored in the HCI literature (Dix & Abowd, 2014). Practically, the results of this study are expected to inform policy development for user-oriented OPAC services through a user-centered design (UCD) approach, as well as to encourage the integration of digital literacy training into student orientation programs. Thus, this research not only assesses the technical performance of OPACs but also recommends strategic steps to improve the user experience in vocational education libraries.

2. RESEARCH METHOD

This study employed a qualitative approach using the Think-Aloud Protocol (TAP) method as the primary strategy to explore students' experiences using the OPAC at the Medan Tourism Polytechnic Library. This approach was chosen because TAP allows researchers to directly capture students' cognitive processes, search strategies, and obstacles through verbalization when interacting with the system (Hertzum, 2024; Noushad et al., 2024). Compared with quantitative methods such as the System Usability Scale (SUS) questionnaire, TAP is more effective in uncovering minor issues often unidentified through surveys, such as confusion when using filters or subjective perceptions of the interface (Cahyani, 2023).

A total of 15 students were selected using a purposive sampling technique, with the following inclusion criteria: having used the OPAC at least twice, representing diverse study programs and years, and being willing to participate in the full TAP session. This selection aimed to capture the diverse experiences of both beginning students and students more familiar with library services.

The data collection process was carried out in two stages. First, students participated in a TAP session by completing four main tasks: searching for a book by title, browsing the collection by author, checking availability, and determining shelf locations based on search results. During these activities, participants were asked to verbalize their thoughts, strategies, and feelings. The entire process was recorded using a screen recorder and audio recorder to ensure complete data capture. The second phase involved semi-structured interviews to delve deeper into students' experiences regarding perceived ease of use, perceived usefulness, and their level of satisfaction with the OPAC. The interview guide was developed based on ISO 9241-11 indicators, which emphasize effectiveness, efficiency, and user satisfaction (ISO, 2018), as well as the software quality characteristics of ISO/IEC 25010 (2023).

To ensure the credibility of the findings, researcher triangulation was conducted by involving two independent researchers in the coding process and theme discussions. Furthermore, member checking was conducted by asking participants to review the summary interpretation of the research results to minimize interpretation bias (Byrne, 2022). Field notes and screenshots were also used as supporting evidence to strengthen the findings. Data were analyzed using Reflexive Thematic Analysis (RTA), which allows researchers to engage in in-depth reflection at each stage of interpretation. The analysis was conducted through six main steps: data familiarization, initial coding, theme development, theme review, theme naming, and final report preparation (Byrne, 2022). To reduce subjective bias, the analysis results were reviewed by the research team until consensus was reached before being integrated into the discussion.

3. RESULTS AND ANALYSIS

The Online Public Access Catalog (OPAC) is a significant innovation in today's library information systems. The OPAC has replaced the manual card catalogs previously used by students to search collections. Through the OPAC, users can search collections more quickly and obtain detailed information on titles, authors, subjects, shelf locations, and availability status. However, as stated in ISO/IEC 25010 (2023), the quality of an information system depends not only on technological advancements but also on its usability, which includes ease of learning, ease of use, and the system's ability to provide clear feedback. According to Human-Computer Interaction (HCI) theory, the success of an OPAC is influenced by an easy-to-understand interface design and the system's ability to create a satisfying user experience. Therefore, this discussion emphasizes how field findings relate to usability theory, related literature, and previous research.

Based on the findings, this study indicates that students at the Medan Tourism Polytechnic tend to use simple searches focused on keywords. Advanced search features such as subject or category filters are rarely used, resulting in search results that are often too broad and inaccurate. This phenomenon suggests that feature complexity actually hinders users with low digital literacy. The results of this study align with research conducted by Kangko et al. (2017), which revealed that in the SliMS 8.0 Akasia OPAC at the BNPB Library, advanced search features such as ISBN and subject were found to have low usability due to a lack of user understanding. This situation is also supported by research by Saragih & Sayekti (2024) at UIN North Sumatra, which found that OPAC usability was only in the "adequate" category, with a score of 62.3 obtained from the System Usability Scale (SUS). This indicates that the problem of user lack of understanding of search features is not unique to the Medan Tourism Polytechnic but also experienced by students at other higher education institutions.

