



The influence of user interface and user experience quality on Online Public Access Catalog (OPAC) acceptance among students of UINSU campus IV Tuntungan

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Abstract

Background: The Online Public Access Catalog (OPAC) is a core information retrieval service in academic libraries. Its acceptance, however, depends not only on the availability of search functions but also on users' perceptions of interface quality and interaction experience. **Purpose:** This study examines the effect of user interface (UI) and user experience (UX) quality on OPAC acceptance among students of Universitas Islam Negeri Sumatera Utara (UINSU) Campus IV Tuntungan. **Methods:** This quantitative explanatory study involved 99 active students who had used the UINSU Library OPAC. Data were collected through an 18-item, five-point Likert questionnaire measuring UI, UX, perceived ease of use (PEOU), and perceived usefulness (PU). The data were analyzed using descriptive statistics, validity and reliability tests, classical assumption tests, and multiple linear regression, supplemented by robust (HC3) standard errors and bootstrap confidence intervals. **Results:** All variables were rated in the high category (UI, $M = 3.75$; UX, $M = 3.62$; PEOU, $M = 3.70$; PU, $M = 3.73$; OPAC acceptance, $M = 3.72$). UI had a positive and significant effect on OPAC acceptance ($B = 0.598$; $t = 6.836$; $p < 0.001$). UX was positively and significantly associated with OPAC acceptance in the ordinary least squares (OLS) analysis ($B = 0.239$; $t = 2.485$; $p = 0.015$), but not under HC3 robust standard errors ($p = 0.072$); the evidence for UX was therefore sensitive to the inferential method. Jointly, UI and UX were significantly associated with OPAC acceptance ($F = 92.144$; $p < 0.001$) and explained 65.7% of its variance ($R^2 = 0.657$). **Conclusion:** Interface quality is a robust correlate of OPAC acceptance, whereas the contribution of user experience is positive but less certain. The remaining 34.3% of the variance is attributable to factors outside the model.

Keywords:

User interface
User experience
OPAC
Technology acceptance model
Academic library

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INTRODUCTION

OPAC, User Interface, and User Experience

Academic libraries increasingly rely on digital services to support students' access to bibliographic information and collections. One service that connects users directly with library collections is the Online Public Access Catalog (OPAC), which enables users to search bibliographic records and check the availability of items without depending entirely on assistance from librarians. At Universitas Islam Negeri Sumatera Utara (UINSU), the OPAC functions as an information retrieval facility that helps students locate library collections (Saragih & Sayekti, 2024). The quality of this service should therefore be examined from the perspective of the students who use it.

OPAC quality is not determined solely by whether a search function is technically available. During information seeking, students interact with terminology, menus, search fields, filters, result displays, navigation elements, and system feedback. User interface (UI) refers to the components of an interactive system through which information and controls are presented to users, whereas user experience (UX) refers to the perceptions and responses that result from the use or anticipated use of a system (International Organization for Standardization, 2019). A clear interface can reduce the effort required to understand a system, whereas a poor interaction experience may leave users uncertain or uncomfortable when completing search tasks. Silvis et al. (2019) emphasized that the usability of academic library websites is closely related to the

organization and structure of information, particularly to how users navigate and locate information within the interface. Similarly, Li and Liu (2019) showed that digital library evaluation is closely tied to users' interaction with interface- and task-related features, including page layout, website organization, ease of learning, accessibility, and usefulness.

Previous studies show that interface and experience problems remain relevant to OPAC evaluation. Naibaho et al. (2025), for example, reported problems with interface design, confusing navigation, excessive menu options, and search features in the OPAC of Universitas Singaperbangsa Karawang. Najafgholinejad (2023) found that usability problems in a national digital library website were associated with users' understanding of concepts and labels and with the organization of information elements, underscoring the importance of interface structure and information architecture. In a systematic review, Jilani et al. (2026) identified effectiveness as a major usability attribute in academic library website evaluation and user testing as one of the most frequently applied evaluation methods. Together, these studies indicate that the way an OPAC is presented and experienced remains an important aspect of library service evaluation.

The UINSU OPAC has also been examined from a user-oriented perspective. Saragih and Sayekti (2024) evaluated the usability of the UINSU Library OPAC with the System Usability Scale among 60 users and obtained a score of 62.3, categorized as "OK" with a grade of D. In a comparable regional setting, Siregar and Sayekti (2025) used the think-aloud protocol to explore

students' experiences with the OPAC of the Medan Tourism Polytechnic Library and identified difficulties with advanced search as well as perceptions that the interface was insufficiently intuitive. These findings provide a relevant local context for examining the OPAC from a different analytical perspective, namely, the relationship between UI and UX quality and technology acceptance.

