

Factors Affecting Library Engagement in the Digital Era

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Abstract

The third industrial revolution has shifted libraries from book-centered repositories into hybrid environments that integrate digital technologies, multimedia resources, and user-centered services. This study investigated library engagement in a local college in Cavite City, focusing on levels of engagement, influencing factors, and strategies for service enhancement. A descriptive-quantitative design with qualitative support was employed, sampling students and faculty through stratified sampling using Slovin's formula to determine size. Data were gathered through a validated online survey with Likert-scale and open-ended items, and analysed using descriptive statistics, Pearson correlation and thematic analysis. Results show moderate-to-high engagement, strongest in academically oriented activities such as studying, assignment completion, and course-related support. Engagement in orientations, library events, and

digital resource use was moderate. Correlation analysis revealed positive, significant relationships between engagement and all factors, where contextual factors were the strongest, followed by individual, organizational, and technological. Thematic responses highlighted needs for reliable internet, mobile and self-service access, updated collections, flexible hours, improved physical spaces, and digital literacy promotion. In other words, to sustain engagement it requires integrated approaches covering infrastructure, organizational practices, user capacity, and contextual support. Suggested strategies include upgrading digital infrastructure, diversifying collections, embedding library resources in curricula, redesigning spaces, and enhancing literacy and outreach programs.

Keywords: library engagement, digital library, Technology Acceptance Model, user-centered design, academic libraries

INTRODUCTION

The third industrial revolution had ushered tremendous changes in the technological landscape of society bringing about cataclysmic innovations like nano, bio, information technology, 3D printing, artificial intelligence and robotics which in turn increased the standard of living and life expectancy of



every nation. This upheaval produced quantum computing, smart dust, brain-computer interface and autonomous vehicle challenging the individual and organization alike to redefine and upgrade their systems, acquire new skills and foster new mind sets.

The library like any organization has to adapt to the rapid technological advancement brought about by this revolution, from the physical library to the digital library, modernizing the programs and services according to the demands of the era. Yoo-Lee and Kim (2014) has pointed out that libraries in the contemporary period are not just repositories or search tools for physical collection but evolve into housing content using the most advanced technologies like digital collection, utilization of social media to reach out to its users and provide multimedia resources. This shifts redefine their role and relevance to the present society but continue to serve as vital community hubs, offering not only information but also space for learning, collaboration, and cultural enrichment.

Despite this changes the level of engagement of users towards library services in the digital era differ from user to another, thereby stirring a debate. Such is the result of a study conducted by Caperida (2024) in a local community college, that although most of the students prefer digital resources than the physical collection of the library, there are still students that prefer the smell of the books and the presence of a human companion in learning. It indicates a challenge for the library to sustain offering both services to varied users. Hence, in order to better adapt and align services to the evolving needs of users, there is a need to understand their levels and factors of library engagement in the digital era. The insights produced from investigating how users patronize library services in the digital era can help inform the future direction of library planning, service design and policy-making.

Statement of the Problem

In the digital era, libraries are challenged to redefine their roles beyond traditional book lending to become dynamic learning environments that integrate technology, information access and user-centered services. Specifically, this study seeks to answer the following key questions:

1. What are the levels of library engagement?
2. What are the factors influencing engagement of users with library services?
3. How can library services be enhanced to better meet the needs of users in a digitally driven society?

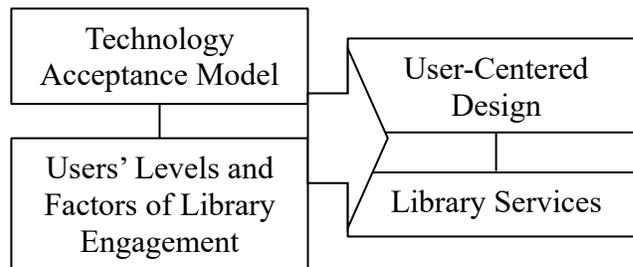
Conceptual Framework

This study is anchored on a theory popularized by Davies in 1989, the Technology Acceptance Model (TAM) and the concept promoted by Donald A. Norman in 1986 in his work user-centered service design.

TAM as cited in Worthington (2021) explains that users accept and utilize technology according to two primary factors, namely perceived usefulness and perceived ease of use. Perceived usefulness describes the degree to which a person believes that using a particular system would enhance their job performance. While, perceive ease of use defines the degree to which a person believes that using the system would be free from effort. In other word, it supports the idea that students and faculty patronize the usage of the library base on its usability and effectiveness influencing their engagement in the services offered.

