

Evaluating User Satisfaction with Digital Library Services: A Study of Academic Libraries in Higher Education Institutions

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ABSTRACT

The transformation of libraries from traditional physical spaces to dynamic online knowledge hubs, commonly referred to as digital libraries, has significantly reshaped the landscape of information access and management. This shift is particularly pronounced in higher education institutions, where digital libraries have become essential repositories of scholarly content and services, offering curated collections that ensure both accessibility and quality. The study investigated student satisfaction with digital library services at higher education institutions in Bukit Cherakah, Selangor, focusing on the relationship among key service attributes—information quality, system quality, and service quality—and overall student satisfaction. Using a survey research methodology, this study collected data from a representative sample of 384 students across various education levels and disciplines, employing a Likert scale to gauge satisfaction levels. The findings are expected to identify critical factors that influence student satisfaction, offering insights for enhancing digital library services to better meet the evolving needs of users. By addressing the gap in understanding user satisfaction and utilization patterns, particularly in higher education institution, this research contributes to the ongoing development of more effective and user-centered digital library platforms in higher education.

Keywords: digital libraries, user satisfaction, information quality, system quality, higher education

INTRODUCTION

The evolution of libraries from traditional physical spaces to dynamic online knowledge hubs, known as digital libraries, reflects the changing landscape of information access and management. Digital library that transforms the physical library has offered digital collection and services such as e-books, e-journal and many more (Chan and Spodick, 2016). Digital libraries curate vast collections managed by skilled professionals, ensuring resources are not only widely accessible but also carefully maintained to meet user needs (Abu Bakar et al., 2021). This transformation is particularly impactful in higher education institutions, where digital libraries serve as critical repositories for scholarly content and services. By offering digital alternatives to traditional print resources, these platforms cater for the evolving needs of students and researchers.

Beyond institutional boundaries, digital library services continue to expand through the integration of commercial library management systems and third-party resources such as federated search engines and scholarly databases, enhancing the quality and efficiency of services (Trivedi et al., 2021). These advancements aim to support students' academic endeavors by providing seamless and convenient access to essential materials (Suharto et al., 2021). The comprehensive digital library services will assist the librarian to effectively manage, organize and disseminate the digital content, user experience as well as resource management within the library (Liabor, 2023). However, despite these innovations, studies such as Zaki et al. (2023) highlight a gap in understanding user satisfaction and utilization patterns within higher education settings. Recognizing the pivotal role of user satisfaction in the success of digital libraries, this study seeks to explore the factors influencing student satisfaction with digital library services.

Academic libraries play a vital role in supporting research, teaching, learning, and community services within

academic institutions by providing essential information services and resources. To meet the diverse needs of users, it is critical to standardize the quality of these resources and services, ensuring they align with user expectations. Libraries must actively engage with their users to assess the suitability of programs and information resources, as user satisfaction is closely linked to the quality of services provided. According to Suharto and Abdul Kadir (2021), the performance of academic libraries is significantly influenced by the quality of services they offer. Assessing user satisfaction with future library developments requires a thorough examination of the quality of information, services, and systems provided. Although prior research has primarily focused on the impact of individual factors and the adoption of e-libraries, there is a noticeable gap in studies assessing user satisfaction concerning various quality dimensions, such as information quality, system quality, and service quality. Meanwhile, a study by Younus and Dilshad (2021) highlighted significant issues users face when interacting with libraries that lack adequate e-resources, leading to low engagement and underutilization of digital libraries. This study emphasized the importance of understanding these factors to foster greater digital library usage. The student prefers to use Google and internet resources than digital library system because the student believes that platform faster and ease to use to find information (Alpan & Avci, 2019). This preference suggests that digital library websites may be seen as less accessible or containing outdated or irrelevant content. Furthermore, research by Abu Bakar et al. (2021) pointed to a lack of exploration into the specific factors, such as service and system quality, that contribute to users' dissatisfaction with digital library services. Complicated search interfaces and difficult navigation are among the factors that may lead users to perceive digital library websites as less intuitive or user-friendly, highlighting the need for improvements in these areas to enhance user satisfaction.

Suharto and Abdul Kadir (2021) highlight the seamless user experience provided by non-digital library services, characterized by responsiveness, accessibility, and reliability, which contribute to higher levels of user satisfaction. Users particularly appreciate the ability to access information instantly from any device with an internet connection. In contrast, digital library services may face challenges such as technological issues, limited accessibility, or slow loading times, all of which can negatively impact students' satisfaction of the overall quality of these services. This disparity between the library's internal performance metrics and user expectations can lead to a situation where the library meets its own standards but falls short in the eyes of its users.