During preliminary unstructured observations conducted in January 2026 at the UINSU Campus IV Tuntungan Library, the researchers observed approximately 20 visiting students across multiple observation sessions in the catalog retrieval area. A notable number of students bypassed the available OPAC terminals and either searched for collections directly on the open shelves or requested direct assistance from library staff. This observation was not treated as statistical evidence of low acceptance because it did not constitute a structured measurement of the student population. Instead, it served as an initial empirical indication that a systematic study of students' perceptions of the OPAC interface and of their interaction experience was warranted. The study therefore focuses on respondents with direct experience of the UINSU Library OPAC.

Technology Acceptance Model and OPAC Acceptance

The Technology Acceptance Model (TAM) provides a theoretical framework for examining users' acceptance of information technology. Davis (1989) identified perceived usefulness (PU) and perceived ease of use (PEOU) as the central determinants of technology acceptance.

PEOU refers to the degree to which a person believes that using a system will be free of effort, whereas PU refers to the degree to which a person believes that using a system will enhance his or her task performance.

TAM is relevant to digital library research because interface characteristics can be treated as external variables associated with users' acceptance perceptions. In academic libraries, Moorthy et al. (2019) found that factors related to digital library characteristics and to users were associated with undergraduates' behavioral intention to adopt digital library services, which supports the relevance of examining user perceptions in this context. Thong et al. (2002) examined how interface characteristics, including terminology, screendesign, and navigation, related to digital library acceptance, and Hong et al. (2002) investigated the relationships between digital library system characteristics and users' acceptance perceptions, including PEOU. More recently, Soltani-Nejad et al. (2020) found that system quality, service quality, and information quality were important in shaping the PU and PEOU of digital library users.

Recent evidence further supports the relevance of TAM in digital library contexts. In a meta-analysis of technology acceptance in mobile and digital libraries, Ali and Warraich (2024) reported large effect sizes for the relationships of PU and PEOU with behavioral intention and attitude, and medium relationships between system quality and both PU and PEOU. Riady et al. (2025) integrated TAM with the Information Systems Success Model and found that, among Indonesian Open University students, PU was the

strongest determinant of digital library use, whereas PEOU most strongly influenced user satisfaction. In an OPAC-specific study of 400 students with OPAC experience, Fernanda et al. (2025) integrated TAM with the Value-Based Adoption Model, identified enjoyment as the most important predictor of acceptance, and recommended that OPAC development also attend to the user interface. These studies confirm the relevance of technology acceptance to digital library and OPAC research. The present study differs from them by examining UI and UX simultaneously as explanatory variables and by operationalizing OPAC acceptance through PEOU and PU.

UX Dimensions and Previous OPAC Studies

UX, the second independent variable in this study, extends beyond the visual appearance of a system to the perceptions and responses that users develop through interaction. The User Experience Questionnaire (UEQ) introduced by Laugwitz et al. (2008) comprises six dimensions: attractiveness, perspicuity, efficiency, dependability, stimulation, and novelty. Questionnaire-based UX evaluation has also been applied in digital libraries to capture users' perceptions of and interactions with these systems (Kuhar & Merčun, 2022). The present study focuses on two of these dimensions. Attractiveness reflects users' overall impression of the system, whereas dependability concerns the extent to which users feel in control of the interaction and can anticipate the system's behavior. Research on academic library websites likewise emphasizes the importance of understanding users'

perceptions and needs; using a user-centered approach, Naughton (2023) found that library users valued website content but also raised concerns about design, content consistency, and access.

Library studies in Indonesia reinforce the relevance of UX to OPAC evaluation. Shaleha et al. (2023) analyzed the UX of the OPAC at UIN Sunan Kalijaga Yogyakarta and highlighted the importance of users' experience in interacting with OPAC services. Hardiyanto et al. (2021) demonstrated that library website quality is related to user satisfaction, and Rizkyana et al. (2021) examined usability and ease of use in a digital library application. Research on library user engagement has similarly shown the value of examining the conditions that shape users' interactions with library spaces and services (Prijana et al., 2026). Beyond Indonesia, Omotayo and Haliru (2020) found significant relationships between technology characteristics, task characteristics, user-related factors, and digital library use among undergraduates. Although these studies address related user-oriented constructs, none specifically tests the simultaneous effects of UI and UX on OPAC acceptance among UINSU students with PEOU and PU as the acceptance dimensions.

