

# **Integrated Library Environment, User Engagement and Librarians User-Centered Approach: Predictors of the Library Service Quality**

Maria Mera P. Brazil <sup>1</sup>

1 – Lourdes College - Graduate Studies, Cagayan de Oro City, Philippines

Publication Date: May 28, 2026

DOI: **10.5281/zenodo.20428495**

## **Abstract**

This study examined the influence of the Integrated Library Environment (ILE), User Engagement (UE), and Librarians' User-Centered Approach (L-UCA) on Library Service Quality (IDSQ) in an academic library. A quantitative descriptive-correlational research design was employed, involving 200 library users as participants. Data were collected through a researcher-made questionnaire and analyzed using descriptive statistics, canonical correlation analysis, and multiple regression analysis. Results revealed that participants assessed the Integrated Library Environment as high in terms of library systems, technology integration, and space design. User engagement was also generally high, particularly in cognitive and affective dimensions, while behavioral engagement was moderate. Participants further rated the librarians' user-centered approach as high, indicating that librarians provide responsive, respectful, and personalized services that support users' academic needs. Likewise, the library's innovation-driven service quality was assessed as high, suggesting that the library effectively integrates technology, user feedback, and modern service features to enhance learning experiences. Statistical analysis showed that Integrated Library Environment, User Engagement, and Librarians' User-Centered Approach significantly influence Library Service Quality, with user engagement emerging as the strongest predictor. Overall, the findings indicate that a well-designed library environment, active user participation, and responsive librarian services collectively contribute to improving innovative and high-quality academic library services. For future research, it is recommended to explore specific variables that influence affective involvement, particularly the impact of social media engagement and mobile library applications on students' emotional connection to the library over time.

**Keywords:** *Integrated Library Environment, User Engagement, User-Centered Approach, Library Service Quality, Academic Libraries*



## INTRODUCTION

Academic libraries have been at the core of the teaching or learning and research processes in higher institutions of learning. Library services have gone through a massive transformation in the last few years, as opposed to a few years back, when only print resources were available. Digitally, students and faculty members can now locate the books they want to use from different libraries through online catalogs, access various journals through subscription-based databases, and communicate globally via social media and other platforms for different purposes. These offset know-hows equip libraries with new powers to give services more rapidly and efficiently as the information age goes. According to Baffour Gyau, Liu, and Akowuah (2021), these developments signify the global endeavors of becoming more library-services-friendly in terms of access, convenience, and effectiveness to academic users.

The degree of user satisfaction with the library is a decisive factor in measuring the success towards Library Service Quality. LSQ shows the library's proactive initiatives to exceed user expectations through innovation quality of available sources and services and user-focused processes a sure way to get them a higher performance and to the general academic and research outcome (Sharma, 2024). Though much advancement has been made, limited research regarding the effects of the integrated library environment, user engagement on driving library service quality in the Philippine context, particularly in Cagayan de Oro, has been noted. How integrated library environment, user engagement has influenced on library service quality is something that has been hinted at but not really thoroughly researched. To understand these dynamics, the study has chosen to focus on one of the largest academic libraries in the region. This question is not just significant for the realization of the goals of the institution but also for the global development priorities. Academic libraries, in particular, are instrumental to the realization of the United Nations Sustainable Development Goals (SDGs), such as SDG 4, which calls for providing quality education that is inclusive and equitable, as well as lifelong learning opportunities (United Nations, 2015). Besides this, by elevating technology, innovation, and infrastructure through the modernization of services, the libraries become the agents of change for SDG 9, and, simultaneously, they improve user satisfaction and engagement. Thus, by equipping learners with the necessary skills for achieving SDG 8, they become the instruments for creating sustainable economic growth (United Nations, 2020). As a result, the present work both feeds into the existing base of knowledge and reveals the crucial role that libraries can play in achieving sustainability.