Based on Think-Aloud Protocol sessions and field observations, the average student faces difficulty finding the necessary collections. Respondents require an average of about five minutes to search for a single book title, despite the effectiveness standards according to ISO 9241-11 (2018) emphasizing that information systems should support users in completing tasks more quickly and efficiently. Several respondents expressed confusion when using the search filter.

One student said, "I don't know how to use this category filter, so I search for books manually one by one." This statement confirms that the system is not yet optimally effective. Seventy percent of questionnaire participants admitted to difficulty searching for books using common keywords, and 60% considered the OPAC interface to be insufficiently intuitive. This impacts usability, requiring students to perform repeated searches or return to the initial page. This phenomenon suggests that feature complexity actually hinders users with limited digital literacy. This situation is similar to research by Rahmi (2020), who found that users spend a long time navigating the OPAC due to a lack of understanding of effective search strategies.

Research on the usability of the KOHA OPAC also shows that new users tend to take longer to complete tasks, especially when there are no clear system instructions (Nyambaka & Mutwiri, 2023).

When viewed from the ISO 9241-11 usability theory, these results indicate problems with three indicators: (1) ineffectiveness in finding collections, (2) limited efficiency due to long search times, and (3) user satisfaction affected by a confusing interface. This perspective is supported by the ISO/IEC 25010 theory, which emphasizes usability as one of the main characteristics of software quality, encompassing aspects of learnability, operability, and user error protection. However, interestingly, research by Ridlo et al. (2024) at the ITSI Library found different results. Using usability indicators such as Usefulness, Efficiency, Effectiveness, Satisfying, Learnability, and Accessibility, they obtained high scores (around 85%), indicating that the OPAC can be usable if the system is properly designed and optimized. This comparison confirms that the low usability of the OPAC at the Medan Tourism Polytechnic is more influenced by system implementation factors and user digital literacy, rather than simply technological shortcomings.

Many respondents needed to access multiple menus or return to the main page to verify information. This indicates that the OPAC interface is not yet fully understandable. These results are supported by research by Wibisono et al. (2023), which showed that access speed and clarity of bibliography display significantly influence the success of information searches. Research by I. K. Parwata et al. (2024) also suggests that systems that do not directly display availability status lead users to repeat searches, which actually slows down the search process.

In addition to lengthy search times, difficulties also arise in understanding filters and collection availability status. Some students prefer to ask librarians directly rather than trying search strategies using the OPAC. This illustrates that the system does not offer a good user experience, particularly in terms of feedback. These results align with Human-Computer Interaction (HCI) theory, which highlights the importance of system input in maintaining user satisfaction. These findings are also supported by research by Purwaningtyas (2021), which revealed that minimal user experience in using the OPAC makes students more comfortable communicating with librarians. Additional support comes from a meta-analysis by Cannanure et al. (2025), which indicates that obstacles in digital interactions often drive students to seek alternative methods, such as manual services.

Variations in digital literacy have been shown to influence students' ability to use the OPAC. Students with good digital skills are able to navigate the system fairly quickly, while new or less experienced students tend to be confused and rely on trial-and-error strategies. This phenomenon aligns with research by Cahyani (2023), which shows that low digital literacy encourages students to use simple search strategies and ignore more complex, advanced features. Thus, it is clear that the success of the OPAC is determined not only by system quality but also by user competence.

In general, the obstacles faced by students at the Medan Tourism Polytechnic in utilizing the OPAC can be grouped into three main factors. First, technical factors include unintuitive interface design and suboptimal system performance. Second, user factors involve limited digital literacy, which prevents students from fully utilizing existing features. Third, inadequate service aspects include the lack of socialization and guidance from librarians regarding OPAC use. These findings confirm that OPAC usability issues are not only technical but also closely related to human aspects and service support.