Recent evidence also identifies usability as a persistent issue in OPAC use. In a study of university students' information discovery practices, Shimray et al. (2025) found a diminishing dependence on OPACs associated with usability concerns, as students preferred alternatives that they perceived as clearer, easier to use, and more accessible. This finding strengthens the rationale for examining how users perceive

the interface and the interaction experience of OPAC services.

Research Gap, Novelty, and Hypotheses

The distinction between UI, UX, and acceptance is central to this study. UI and UX are treated as independent variables that describe the characteristics and experiences perceived by students during their interaction with the OPAC. PEOU and PU are not treated as additional independent variables; instead, they operationalize the dependent construct of OPAC acceptance within the TAM framework. The acceptance score is calculated as the mean of the PEOU and PU scores, which allows the study to examine whether students who perceive the interface and the interaction experience more positively also report higher acceptance of the OPAC.

The three UI indicators were selected because they represent different points of contact between students and the OPAC. Terminology clarity concerns the language used in labels, menus, and other interface elements. Terminology is particularly important in information retrieval because users approach a catalog with an information need rather than with technical knowledge of the system; a clear label allows them to form an accurate expectation of the action that will follow. Screen design concerns the arrangement and presentation of information, including search results and interface elements, whereas navigation clarity concerns whether users can recognize the available paths and understand what to do next.

The UX indicators address a different layer of interaction. Attractiveness captures the overall impression generated by using

the OPAC, whereas dependability captures the user's sense of control and predictability. A student may technically complete a search yet still perceive the interaction as confusing or uncertain; conversely, an interaction that feels predictable and controllable may strengthen confidence in the system. This distinction justifies treating UX as a separate explanatory variable rather than as another name for interface design.

The dependent construct was deliberately operationalized through PEOU and PU rather than through actual frequency of use, in line with the study's TAM framework and its focus on acceptance perceptions. PEOU addresses the effort associated with learning and operating the OPAC, whereas PU addresses the usefulness of the system for information search tasks. Averaging these two constructs yields a composite acceptance score that serves as the study's operational definition of acceptance. This approach does not imply that PEOU and PU exhaust all dimensions of technology acceptance; they are simply the dimensions selected for this study.

The novelty of this study lies in combining UI and UX as explanatory variables in a single quantitative model of OPAC acceptance in the UINSU context. Earlier research has examined OPAC usability, UX, interface characteristics, or technology acceptance largely in isolation, whereas the present study places UI and UX together in a multiple regression model and operationalizes OPAC acceptance through PEOU and PU. The focus on UINSU Campus IV Tuntungan also provides an empirical context that complements previous UINSU research based on usability measurement.

The study is relevant to library and

information science because the OPAC is a core information retrieval service in academic libraries. Understanding the relationships among interface quality, user experience, and acceptance can help library managers interpret students' interactions with digital catalog services as part of the broader quality of information services. The findings may also help identify the interface and interaction aspects that deserve attention in future OPAC development, without reducing evaluation to technical performance alone.

On the basis of these theoretical and empirical considerations, the research question is formulated as follows: Do UI and UX significantly affect OPAC acceptance among students of UINSU Campus IV Tuntungan, both partially and simultaneously? Accordingly, this study analyzes the effect of UI and UX on OPAC acceptance, measured through PEOU and PU within the TAM framework, and tests three hypotheses:

H1: UI has a positive and significant effect on OPAC acceptance.

H2: UX has a positive and significant effect on OPAC acceptance.

H3: UI and UX simultaneously have a significant effect on OPAC acceptance.

The conceptual framework of the study is presented in Figure 1. UI and UX are conceptualized as independent variables associated with OPAC acceptance, which is operationalized through PEOU and PU on the basis of TAM. The framework assumes that students' perceptions of the OPAC interface and of their interaction experience are associated with the perceived ease of use and the perceived usefulness of the system.