The research at hand is a study in one of the academic libraries in Cagayan de Oro that looks at the combined effect of the Integrated Library Environment, User Engagement, and the Librarians User-Centered Approach on Library Service Quality. Its main objective is to create a reservoir of ideas for library administrators and policymakers. The findings may be used to streamline the approaches to service delivery and to stimulate the flow of communication between providers and users, thereby having a ripple effect on the academic experience. Besides that, this investigation adds to the scant research in the field of library modernization in Philippine higher education, indicating that there is a need to localize the alignment with the international standards and sustainable development goals (Meena, 2024).



## Research Questions

1. What is the participants' assessment of the integrated library environment in terms of:
  - 1.1 Library Systems
  - 1.2 Technology Integration: and
  - 1.3 Space Design?
2. What is the participant's level of engagement in terms of:
  - 2.1 Cognitive;
  - 2.2 Affective; and
  - 2.3 Behavioral?
3. What is the participants' assessment of the librarians' user-centered approach?
4. What is the participants' assessment of the library service quality?
5. Do integrated library environment, user satisfaction and librarians' user centered approach has significantly influence the library service quality?

## Methodology

The study employed a descriptive-quantitative research approach whereby the researcher collected systematically the rich information about integrated library environment and their association with user satisfaction, usage, and engagement. A Descriptive quantitative researches concentrate on gathering numerical information using structured tools (such as surveys or questionnaires) and allowing objective measurement and statistical analysis of variables in order to describe phenomena or determine relationships between them (Babbie, 2010; Muijs, 2010). This research design is suitable to give a clear and accurate picture of the role of modernization efforts on perceptions and behavior of the users in the academic library setting.

The participants were active student users of an academic library located in Cagayan de Oro City academic year 2025-2026. The target population consisted of undergraduate college students who frequently utilize the institution's library services, whether in physical or electronic formats, totaling a required sample size of 200 respondents. Inclusion criteria required official undergraduate affiliation with the institution and active utilization of library services within the academic year. Exclusion criteria covered unaffiliated individuals, casual visitors, high school students, graduate students, faculty members, and any students who had not utilized the library within the specified timeframe.

To select the required 200 participants from the identified user population, the researcher utilized a Systematic Random Sampling technique, a method chosen for its efficiency in achieving an equal representative sample using Taro Yamane's formula for a finite population of about 15,000 with a 5% margin of error, the recommended sample size was approximately 390. The study initially targeted 200 participants, and 200 questionnaires were distributed.

The collected through adapted and modified questionnaire the instrument adequately measures the major variables of the study, namely: Integrated Library Environment, User Engagement, Librarians User-Centered Approach and Library Service Quality. Items on library research supported from SERVQUAL (Parasuraman, Zeithaml, & Berry, 1988), LibQUAL+49



(Association of Research Libraries, 2002), the Kano model (Kano et al., 1984), DeLone and McLean's Information Systems Success Model (2003) and the Student Engagement Scales (Fredricks, Blumenfeld, & Paris, 2004). The questionnaire had four parts: Part I measured to integrated library environment, Part II devoted to user engagement, Part III measured to e Librarians User-Centered Approach, Part IV intended to Library Service Quality

Before full data collection, the instrument underwent content validation and reliability testing. A panel of experts in library and information science, educational technology, and generative AI reviewed the questionnaire, and the researcher integrated their comments into the revised version. The researcher then conducted a pilot test with 30 undergraduate students who were not included in the main study, and computed Cronbach's alpha indicated one initial item under research support was removed to improve internal consistency. All coefficients met or exceeded the 0.7 threshold, indicating acceptable reliability for the constructs.