Given this potential disconnect, it is crucial for library managers to prioritize understanding and anticipating user satisfaction in relation to service quality (Cristobal, 2018). To accurately assess user satisfaction with digital library services, researchers emphasize the need for a comprehensive evaluation of information quality, system quality, and service quality, ensuring that the users' perspectives are fully considered. Khan et al. (2018) further asserts that using quality assessments as a basis for evaluating library performance not only aids in identifying areas for improvement but also aligns the library's services more closely with user expectations. The researchers advocate for a user-centered approach, recognizing that the user is the most critical factor in determining service quality.

Therefore, this study is to evaluate student satisfaction with the digital library services provided by higher education institutions in Bukit Cherakah, Selangor. Specifically, the objective of this paper is to examine the relationship between key aspects of digital library services which are information quality, system quality, and service quality as well as overall student satisfaction. By analyzing these variables, the study aims to identify critical factors influencing student contentment and provide actionable insights to enhance digital library services, ensuring they better meet user needs and expectations. Besides that, this study was conducted to make sure the students have full experience in using digital library services in current academic library environments. The evaluation on the digital library services will assist the academic library management to find alternative ways such as adopting artificial intelligence (AI) or any advancement technology for further improvement in the digital library.

LITERATURE REVIEW

Digital Literacy

Many organizations, particularly higher education institutions in developing countries, have increasingly adopted digital libraries since the 1990s. This shift reflects significant advancements in information management

and system technology, which have transformed learning and library environments (Suharto & Abdul Kadir, 2021). According to Mahmood et al. (2022), the transition from physical to digital libraries has profoundly impacted research practices within academic institutions, offering new ways to access and manage information. Digital libraries represent a state-of-the-art library service that leverages information technology to enhance access and usability (Nejad et al., 2020). As described by Rahman and Mohezar (2020), a digital library is an online repository that utilizes network technologies to collect, create, store, distribute, and maintain a range of digital assets, including text, images, audio, and video. A digital library is an electronic collection of physical or virtual resources that focus on specific fields or discipline that allow user to access online or offline, often include multimedia and multilingual data (Bansode, N., & Shinde, 2019). Unlike traditional libraries, digital libraries provide users with the convenience of accessing content remotely, allowing for browsing, searching, and retrieval from any location and at any time. This transformation underscores the evolving nature of library services in the digital age, emphasizing increased accessibility and user flexibility.

Recent research highlights five key roles of digital libraries in academic institutions. First of all, digital libraries are enormous knowledge stores that facilitate research and educational endeavors by providing access to a variety of scholarly materials like e-books, journals, and databases (Rahman & Mohezar., 2020). Second, increased accessibility to digital libraries ensures that people may obtain material pertinent to their local communities' needs and gives them the tools and information they need to continue studying throughout their lives (Khan et al., 2022). Thirdly, by offering venues for networking, discussion, and resource exchange, digital libraries help academics and researchers collaborate and share information, promoting an environment of academic community and cooperation (Khan et al., 2022). Fourth, digital library offers to user the human knowledge in digital format by using variety linked devices such as smartphone, tablet and laptop without worries on the geographical barrier, language as well as different culture, all users could access it (AR Manabat, 2022). Lastly, by incorporating technologies like artificial intelligence to improve search capabilities, user experience, and information retrieval procedures for academic work, digital libraries support creativity and technical growth in academia. (Zaki et al., 2023).

Previous Studies on Malaysia Academic Library Digital Services

In recent years, the satisfaction of library users has garnered significant attention from researchers in Malaysia. University libraries, in particular, are striving to comprehend and address various factors influencing user satisfaction (Khan et al., 2018). Numerous studies have focused on evaluating and measuring user satisfaction related to library usage, especially within academic settings. Despite these efforts, there remains a notable gap in literature concerning user satisfaction specifically within the Malaysian context.

Suharto and Kadir (2021) identify several key factors that impact user satisfaction, including usefulness, functionality, reliability, and responsiveness. It is essential for academic libraries to ensure that their services, especially digital offerings, effectively support students in their learning, teaching, and research activities. This has been supported by Vicente (2018) who the academic libraries need to support student's learning teaching and research activities by providing IT technologies, learning resources and digital reference services. Digital library services encompass online materials and resources designed to enhance these processes. Trivedi et al. (2020) argues that the quality of digital library services in academic libraries is increasingly scrutinized, with a shift in perception viewing libraries primarily as physical spaces rather than as providers of quality online services.