RESEARCH METHODS

Research Design and Setting

This study used a quantitative approach with an explanatory research design (Creswell & Creswell, 2018). This design was selected because the study aimed to examine the effect of two independent variables, UI (X₁) and UX (X₂), on one dependent variable, OPAC acceptance (Y). The research was conducted at UINSU

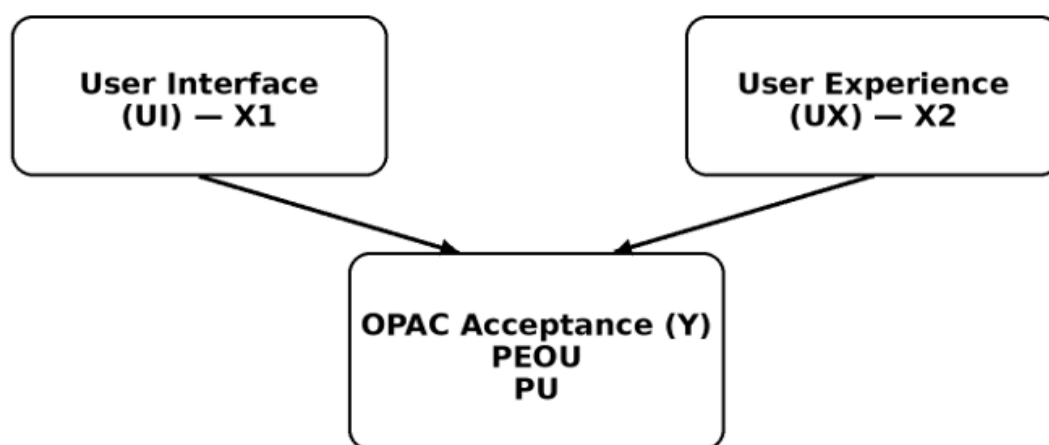


Figure 1. Conceptual framework of the study

Source: Developed by the authors based on Davis (1989), Thong et al. (2002), and Laugwitz et al. (2008)

Campus IV Tuntungan, with the UINSU Library OPAC as the object of study. The research took place between February and March 2026; specifically, the instrument pilot test was conducted in February 2026 ($n = 30$), and the main empirical survey administration was conducted from late February to March 2026 ($n = 99$).

Population and Sample

The population consisted of active students of UINSU Campus IV Tuntungan who had used the UINSU Library OPAC. The population was limited to users with direct OPAC experience because evaluating interface quality, interaction experience, and acceptance requires actual exposure to the system. Respondents were selected through purposive sampling according to three inclusion criteria: (1) being an active student of UINSU Campus IV Tuntungan, (2) having used the UINSU Library OPAC at least once, and (3) completing the questionnaire voluntarily and in full.

Because the number of students who had used the UINSU OPAC was unknown, the minimum sample size was determined with the Lemeshow formula for an unknown population, $n = Z^2P(1 - P)/d^2$ (Lemeshow et al., 1990). With a 95% confidence level ($Z = 1.96$), an estimated proportion of $P = 0.50$, and a margin of error of $d = 0.10$, the calculation yielded a minimum sample of 96.04, which was rounded up to 97 respondents. The researchers collected 100 responses to anticipate incomplete or ineligible submissions. During data cleaning and screening, one response was removed because the respondent had never used the UINSU Library OPAC. Consequently, exactly 99 valid responses

fulfilled all inclusion criteria and were retained for the final empirical analysis.

Research Instrument

The research instrument was a closed questionnaire consisting of 18 statements rated on a five-point Likert scale (1 = strongly disagree, 2 = disagree, 3 = neutral, 4 = agree, 5 = strongly agree). UI was measured with six items, two for each of three indicators: terminology clarity, screen design, and navigation clarity. UX was measured with four items, two for each of two indicators: attractiveness and dependability.

OPAC acceptance was measured with eight items representing two TAM constructs. PEOU comprised four items assessing the perceived ease of learning, understanding, operating, and searching the OPAC. PU comprised four items assessing the perceived usefulness of the OPAC for finding collection information, improving search effectiveness, obtaining information efficiently, and meeting information needs. Each construct score was first calculated from its item responses, and the acceptance score was then calculated as the mean of the PEOU and PU scores.

The operationalization of the variables, summarized in Table 1, was based on the study's theoretical framework. The UI indicators were adapted from the interface characteristics examined by Thong et al. (2002), the UX indicators were adapted from the attractiveness and dependability dimensions of the UEQ (Laugwitz et al., 2008), and the PEOU and PU items were based on TAM (Davis, 1989). The wording of the items was contextualized to the UINSU OPAC so that respondents evaluated the

Table 1. Operationalization of variables

Variable	Operational definition	Indicators	Items	Source
UI (X1)	Students' perception of OPAC interface characteristics.	Terminology Clarity; Screen Design; Navigation Clarity	6	Thong et al. (2002)
UX (X2)	Students' perception of their experience while interacting with OPAC.	Attractiveness; Dependability	4	Laugwitz et al. (2008)
OPAC Acceptance (Y)	Students' perceived ease and usefulness of the OPAC.	PEOU; PU	8	Davis (1989)

Source: Compiled by the authors based on Davis (1989), Thong et al. (2002), and Laugwitz et al. (2008)

system that they had actually used.