Prior to data collection, the researcher obtained ethics clearance from the Graduate School Research Ethics Committee and secured written permission from the university administrator. The questionnaire was administered during non-instructional time in to avoid inconvenience. The researcher upheld respect for persons by providing an information sheet and informed consent form explaining the purpose of the study, procedures, estimated completion time (7–10 minutes), and voluntary participation in both English and Filipino. Participants were informed that they could refuse participation, skip items, or withdraw at any time without penalty and without any effect on grades or standing. The researcher declared no conflict of interest and held no supervisory or grading authority over participants. To protect confidentiality, the questionnaire did not collect names, ID numbers, or other direct identifiers. Completed questionnaires were placed in sealed envelopes and collected immediately

The study observed beneficence by minimizing risk and protecting privacy. Participation was not tied to grades, incentives, or employment, ensuring a voluntary participation. The researcher used the data only for academic purposes related to understanding participant assessment in integrated library environment, user engagement, librarian's user-centered approach and library service quality. The researcher stored completed questionnaires in a locked cabinet and stored encoded files in password-protected digital storage accessible only to the researcher. The study followed Republic Act 10173 (Data Privacy Act of 2012) by collecting only necessary data, securing storage, and planning for secure destruction after the retention period. The study upheld justice by applying inclusion criteria aligned with the study purpose and giving all eligible students equal opportunity to participate within cooperating classes, without favoring any subgroup. All ethical compliance measures were maintained to ensure the integrity of the research process.

For data interpretation, the study used the prescribed scoring procedure with five descriptive ranges: 4.51–5.00 (Very High), 3.51–4.50 (High), 2.51–3.50 (Moderate), 1.51–2.50 (Low), and 1.00–1.50 (Very Low). The researcher used regression analysis (mean and standard deviation and pearson r) for Problems 1 and 2 utilized mean and standard deviation that describe participants' assessments of integrated library environment and their level of engagement. For Problems 3-4 to identify relationships that exist between integrated library services, user



engagement, librarian's user-centered approach and library service quality at .05 level of significance.

## Results and Discussion

### Research Question 1. What is the participants' assessment of the integrated library? environment in terms of:

- 1 .1 Library Systems
- 1 .2 Technology Integration: and
- 1 .3 Space Design?

Table 1 presents the summarized results of participants' assessment of the Integrated Library Environment (ILE) across its three major dimensions: Library Systems, Technology Integration, and Space Design. The results indicate that all three dimensions were rated highly by users, with mean scores of 4.10 for Library Systems, 3.73 for Technology Integration, and 4.34 for Space Design, resulting in an overall mean of 4.06. These findings suggest that users perceive the ILE as effective in supporting academic activities, providing a user-friendly technological environment, and maintaining a conducive physical space.

**Table 1**

*Summary Table of the Participants' Assessment of the Integrated Library Environment*

Integrated Library Environment	Mean	SD	Interpretation
Library Systems	4.10	0.65	High
Technology Integration	3.73	0.74	High
Space Design	4.34	0.69	High
Overall	4.06	0.59	High

### Research Question 2. What is the participant's level of engagement in terms of?

- 2.1 Cognitive;
- 2.2 Affective;
- 2.3 Behavioral?

Table 2 provides an overview of participants' engagement in the Integrated Library Environment (ILE) across cognitive, affective, and behavioral dimensions. The data indicates that cognitive engagement ( $M = 3.84$ ,  $SD = 0.80$ ) and affective engagement ( $M = 4.08$ ,  $SD = 0.72$ ) are high, while behavioral engagement ( $M = 3.50$ ,  $SD = 0.87$ ) is moderate. Overall, participants' engagement is interpreted as high ( $M = 3.80$ ,  $SD = 0.70$ ), reflecting active intellectual and emotional involvement with library resources, though not all of this engagement is fully expressed in observable behaviors.

**Table 2**

*Summary Table of the Participants' Level of Engagement*

Level of Engagement	Mean	SD	Interpretation
Cognitive	3.84	0.80	High
Affective	4.08	0.72	High
Behavioral	3.50	0.87	Moderate
Overall	3.80	0.70	High

### Research Question 3. What is the participants' assessment of the librarians' user-centered approach?

Table 3 presents participants' assessment of the librarians' user-centered approach in the academic library. The data show that most participants rated the approach as high ( $M = 4.20$ ,  $SD = 0.69$ ), with 37.5% indicating very high and 48.5% indicating high levels of satisfaction. This demonstrates that librarians are perceived as attentive, responsive, and proactive in meeting user needs, which supports both effective service delivery and user satisfaction.