In addition, the User-Centered Design (UCD) approach, originally proposed by Norman (1986) and later refined by Steen (2013), emphasizes designing services around the actual needs, behaviors, and

experiences of users. UCD advocates for involving users throughout the development process, ensuring that their feedback directly informs service improvements. This theory provides a basis that the evaluation and enhancement of library services is based upon the perception and interaction of users ensuring its relevance through a user expectation and insight.



Review of Related Literature

Compelled by the rapid evolution of technology, libraries around the world shifted from the traditional to digital libraries requiring its services to adapt to the changes of the user's behavior. Such as the point in the study of Rahamonava (2025) and Kaur (2015) highlighting the evolution of libraries into a dynamic knowledge center embracing the changing needs of users in the digital age ensuring its relevance and value to modern readers and researchers, while, Pachgade (2025) emphasized onsite-only services to diverse digital offerings such as e-books, digital archives, virtual references services, and automated retrieval systems. Accordingly, these services utilized advanced technologies like artificial intelligence, cloud computing, and data analytics assimilated to library operations improving its accessibility, personalization and integral efficiency. Engagement on the other hand, is heightened through the use of the social media platforms, virtual and augmented reality tools and creation of collaborations areas that is interactive inspiring an active involvement of the community.

Lately, user engagement in academic libraries has received notable recognition. Zhu, Whitaker, Cho and Zhang (2025) proposed conceptual framework illustrating engagement as an evolving process guided by various situations, strategies and activities. Accordingly, engagement is mostly formed by the approaches established by the librarian and the responses of the users to it. Rosman, Ismail, and Masrek (2019) amplified this idea by demonstrating that digital library engagement is a constant and significant relationship with the digital content that may depend on the motivation of the user and the system design of the platform, giving emphasis on the perception of the user about the library and its personnel. Thus making library engagement both a technological feature and the ability of the library to design activities that suits the needs of the users and their academic goals. And to better understand this engagement, they identified four factors that influence digital library engagement, namely, technological, organizational, individual and contextual.

In the Philippine context, Villanueva (2020) pointed out that the barriers in accessing digital library like limited internet bandwidth and lack of personal digital devices were usual experiences of public and rural institution that restricts ability of both students and teachers to periodically access and engage with digital library. Capule (2019) on the other hand, stressed the significance of human support and service visibility in increasing user satisfaction, revealing that students were likely to utilize library services when staff are approachable and proactive, especially if it is thoroughly promoted through instruction and on



digital platforms. Similarly, Guanzon (2022) found that student engagement increases when library resources are aligned with curriculum requirements and learning outcomes. In a nutshell, although there are barriers in accessing the services of the library in the digital era, users can still be engaged with the presence of a human companion to learning, an organized promotion of the services and its alignment to their academic needs.

Studies have extensively explored the shift from traditional to digital libraries, focusing on technological integration, digital resource management and user perceptions of online tools and platforms. Most of this research emphasize the adoption of digital technologies or the design of user-centered systems, but few have comprehensively examined how these technological, organizational, individual and contextual factors collectively influence library engagement, especially within the context of a digitally transforming academic environment. Moreover, there are limited empirical evidences on how users engage with modern services and variation of levels of engagement. This study addresses that gap by (1) assessing levels of engagement, (2) identify multifaceted factors influencing engagement of users, and (3) suggests actionable enhancements based on user feedback and contextual realities.

RESEARCH METHODOLOGY

This study employs a descriptive quantitative research design, complemented by qualitative components, to explore and analyze the perceptions and engagement patterns of library users, specifically students and faculty members, in relation to digital library services. The descriptive aspect determined the levels of library engagement, while the quantitative-correlational approach examined the relationships between influencing factors and user engagement. Whereas, the qualitative component provided deeper insights through open-ended responses that capture suggestions not addressed by survey items.

The study was conducted at San Sebastian College – Recoletos de Cavite, which integrates both traditional and digital library services. It is selected as it reflects the challenges and opportunities of academic libraries in the digital era, particularly in transitioning from book-centered to technology driven, user-centered services. The population of the study consists of students and faculty members of the said institution during the Second Semester of Academic Year 2024–2025 determined using Slovin's formula with a 5% margin of error and selected through a stratified sampling to ensure balanced representation between students and faculty members.