Before the main survey, the instrument was pilot-tested with 30 respondents. Item validity was assessed with the corrected item-total correlation, and items with values greater than 0.30 were retained. Reliability was assessed with Cronbach's alpha, with a coefficient of at least 0.70 taken as the criterion for adequate internal consistency. All 18 items met the validity criterion, and every construct achieved a Cronbach's alpha above 0.70.

Data Collection and Analysis

Primary data were collected through an online questionnaire administered via Google Forms to students who met the inclusion criteria. The survey link was distributed through student academic WhatsApp class groups across faculties, official student library communication networks, and on-site QR code flyers displayed directly beside the OPAC search terminals at the UINSU Campus IV Tuntungan Library. Informed consent was obtained electronically on the introductory page of the questionnaire; participants were informed about the study's background,

voluntary participation, assured anonymity, and confidential data handling before providing their consent to proceed. Secondary data were obtained from relevant books, journal articles, and scholarly publications on UI, UX, OPAC evaluation, and TAM.

The statistical analysis comprised descriptive statistics, validity and reliability testing, classical assumption testing, multiple linear regression, partial significance testing with the t -test, simultaneous significance testing with the F -test, and the coefficient of determination (R^2). Descriptive and classical linear regression analyses were conducted using IBM SPSS Statistics (Version 26). To examine the sensitivity of the regression inferences against potential distribution departures and heteroscedasticity, two supplementary analyses were conducted: heteroscedasticity-consistent HC3 standard errors (Long & Ervin, 2000) and case-resampling bootstrap confidence intervals based on 10,000 resamples, estimated with the percentile method (Efron & Tibshirani, 1993). Both robust estimations were performed using R (Version 4.3.2) via the sandwich and boot packages.

RESULTS AND DISCUSSION

Respondent Characteristics

The final analysis involved 99 respondents from seven study programs at UINSU Campus IV Tuntungan (Table 2). Students of library and information science constituted the largest group (57 respondents; 57.58%), followed by students of communication science (17.17%) and computer science (13.13%). This distribution is reported to describe the composition of the sample, not to support comparisons between study programs.

The concentration of respondents in library and information science may have influenced the findings because these students are likely to be more familiar with library services and OPAC use than students from other programs. The findings should therefore be interpreted in light of the sample composition, and their generalizability to

the wider UINSU student population may be limited. Future research could include a more proportionate representation of study programs to examine whether the observed relationships hold across groups.

Instrument Validity and Reliability

Table 3 presents the results of the validity and reliability tests computed on the main research dataset (n = 99), confirming that the psychometric properties established in the pilot stage remained stable and robust. All questionnaire items met the validity criterion of a corrected item–total correlation greater than 0.30. The coefficients ranged from 0.519 to 0.687 for UI, from 0.628 to 0.768 for UX, from 0.504 to 0.734 for PEOU, and from 0.777 to 0.900 for PU, indicating that each item contributed adequately to the measurement of its construct.

Table 2. Respondent distribution by study program

Study program	Frequency	Percentage
Library and Information Science	57	57.58%
Communication Science	17	17.17%
Computer Science	13	13.13%
Islamic Banking	7	7.07%
Public Health	3	3.03%
History of Islamic Civilization	1	1.01%
Religious Sociology	1	1.01%
Total	99	100%

Source: Research data, 2026

Table 3. Validity and reliability results

Construct	Corrected item–total correlation	Cronbach’s alpha	Decision
UI	0.519–0.687	0.801	Valid and reliable
UX	0.628–0.768	0.850	Valid and reliable
PEOU	0.504–0.734	0.806	Valid and reliable
PU	0.777–0.900	0.932	Valid and reliable

Source: Research data, 2026

Reliability testing likewise showed acceptable internal consistency, with Cronbach's alpha values of 0.801 for UI, 0.850 for UX, 0.806 for PEOU, and 0.932 for PU. The considerably higher coefficient for PU indicates strong consistency among its four items. A high alpha, however, is evidence of internal consistency rather than proof of construct validity; the validity results and the theoretical alignment of the items were therefore considered together in retaining the instrument.