A study conducted by Zaki et al. (2023) at the College of Computing, Informatics, and Media, university Teknologi MARA, Puncak Perdana Campus, revealed that certain aspects of digital library services perceived as relevant by users were found to be unsatisfactory. The research highlighted a decline in satisfaction related to system quality, while information quality and service quality did not significantly impact user satisfaction. Additionally, Chandra et al. (2018) note that library staff often do not engage in transforming libraries into service-oriented organizations focused on meeting user needs. They emphasize the importance of aligning library programs and services with user expectations to enhance support and problem-solving capabilities. This gap underscores the need for university libraries to improve their customer service orientation and better address user needs.

METHODOLOGY

This study has employed quantitative research approaches by adopting a survey technique in addressing the research questions and achieving the study's objectives. The method allows for systematic data collection and statistical analysis to generalize findings from a representative sample. The target population for this study includes over 4,000 higher education students at UiTM Puncak Perdana, Bukit Cherakah, Selangor, who are the primary users of the academic library services (Academic Affairs UiTM Puncak Perdana, 2023).

To ensure the results are statistically valid, a sample size of at least 384 students was selected, based on a 95% confidence level and a 5% margin of error (Zaki et al., 2023). This sample size is large enough to reflect the opinions of the entire student population. The sample consists of students from different levels of study—Diploma, Bachelor's, Master's, and Ph.D.—as well as various courses, to ensure a broad and diverse representation. A random sampling technique was used, giving every student in the population an equal chance to be selected. The responses were gathered through a questionnaire survey.

Respondents rated Likert scale items from 1 to 5, capturing their view and opinion towards the digital library services. This approach ensures a diverse and representative dataset, enhancing the reliability of findings and providing insights into the broader student experience with digital library services.

After data collection phases, the dataset was subjected to a comprehensive analysis process, including cleaning, transformation, and modeling, using the Statistical Package for the Social Sciences (SPSS), a widely recognized and robust tool for research analysis (Loga, 2013). Correlation analysis was employed to examine the strength and direction of relationships between the independent variables—Information Quality, System Quality, and Service Quality—and the dependent variable, User Satisfaction. Correlation analysis identifies the nature of these relationships: a positive correlation (+1) indicates that an increase in one variable corresponds to an increase in the other; a negative correlation (-1) suggests an inverse relationship; and zero correlation implies no association (Zaki et al., 2023). This study specifically investigated whether improvements in Information Quality, System Quality, or Service Quality are associated with increased User Satisfaction. Statistical significance was assessed using a p-value threshold of <0.05, meaning that relationships with a p-value below this threshold are considered statistically significant, allowing the null hypothesis to be rejected. This approach ensures rigorous and reliable interpretation of the relationships between the variables.

FINDINGS AND DISCUSSION

The study sought to explore the factors influencing user satisfaction with digital library services, focusing on three key hypotheses. The first hypothesis (H1) proposed that Information Quality (IQ) would have a significant impact on user satisfaction. This hypothesis was supported by data, revealing a statistically significant, albeit weak, positive correlation. The second hypothesis (H2) examined the influence of System Quality (SQ) on user satisfaction, and the findings indicated a significant positive effect, with a moderate correlation. The third hypothesis (H3) assessed the impact of Service Quality (SQ) on user satisfaction.

Findings

Table 1 shows results of Pearson Correlation coefficient values, which serve as indicators of the associations between variables, measure the strength and direction of the linear relationship between the variables. The figure below shows indicators for Pearson Correlation Analysis adopted from Sekaran (2013).

Coefficient Size	Strength of the Relationship
0.91-1.00	Very strong
0.71-0.90	Strong
0.41-0.70	Moderate
0.21-0.40	Weak
0-0.20	Very Weak

Fig. 1 Pearson Correlation Analysis (adopted from Sekaran and Bougie, 2013)

Based on Pearson Correlation Analysis table, the correlation between Information Quality and System Quality

is 0.237 indicates a relatively weak but positive association. Similarly, the correlation between Information Quality and Service Quality are 0.282 shows a weak yet positive relationship. The correlation between Information Quality and User Satisfaction 0.254 reveals a weak positive influence. Meanwhile, the correlation between Information Quality and Digital Library Usage are 0.117 is weaker but still positive.