Data are gathered through a structured survey questionnaire comprising Likert-scale items and an open-ended question designed to capture more in-depth responses. The survey questionnaire, is divided into four parts namely, (1) role of the respondent whether they are a student or a faculty member; (2) levels of library engagement; (3) factors influencing engagement of users; and (4) service improvement suggestions. It also includes open-ended questions to capture qualitative insights such as common issues, challenges and recommendations. The instrument underwent expert validation from research experts and a pilot test to establish reliability using Cronbach alpha.

The survey was disseminated online through Google form and responses were collected in two weeks. Respondents were informed about the purpose of the study, their anonymity was assured, participation remain voluntary and an assertion that data collected on this study is solely to be used for academic purposes.

Descriptive statistics are used to analyze quantitative data, providing an overview of user perceptions and engagement behaviors. Meanwhile, qualitative responses are analyzed thematically to uncover common issues, suggestions, and insights that are not addressed in the closed-ended questions. To



measure the strength and direction of relationships between key factors and user engagement, Pearson correlation is applied.

RESULTS AND DISCUSSION

Levels of Library Engagement

The data collected from respondents were analysed using descriptive statistics to find the levels of library engagement using descriptive statistics. To interpret the mean scores of Likert scale responses, the following ranges were used: 4.00-5.00 as Very High, 3.00-3.99 as High, 2.00-2.99 as Moderate, and 1.00-1.99 as Low. This interpretation follows the conventional interval classification for 4 point Likert scales as described by Boone and Boone (2012).

Table 1 below shows the summary of the raw data collected from the respondents with corresponding mean score and interpretation.

Table 1. Summary of levels of library engagement.

Indicator	Mean	Interpretation
I use the library for studying	3.0625	High engagement
I use the library for reading books and journals	2.85	Moderate engagement
I use the library for doing my assignment	2.95	High engagement
I go to the library to borrow books for home use	2.575	Moderate engagement
I access the digital resources provided by our library (EBSCO and OER)	2.6	Moderate engagement
I attend library orientation	2.6	Moderate engagement
I attend library instruction (literacy programs)	2.5875	Moderate engagement
I participated on the activities spearheaded by the library like the celebration of the national book week	2.5625	Moderate engagement
I include materials from the physical library in my academic or professional work	2.775	Moderate engagement
I enjoy spending time in the library for study or reading	3.1625	High engagement
I feel motivated to use library resources for my coursework or research	3.05	High engagement
I feel that the library supports me in achieving my academic or professional goals	2.975	High engagement
I am encouraged by my instructors or colleagues to use the library's services	3.0	High engagement

The overall level of library engagement among respondents falls within the moderate to high engagement range, emphasizing a continued relevance of libraries even in the digital era. The highest level of engagement are observed in activities closely tied to academic needs, such as using the library for studying, completing assignments, and finding support for coursework and research. It expresses that, despite the abundance of digital alternatives, libraries remain central to academic life. This is consistent to the study of Deville and Sughrue (2023), who found that students exhibit strong engagement with physical library spaces and academic-use resources, specifically for independent study, group collaboration, and assignment completion.

However, moderate engagement in areas such as attending orientations, literacy programs, participating in library events, and accessing digital resources like EBSCO and the Online Educational Resources (OER) suggests that digital library services are underutilized, which is also evident in the research of Ayelaagbe and Omuotunde (2019) in Nigeria. Similarly, a local study found that students were only moderately knowledgeable and infrequent users of digital database. This result underlines a key challenge in the digital age that is while physical library spaces retain strong academic appeal, digital platforms and programs require better promotion, usability, and integration into user's learning habits. Strengthening engagement with digital services and library-led activities is essential to ensure libraries remain dynamic, responsive, and fully embedded in the digital learning ecosystem, upholding the fifth law of Ranganathan, the library is a growing organism.

Factors of library engagement

To show the factors influencing engagement of users with library services in the digital era, Pearson's correlation was used and the following table tally the result of the data analysis.

Table 2. Correlations of levels of engagement to factors of library engagement.