Descriptive Findings

The descriptive statistics in Table 4 indicate that students generally assessed the OPAC positively. Of the two independent variables, UI obtained the higher mean ($M = 3.75$), followed by UX ($M = 3.62$). PEOU and PU obtained means of 3.70 and 3.73, respectively, resulting in an overall OPAC acceptance mean of 3.72. All variables fell into the high category.

Of the two independent variables, UI obtained the higher mean ($M=3.75$), followed by UX ($M=3.62$). PEOU and PU obtained means of 3.70 and 3.73, respectively, resulting in an overall OPAC acceptance mean of 3.72. The PEOU mean indicates that respondents generally agreed that the OPAC is easy to learn and operate, and the slightly higher PU mean suggests that they perceived the OPAC as useful for information search. Because the two dimensions were combined into the acceptance measure, its mean reflects a balance between perceived ease and perceived usefulness. This result provides important context for the regression analysis: the model explains variation in an acceptance construct that respondents

generally rated positively.

Classical Assumption Testing

The normality tests on the regression residuals were significant (Kolmogorov–Smirnov, $D=0.197, p<0.001$; Shapiro–Wilk, $W=0.899, p<0.001$), indicating that the residuals departed from a normal distribution. Multicollinearity was not problematic, as both UI and UX exhibited a tolerance of 0.427 and a variance inflation factor (VIF) of 2.344, well below the conventional threshold of 10. Visual inspection of the residual scatterplot revealed no extreme systematic funnel shape, and the maximum Cook's distance was 0.211, indicating no unduly influential outliers.

However, a formal Breusch–Pagan test for heteroscedasticity was statistically significant ($BP=6.42, df=2, p=0.040$), indicating the presence of mild heteroscedasticity in the residuals that subtle visual inspections alone did not detect. This mild heteroscedasticity accounts for the inflation in the standard error of UX under robust estimation, where the HC3 robust standard error was roughly one-third larger than the OLS standard error and increased the p -value from 0.015 to 0.072. This statistical outcome directly justifies the application of HC3 heteroscedasticity-consistent estimators and non-parametric bootstrap resampling to evaluate hypothesis robustness.

Multiple Regression Results

The multiple regression results are summarized in Table 5. The model produced $R = 0.811$, $R^2 = 0.657$, adjusted $R^2 = 0.650$, and a standard error of the

estimate of 0.359. The F statistic was 92.144 ($p < 0.001$), indicating that UI and UX were jointly and significantly associated with OPAC acceptance in the sample. The regression equation was $Y = 0.606 + 0.598X_1 + 0.239X_2$. The positive coefficients indicate that higher UI and UX scores were associated with higher predicted OPAC acceptance scores within the fitted model.

Specifically, the UI coefficient indicates that, with UX held constant, a higher UI score was associated with a higher predicted acceptance score; the UX coefficient indicates the same relationship with UI held constant. The significance of the overall model indicates that the two predictors jointly explain variation in acceptance. These statements describe statistical relationships in the observed sample; they do not establish that changing a single interface feature would produce a particular increase in acceptance in practice.

Partial Effects and Hypothesis Testing

The results of hypothesis testing are presented in Table 6. UI had an unstandardized coefficient of $B = 0.598$,

a standardized coefficient of $\beta = 0.625$, $t = 6.836$, and $p < 0.001$; H1 was therefore supported. The OLS analysis also indicated a positive and significant association between UX and OPAC acceptance ($B = 0.239$, $\beta = 0.227$, $t = 2.485$, $p = 0.015$). The simultaneous F test supported H3 because the model was significant at $p < 0.001$.

To examine the sensitivity of these findings to the method of inference, supplementary analyses with HC3 standard errors and bootstrap confidence intervals were conducted. With HC3 standard errors, the UI coefficient remained significant ($p < 0.001$), whereas the UX coefficient was not significant at the 5% level ($p = 0.072$). The 95% percentile bootstrap confidence intervals were 0.364–0.798 for UI and 0.007–0.478 for UX. Although both intervals excluded zero, the lower bound for UX lay only marginally above zero, and its inference differed between the HC3 test and the bootstrap interval. The evidence for UX was thus sensitive to the inferential method, whereas the finding for UI was consistent across all methods examined. Support for H2 is therefore conditional, and the relationship between UX and OPAC acceptance should be interpreted

Table 5. Multiple regression results

Statistic	Value
R	0.811
R ²	0.657
Adjusted R ²	0.650
Std. error of the estimate	0.359
F	92.144
p (F test)	< 0.001
UI: B / β / p	0.598 / 0.625 / < 0.001
UX: B / β / p	0.239 / 0.227 / 0.015
Regression equation	$Y = 0.606 + 0.598X_1 + 0.239X_2$

Source: Research data, 2026

with caution.