The results of this study suggest that OPAC development in higher education institutions should be directed toward simplifying and making the interface more intuitive, as well as implementing strategies to enhance students' digital skills through short training sessions and online tutorials. These efforts also require institutional policy support that prioritizes strengthening digital services in library management. Furthermore, the findings of this study enrich the academic discussion on usability by demonstrating that information system effectiveness is influenced not only by technological design but also by user interaction and institutional support, which shape the user experience.

While this study makes important contributions, several limitations should be considered. This study focused solely on students at the Medan Tourism Polytechnic, thus limiting the applicability of the results to other higher education institutions. Furthermore, the applied technique relied solely on the qualitative Think-Aloud Protocol approach, without the use of quantitative tools that could provide additional validation. The limited duration of the study also prevented the depth of variation in system usage from being explored.

Therefore, future research should expand its reach to other institutions, employ a mixed-methods approach, and examine the increasingly important mobile-based OPAC. Furthermore, it is crucial to include the perspectives of librarians as system administrators to gain a more comprehensive picture of the challenges and opportunities in OPAC development. The results of this study can also be analyzed using the Technology Acceptance Model (TAM) framework as proposed by Sayekti (2019). This model explains that user acceptance of a particular technology can be influenced by Perceived Usefulness (PU) and Perceived Ease of Use (PEOU), which shape attitudes, intentions, and actual use. In the context of this

study, students' PU toward the OPAC was quite high because they recognized its usefulness in finding collections. However, PEOU tended to be low due to the perceived confusing interface.

The imbalance between perceived usefulness and ease of use influenced students' neutral attitudes toward the OPAC. This explains why intention to use the system remained low even though students recognized its usefulness. Furthermore, digital literacy served as an external variable influencing PEOU. Students with high literacy were more likely to perceive the OPAC as easy to access, while students with low literacy encountered difficulties, thus reducing their intention to use.

Therefore, this study demonstrates that successful OPAC use is strongly influenced by the synergy between the system, users, and services. The results support previous research and also indicate that OPAC usability issues are a recurring issue in various libraries. Without improved interface design, increased student digital literacy, and librarian support, the OPAC may remain in place but be underutilized by its users. If these three factors can be realized, the OPAC will function not only as a catalog system but also as an effective tool to support students' academic activities.

4. CONCLUSION

This study shows that OPAC usage at the Medan Tourism Polytechnic Library is still dominated by simple keyword-based searches, while the advanced search feature is rarely used due to its perceived complexity. The average student takes about five minutes to find a collection, and the majority (70%) report difficulty using search filters. Key barriers include an unintuitive interface, low digital literacy, and minimal outreach from librarians. These findings indicate that effectiveness, efficiency, and satisfaction—the three main indicators of usability according to ISO 9241-11—have not been fully achieved.

Theoretically, this study enhances the Technology Acceptance Model (TAM) by demonstrating how digital literacy acts as an external variable influencing perceived ease of use (PEOU), thus impacting OPAC usage intentions. This contribution underscores the importance of system design that considers users' digital skill levels, particularly in vocational education settings.

Practically, this study recommends three strategic steps: (1) simplifying the OPAC interface using user-centered design (UCD) principles to make it easier for novice students to use; (2) integrating digital literacy training into student orientation programs to improve system navigation skills from the outset; and (3) enhancing the role of librarians in providing guidance, visual tutorials, and active mentoring. With a collaborative effort between technological improvements, user skill development, and service support, the OPAC has the potential to become an effective tool for supporting independent academic activities.

For future research, the use of mixed methods is recommended to validate qualitative results with quantitative data and broaden generalizability to other library contexts. Furthermore, an in-depth study of mobile-based OPACs could provide additional insights as mobile device use increases among students.

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