**Table 3**

*Participants' Assessment of the Librarians' User-Centered Approach*

Score Range	Interpretation	Frequency	Percentage
4.51 – 5.00	Very High	75	37.5
3.51 – 4.50	High	97	48.5
2.51 – 3.50	Moderate	23	11.5
1.51 – 2.50	Low	5	2.5
1.00 – 1.50	Very Low	0	0
Total		200	100
Mean		4.20	
SD		0.69	
Interpretation		High	

### Research Question 4. What is the participants' assessment of the library service quality?

Table 4 presents participants' assessment of the library Service Quality. The results indicate that participants rated the library's Library Service Quality as high ( $M = 4.13$ ,  $SD = 0.77$ ), with 35% reporting very high and 44% reporting high levels of satisfaction. These findings suggest that the library is perceived as delivering services that not only meet user expectations but also incorporate innovative features and continuous improvements that enhance the academic experience.

**Table 4***Participants' Assessment of the Library Service Quality*

Score Range	Interpretation	Frequency	Percentage
4.51 – 5.00	Very High	70	35
3.51 – 4.50	High	88	44
2.51 – 3.50	Moderate	34	17
1.51 – 2.50	Low	6	3
1.00 – 1.50	Very Low	2	1
Total		200	100
Mean		4.13	
SD		0.77	
Interpretation		High	

**Research Question 5. Do integrated library environment, user engagement and librarians' user centered approach have significantly influence the library service quality?**

Table 5 presents the canonical correlation analysis between Integrated Library Environment (ILE) and Library Service Quality. The results reveal a strong, significant positive correlation between these variables,  $F(3, 196) = 74.506$ ,  $p < .001$ , with  $R_c = 0.73$  and  $R_c^2 = 0.53$ . This indicates that 53% of the variability in library service quality is explained by the Integrated Library Environment, demonstrating that well-structured library systems, technology integration, and thoughtfully designed spaces collectively contribute to higher levels of innovation-driven service quality.

**Table 5***Regression Analysis of Integrated Library Environment, Librarian's User Centered Approach, and User Engagement on Library Service Quality*

Predictor	Unstandardized Coefficients		$\beta$	95% CI		t	p
	B	SE		Lower	Upper		
Constant	0.11	0.24		-0.37	0.58	0.441	0.660
Integrated Library Environment	0.36	0.10	0.275	0.16	0.55	3.625	<.001
Librarian's User-Centered Approach	0.24	0.08	0.211	0.08	0.40	2.897	0.004
User Engagement	0.42	0.07	0.381	0.27	0.56	5.634	<.001

## Model Summary

 $R = 0.786$      $R^2 = 0.618$     Adjusted  $R^2 = 0.612$      $F(3,196) = 106^*$      $p < .001$



The overall model was statistically significant,  $F(3, 196) = 106, p < .001$ , with  $R = 0.786$  and  $R^2 = 0.618$ , indicating that 61.8% of the variability in library service quality is explained by these three predictors.

Individually, all three predictors significantly contribute to library service quality. User Engagement ( $\beta = 0.381, t = 5.634, p < .001$ ) emerged as the strongest predictor, highlighting the critical role of users' cognitive, affective, and behavioral involvement in enhancing innovative library services. Since all predictors are significant at the .05 level of significance as null hypothesis is rejected showing that A well- structured environment and responsive staff act as strategic resources, but the active engagement of users amplifies their impact on library service delivery.

### **Conclusions and Recommendations**

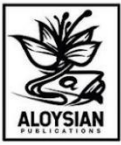
The study aimed to determine how integrated library environment, user engagement, librarian's user-centered approach use predict library service quality among undergraduate students at a university in Cagayan de Oro City. The findings show that user engagement is the strongest predictor among the independent variables when library spaces are equipped with modern technological resources designed for comfort and focused learning, and when personnel offer guidance tailored to individual needs, users develop a stronger sense of belonging.