The standardized coefficients show that UI ($\beta = 0.625$) contributed more strongly than UX ($\beta = 0.227$) within this model. This result is consistent with UI having the higher mean of the two independent variables, but the two findings answer different questions: the mean describes the level of perception, whereas the standardized coefficient describes the relative contribution of a predictor within the regression model. The comparison should therefore be read as a model-specific result under the present measurement and sample conditions, not as a general ranking of UI and UX in all OPAC contexts.

Discussion of User Interface

The findings indicate that UI quality was positively and significantly associated with OPAC acceptance among students of UINSU Campus IV Tuntungan ($B = 0.598$, $\beta = 0.625$, $p < 0.001$). Students who evaluated the OPAC interface more positively also tended to report higher acceptance, and the UI mean of 3.75 indicates that respondents generally perceived the interface favorably.

This finding can be explained through TAM (Davis, 1989), which identifies PEOU and PU as the central constructs of technology acceptance. In this

study, interface characteristics such as terminology clarity, screen design, and navigation clarity are plausibly related to students' perceptions of how easily they can operate the OPAC and how useful it is for information search. Understandable terminology and clear navigation may reduce the effort required to use the system, while an organized screen design may help students identify search functions and interpret results more efficiently. These characteristics are therefore relevant to both PEOU and PU, which together operationalize OPAC acceptance in this study.

The finding is also consistent with Thong et al. (2002), who examined the roles of terminology, screen design, and navigation in digital library acceptance, and with Hong et al. (2002), who examined the relationships between digital library system characteristics and users' acceptance perceptions, including PEOU. These studies provide a theoretical and empirical basis for interpreting the relationship between interface characteristics and technology acceptance in the digital library context.

Taken together, the findings suggest that UI quality is an important correlate of OPAC acceptance among the surveyed students. Because the study used a cross-

Table 6. Hypothesis testing

Hypothesis	Test result	Decision
H1: UI -> OPAC acceptance	$t = 6.836$; $p < 0.001$	Supported
H2: UX -> OPAC acceptance	$t = 2.485$; $p = 0.015$	Supported in conventional OLS; sensitive to HC3
H3: UI + UX -> OPAC acceptance	$F = 92.144$; $p < 0.001$	Supported

Note: H2 was supported in the OLS analysis, but the UX coefficient was not significant with HC3 robust standard errors ($p = 0.072$).

Source: Research data, 2026

sectional survey, however, the relationship should be interpreted as an association rather than as definitive evidence that improvements in UI alone cause higher acceptance. For academic library managers, the results highlight the value of evaluating terminology, screen organization, and navigation from the users' perspective when reviewing OPAC usability and service quality.

Discussion of User Experience

The UX mean of 3.62 fell into the high category, indicating generally positive perceptions, although it was lower than the UI mean. The positive OLS coefficient for UX ($B = 0.239$, $\beta = 0.227$) suggests that acceptance is related not only to whether users can locate menus and search functions but also to the quality of the experience formed during interaction. Attractiveness reflects whether the system creates a favorable overall impression, whereas dependability concerns users' perceptions of control, certainty, and predictability. Both aspects can affect whether students feel comfortable and confident when using the OPAC for information search tasks.

As reported above, however, the statistical significance of the UX coefficient depended on the inferential method, and the relationship between UX and OPAC acceptance should therefore be regarded as tentative. One plausible explanation is the strong correlation between UI and UX (tolerance = 0.427), which implies that much of the variance in UX overlaps with that of UI and leaves relatively little unique variance to predict acceptance. Even so, the direction of the finding is consistent with previous OPAC research that has identified

interaction experience as an important component of user evaluation (Shaleha et al., 2023). It also supports the argument that digital library services should consider the experiential dimension of interaction rather than evaluating interfaces only in terms of visual arrangement or functional availability.

Discussion of the Simultaneous Model

The simultaneous model produced $R^2 = 0.657$, meaning that UI and UX together accounted for 65.7% of the variance in the OPAC acceptance score. The remaining 34.3% is attributable to factors outside the model. Acceptance is therefore not explained exclusively by interface characteristics or experience, but the two constructs jointly provide substantial explanatory power within this sample and measurement model. Factors outside the model may include individual differences, information search habits, prior technology experience, perceived information quality, system performance, and library service factors, none of which were measured in the present study.