Variable		Overall Engagement	Overall Technological Factors	Overall Organizational	Overall Individual	Overall Contextual
Overall Engagement	Pearson's r	—				
	p-value	—				
	Spearman's rho	—				
	p-value	—				
Overall Technological Factors	Pearson's r	0.415	—			
	p-value	< .001	—			
	Spearman's rho	0.370	—			
	p-value	< .001	—			

Overall Organizational	Pearson's r	0.450	0.892	—		
	p-value	< .001	< .001	—		
	Spearman's rho	0.447	0.796	—		
	p-value	< .001	< .001	—		
Overall Individual	Pearson's r	0.484	0.799	0.834	—	
	p-value	< .001	< .001	< .001	—	
	Spearman's rho	0.442	0.771	0.844	—	
	p-value	< .001	< .001	< .001	—	
Overall Contextual	Pearson's r	0.516	0.870	0.937	0.912	—
	p-value	< .001	< .001	< .001	< .001	—
	Spearman's rho	0.500	0.744	0.931	0.851	—
	p-value	< .001	< .001	< .001	< .001	—
Overall Factors	Pearson's r	0.485	0.942	0.964	0.927	0.972
	p-value	< .001	< .001	< .001	< .001	< .001
	Spearman's rho	0.483	0.821	0.922	0.895	0.951
	p-value	< .001	< .001	< .001	< .001	< .001

Accordingly, all correlation coefficient between each factor and library engagement are positive and statistically significant as indicated by the p value 0.001, indicating that the identified factors are associated with levels of library engagement. The strongest correlation with library engagement with 0.516 is contextual factor suggesting that external influences like institutional support, peer culture, and library accessibility play the most significant role. Individual factors comes next with 0.484, saying that students' motivation and digital literacy showed a moderate to strong positive correlation. Third factor is organizational factor with 0.450, indicating that policies, the library staff and the offered services are influential to their patronage of the library. The lowest but with moderate positive correlation is technological factor with 0.415 indicating the importance of digital tools and internet access is shaping engagement.

These findings echo previous studies by various authors from the universities in Malaysia, Nigeria and China. In a Malaysian research university, Rahman, et al. (2023) discovered that digital library

engagement was considerably swayed by technological infrastructure, individual capabilities of users and contextual factors like institutional support and accessibility. While Nigerian undergraduates' utilization of the library is intensely related with organizational and contextual factors, specifically the adequacy of physical resources, user satisfaction and access to library services (Okie and Adetero, 2022). Furthermore, Chinese universities affirmed the significance of individual perception and technological quality, revealing that system usefulness, service reliability, and user fascination considerably produce user satisfaction and continuous utilization of digital libraries. This findings of Zhang et al. (2018) strengthen the idea that library engagement in the digital era is multifaceted. Even though technology remains significant, students' personal capacities, the library organizational structure, and wider contextual factors are impactful. Therefore, increasing engagement should focus on technological infrastructure, capacitating users, institutional support and service quality.

Service enhancement

The collected data from the respondents were coded and categorized respectively to the four factors of library engagement, namely technological, organizational, individual and contextual. The following table is an example.

Table 3. Themes and codes to enhance library services in the digital era.

Factors	Code
Technological	Improve WiFi connection, QR code to access digital books, Expand Technology Integration, computer terminals, introduce a digital self-checkout system or online book reservation for convenience, mobile accessibility, offering virtual help desks or live chat support for easier user assistance, upgrading on the online catalogue
Organization	More updated books, more subscriptions in journal articles, interactive activities, dedicated quiet and collaborative zones to improve user experience
Individual	overuse the sofas and chairs, more capacity because it is hard to study outside of the library, struggle with limited time to visit the physical library due to my classes
Contextual	Increase of soundproofed rooms and charging ports, space for private small group meetings, more couch, noise barriers

To enhance services for library engagement in the digital era, it is essential to address the interconnected concerns of technology, resource organization, individual student needs, and the physical environment. A study of Malaysian postgraduate libraries features these interconnected relationships that while most students are aware of digital library services and internet facilities, actual utilization was significantly lower, indicating that infrastructure alone is not enough to promote engagement (Alharthi, 2021). Technological advancement stands out as a crucial factor, as students demand faster and more reliable internet, updated computer units, and seamless access to digital resources through QR codes, virtual help desks, and self-service systems. These digital upgrades are not only expected but necessary for aligning the library with modern academic practices.