Table I. Pearson Correlation

		IQ	SQ	SerQ	US	DLU
IQ	Pearson	1	.237**	.282**	.254**	.117**
	Correlation					
	Sig. (2-tailed)		.000	.000	.000	0.22
	N	384	384	384	384	384
SQ	Pearson	.237**	1	.234**	.314**	.283**
	Correlation					
	Sig. (2-tailed)	.000		.000	.000	.000
	N	384	384	384	384	384
SerQ	Pearson	.282**	.234**	1	.310**	.205**
	Correlation					
	Sig. (2-tailed)	.000	.00		.000	.000
	N	384	384	384	384	384
US	Pearson	.254**	.314	.310**	1	.289**
	Correlation					
	Sig. (2-tailed)	.000	.000	.000		.000
	N	384	384	384	384	384
DLU	Pearson	.117**	.283**	.205**	.289**	1
	Correlation					
	Sig. (2-tailed)	.022	.000	.000	.000	
	N	384	384	384	384	384

For System Quality, the analysis shows a modest positive correlation between System Quality and Service Quality are 0.234. The strong correlation between System Quality and User Satisfaction is 0.314, this strong relationship indicates that users highly value system reliability. The positive correlation between System Quality and Digital Library Usage is 0.283 suggests a notable correlation between these variables. The strong positive correlation between Service Quality and User Satisfaction are 0.310 shows that high-quality service delivery is closely associated to increased user satisfaction. the correlation between Service Quality and Digital Library Usage are 0.205 indicates that better service quality can lead to more frequent use of the library, suggesting that users are more likely to engage with the library when they perceive the service as high quality.

Lastly, the relationship between User Satisfaction and Digital Library Usage shows 0.289 which is modest yet positive. The analysis revealed that Information Quality, System Quality, and Service Quality are all positively correlated with User Satisfaction and Digital Library Usage. While the strength of these relationships, the most substantial correlations are observed between User Satisfaction and both System Quality and Service Quality.

Discussion: Overall User Satisfaction of Digital Library Services

To justify this research objective, this study examines the factors that influence overall user satisfaction with digital library services among students in higher education institutions located in Bukit Cherakah, Selangor. Among these factors, system quality emerged as the most influential factor, with a mean score of 3.81, closely followed by service quality, which had a mean score of 3.78 and is identified as a key predictor of user satisfaction. The finding that system quality plays a central role in shaping user satisfaction aligns with previous research by Masrek and Gaskin (2015), who also found system quality to be a significant determinant in their study.

Their study, conducted among students at university Teknologi MARA, revealed that higher system quality significantly enhances user satisfaction by providing smoother navigation and better access to resources. These aspects of system quality, including usability, availability, reliability, adaptability, and re-sponse time such as download time from Xu & Du (2021) while ease of access and privacy form Mahmood et al., (2023). These aspects contribute to a positive user experience and have been consistently recognized as strong predictors of user satisfaction in the context of information systems (Iqbal et al., 2022; Lwoga, 2013).

In line with the expectation, service quality is found to have a significant positive relationship with satisfaction and was identified as a key predictor of user satisfaction. This result is also in tandem with the findings obtained by Younus and Dilshad (2021), which indicated that responsive and effective service significantly enhances user satisfaction by providing timely assistance and resolving issues efficiently. This also aligns with findings from Masrek et al. (2010), which showed that the importance of service quality in academic library portals has a high effect on user satisfaction, significantly impacting the intention to reuse information systems through perceived value and user satisfaction (Zaki et al, 2023). The participatory nature of digital library further influences user engagement with the services. Librarians play a crucial role by delivering dependable services (reliability), prompt assistance (responsiveness), in-spiring trust and confidence (assurance), and offering personalized attention (empathy) (Iqbal et al, 2022).

CONCLUSIONS

This study investigated student satisfaction with the digital library services provided in an academic setting. Through an analysis of key variables significant relationship among information quality, system quality, service quality, user satisfaction, and digital library usages were identified. Notably, system quality and service quality were the most influential determinants of user satisfaction. Students expressed appreciation for the empathy, reliability, and warmth of library staff, as well as the system's enhanced navigation and improved access to digital resources. However, a notable percentage of dissatisfaction was also observed. While the findings indicate that students were not entirely dissatisfied with the digital library services, they highlighted specific areas in need of improvement, particularly in terms of information quality.

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