The combined result is important for library service evaluation because UI and UX describe related but distinguishable aspects of user-system interaction. UI concerns the characteristics of the interface that students encounter, whereas UX captures the perceptions and responses formed through interaction. Treating both as explanatory variables allows the study to examine whether acceptance is associated with the visual and navigational characteristics of the interface as well as with the broader experience of using the system. The model thus provides an empirical

bridge between interface evaluation and technology acceptance in the context of an academic library OPAC.

For library managers, the findings suggest that OPAC evaluation can be linked directly to the user perspective. A review of terminology, screen organization, and navigation can be accompanied by an assessment of whether users feel comfortable, in control, and confident while searching. Service improvement can therefore combine interface review with periodic user feedback rather than treating these as unrelated activities. Although the findings do not prescribe a particular technical redesign, they provide evidence that both the interface and the experience associated with it are relevant to students' acceptance perceptions.

Future studies could extend the model with variables outside the present design. The unexplained 34.3% of the variance should not be attributed to a single omitted factor; it represents the combined contribution of all influences not captured by UI and UX, together with random error. Future research may examine information quality, system quality, service quality, digital literacy, prior experience, perceived security, search performance, or behavioral intention where these constructs are theoretically justified. A larger and more diverse sample would also provide a stronger basis for comparing user groups.

Methodological Limitations

This study has several methodological limitations. First, the regression residuals were not normally distributed (Kolmogorov–Smirnov, $D=0.197, p<0.001$; Shapiro–Wilk, $W=0.899, p<0.001$). To

assess the robustness of the results, HC3 standard errors and bootstrap confidence intervals were examined; these analyses showed that the association between UI and OPAC acceptance was robust, whereas the association between UX and OPAC acceptance was sensitive to the inferential method. Second, the study relied on purposive sampling and a cross-sectional design, and the sample was dominated by Library Science students (57.58%). The findings therefore cannot be generalized to the entire UINSU student population and should not be taken as evidence of a causal relationship.

Third, because all variables were measured through a single self-report survey administered at a single point in time, the data may be susceptible to common method bias (Podsakoff et al., 2012). Fourth, there exists potential conceptual overlap between the dependability dimension of UX (measuring users' feelings of control and predictability) and TAM's perceived ease of use (capturing effortlessness of operation), which may have inflated the observed inter-construct correlation and contributed to shared variance between predictors and outcomes. Future studies should employ multi-method designs, objective behavioral logs, and longitudinal tracking to substantiate self-reported acceptance measures.

CONCLUSION

This study examined the relationship between UI and UX quality and OPAC acceptance among students of UINSU Campus IV Tuntungan. Students generally perceived the OPAC's interface, user

experience, and acceptance positively. UI was positively and significantly associated with OPAC acceptance, and this association was robust across all inferential methods. UX was also positively associated with acceptance, but its statistical significance depended on the inferential method; this part of the evidence is therefore tentative. Together, UI and UX explained 65.7% of the variance in acceptance, which suggests that interface characteristics and users' interaction experience are relevant to their perceptions of the system's ease of use and usefulness.

These findings provide practical insights for academic library managers seeking to evaluate and improve the terminology clarity, screen design, navigation, and interaction quality of their OPACs on the basis of users' needs. Because the study used purposive sampling and the regression residuals did not meet the conventional normality criterion, the findings should be interpreted with caution. Future research could involve larger and more diverse samples, examine additional factors associated with OPAC acceptance, and apply appropriate methods to assess the robustness of statistical inferences.

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Authors' Contributions

Conceptualization, V.A. and Y.; methodology, V.A. and Y.; formal analysis, V.A.; investigation, V.A.; data curation, V.A.; writing — original draft preparation, V.A.; writing — review and editing, V.A. and Y.; supervision, Y.; project administration, V.A.

All authors have read and agreed to the published version of the manuscript.

AI Declaration

The authors used ChatGPT (OpenAI) and DeepL to assist with English translation, language editing, and manuscript drafting based on the authors' research materials. These tools were not used to collect data, conduct the statistical analysis, or generate research data. The authors reviewed the manuscript and take full responsibility for the accuracy, integrity, interpretation, and final content of the article.

Data Availability Statement

The data supporting the findings of this study are available from the corresponding author upon reasonable request, subject to privacy and research ethics considerations.

Conflicts of Interest

The authors declare no conflicts of interest.

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