In terms of organizational development, updating the collection with more recent books, journals, and scholarly databases will ensure the relevance and usefulness of the library's content.



Integrating collaborative activities and clearly identified areas for quiet and learning commons can diversify the library. On the individual context, flexibility is needed to accommodate students' limited time such as that of the nursing department by offering more digital access points and extended availability of resources. Fair use of spaces and additional seating capacity can support effective and reasonable utilization of the facility. Finally, to boost contextual factors consider controlling noise, better lighting and more comfortable seats may imbibe a welcoming ambiance encouraging students to stay longer and utilized library services more regularly. The integral consideration of all these elements can lead to a library that is inclusive, technologically advanced, user-centered that meets the evolving needs of users in the digital age.

Conclusion

This study explored the levels, influencing factors, and service enhancement strategies for library engagement in the digital era. The findings revealed that overall engagement among respondents ranges from moderate to high, with the strongest involvement in academic-related activities such as studying, doing assignments and accessing course-related resources. These results emphasize the library's enduring relevance in supporting academic success, in the midst of the growing availability of digital alternatives. However, engagement was notably moderate in areas such as participation in orientations, literacy programs, library events and digital resource usage, and underutilization of available digital services like EBSCO and OER.

Further analysis showed multiple factors influence engagement with contextual factors, like accessibility and peer encouragement showing the strongest correlation, followed by individual (motivation, digital literacy), organizational (service policies, collection relevance), and technological factors (internet access, digital tools). These results stress a multidimensional nature of library engagement, aligning with international findings that interplay between infrastructure, user readiness and institutional contexts.

To foster deeper engagement, the study suggests a holistic enhancement of library services. Technological upgrades such as stronger internet connectivity, mobile access, and virtual assistance systems are crucial aligning with modern learning habits. At the organizational level, keeping collections updated and offering academic programs can strengthen the library's academic role. Flexibility in service availability and increased physical space capacity are also needed to accommodate students with limited time, particularly in demanding programs. In addition, improving the physical environment through soundproofing, comfortable seating, can make the library more inviting and conducive for learning.

Ultimately, these findings affirm that while libraries remain academically central, sustained engagement in the digital era requires not just maintaining infrastructure but also reimagining services to be more accessible, student-centered, and digitally integrated. In doing so, libraries can uphold Ranganathan's fifth law of library science which is a library is a growing organism through evolving with the changing needs of its users.

Recommendations

Based on the findings of the study, the following recommendations are proposed to strengthen library engagement in the digital era:

1. *Enhance technological infrastructure.* The library should prioritize upgrading its digital infrastructure to meet the evolving expectations of users which includes but not limited to improving internet speed



- and stability, providing updated computer units, and integrating user-friendly digital access points such as QR codes, mobile-optimized platforms, virtual help desks, and self-service kiosks.
2. *Update and diversify library resources.* To maintain the relevance and academic value of the library, continuous updating of print and digital collections is essential. Continue or expand subscription to more scholarly database and journal articles. Moreover, incorporate academic events such as research writing workshops, both talks, and themed exhibitions can diversify learning experiences and foster a stronger connection with library services.
 3. *Accommodate individual needs and study habits.* The library should implement more flexible services to support students with limited schedules, such as those in intensive programs like nursing and engineering. Extended library hours, increased digital access to resources, and online reservation systems for study spaces and materials would address these needs. It is also recommended to encourage more active collaboration with faculty to promote library use in coursework.
 4. *Improve the physical and social environment.* Restructuring of the physical environment such as installing noise barriers, enhancing lighting, increasing seating capacity, and creating distinct zones for quiet and collaborative work can make the library a more welcoming and productive space. Additional charging stations, soundproofed group study rooms and more comfortable seating can significantly increase the time students spend in the library and their overall satisfaction.
 5. *Promote digital literacy and service awareness.* Targeted and course integrated library instructions should be implemented to address the moderate use of digital services like EBSCO and OER. Librarians can collaborate with faculty to embed digital library components into syllabi, making digital resources use a regular part of academic tasks.
 6. *Adopt a holistic and student-centered library strategy.* Library planning should take a holistic approach by considering the four factors of library engagement, namely technological, organizational, individual and contextual as interconnected. The regular conduct of feedback mechanism from faculty and students, pilot testing of new services, and embracing innovation, libraries can remain dynamic, inclusive and aligned with the educational demands of the digital generation.

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