Ultimately, the results affirm that library service quality emerges when libraries commit equal attention to upgrading technology and attending to the personal experiences of their users. Such institutions transition from simple study venues into intellectual and creative hubs that contribute to the broader academic mission. By maintaining this balance, the library is positioned to not only meet but genuinely surpass student expectations, fostering a willingness among users to engage with emerging programs and initiatives.

To sustain this growth, library administration and staff should prioritize the continuous modernization of physical and digital infrastructures, such as "innovation labs," while adopting personalized service approaches that enhance emotional and intellectual connections with users. Faculty members are encouraged to integrate these resources directly into classroom activities, bridging the gap between theory and practical research. Simultaneously, students should take an active role in feedback sessions, as their deep engagement is a key driver in shaping the future of library services and improving their own learning outcomes. Future researchers are encouraged to explore specific variables that influence "affective involvement," such as the impact of social media engagement or mobile library apps on a student's emotional connection to the library. Additionally, longitudinal studies should be conducted to determine how long-term exposure to an innovation-driven library environment affects overall academic performance and retention rates.

### **Compliance with Ethical Standards**

To respect participant autonomy, undergraduate students were fully informed about the study before answering the questionnaire through an information sheet and consent form that



explained the purpose of the research and procedures. Students were told that they could decline to participate, skip any question they did not wish to answer, or stop at any point. Names, ID numbers, and other direct identifiers were not written on the forms, and completed questionnaires were placed in sealed envelopes so that individual responses remained confidential.

Participation in the study was entirely voluntary, and the researcher had no grading or supervisory authority. Students were assured that their decision to join or withdraw would not affect their grades, standing in class, or relationship with the institution. This emphasis on free choice and privacy helped them maintain control over their contributions and supported a climate of comfort and trust in the research process.

Beneficence and justice were observed by keeping participation low risk, limiting the data collected to what was needed for the study, and inviting all eligible students. Completed questionnaires were stored in a locked cabinet and encoded in password-protected files, in line with Republic Act 10173 (Data Privacy Act of 2012). Data were used solely for academic purposes related to understanding students' utilization of generative AI and will be destroyed after a limited retention period.

### **Acknowledgements**

The researcher would like to express deepest gratitude to all who contributed for the success of this study. Particularly to the thesis mentor, panel members whose constructive comments and expert insights made drastic refinement throughout the conduct of the research. The researcher thanks as well the participants for their time and cooperation that made the data collection possible.

Formally acknowledging also to the developers and authors of the related references used in this study that served as the backbone that support in measuring the variables being used. Appreciation likewise given to the university administrators, faculty and staff for granted and made aligned with the goals of the research process.

Above all, the researcher is deeply thankful to the Almighty Father as He transcended abundant blessings, family for the unmeasurable support, Alex and friends for their encouragement and understanding throughout the success of this study.



## References

Baffour Gyau, K., Liu, Y., & Akowuah, F. (2021). Global trends in library modernization: Accessibility, convenience, and effectiveness. *Library Philosophy and Practice*, 2021(1), 1–14. <https://digitalcommons.unl.edu/libphilprac>

Babbie, E. (2010). *The practice of social research* (12th ed.). Wadsworth Cengage Learning.

Meena, R. (2024). Aligning local academic library practices with international standards. *International Journal of Library and Information Sciences*, 16(2), 27–35.

DeLone, W. H., & McLean, E. R. (1992). Information systems success: The quest for the dependent variable. *Information Systems Research*, 3(1), 60–95.  
<https://doi.org/10.1287/isre.3.1.60>

Davis, F. D. (1989). Perceived usefulness, perceived ease of use, and user acceptance of information technology. *MIS Quarterly*, 13(3), 319–340. <https://doi.org/10.2307/249008>