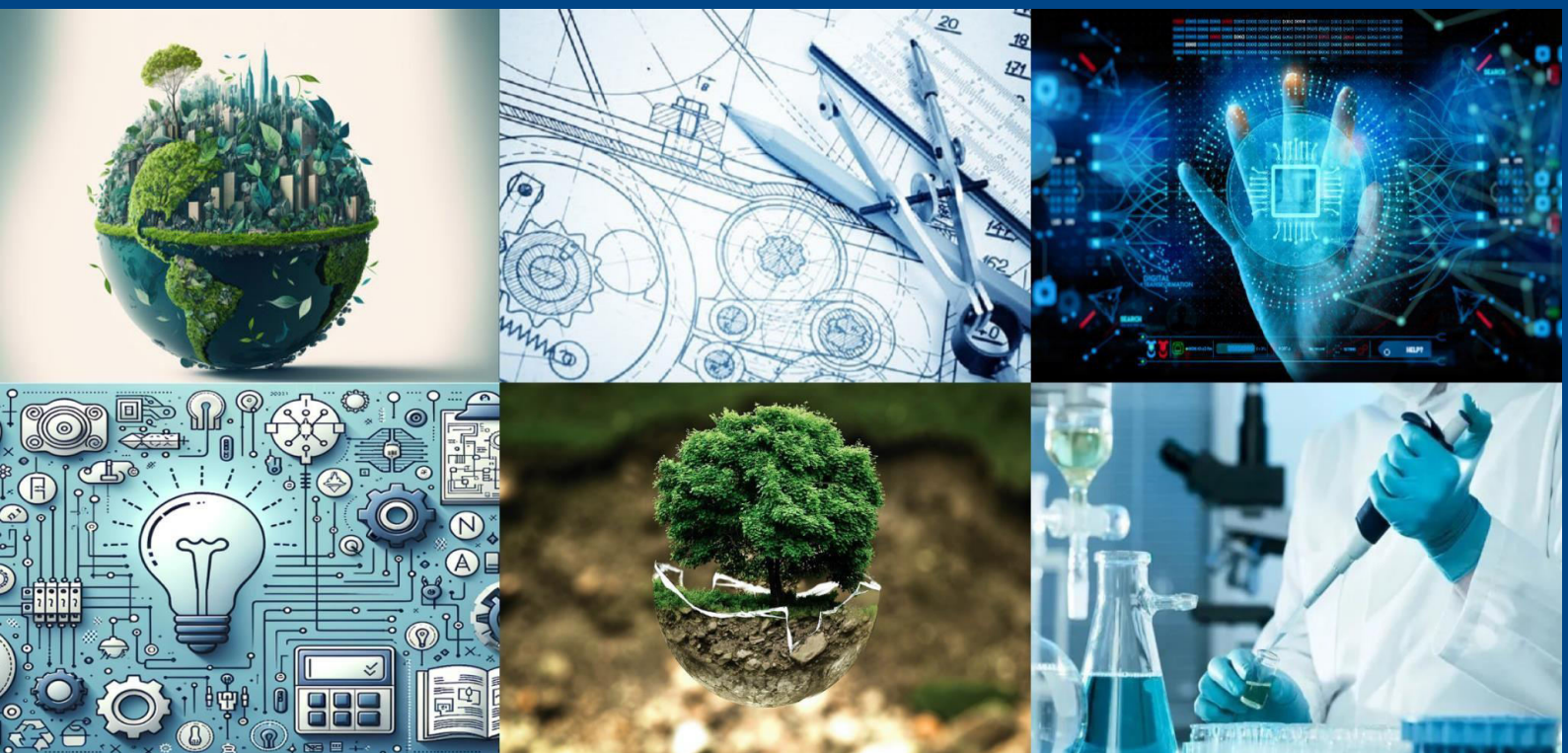




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Patterns of Library Utilization in Tertiary Education: Insights from a Philippine University

Vanessa Gay R. Liabor

College of Arts and Sciences, Negros Oriental State University, Philippines

ORCID: 0009-0000-8466-5744

ABSTRACT: This study investigates the utilization patterns of library services at Negros Oriental State University across three academic years (AY 2021–2024), focusing on how library usage correlates with academic performance, user satisfaction, and perceived usefulness. Using quantitative data from attendance logs, OPAC usage, and digital access platforms, the study analyzed the behavior of approximately 11,000 student visits during peak academic periods, particularly in November. Results showed that undergraduate students constituted the largest user group, with peak physical usage from 10:00 AM to 2:00 PM and heightened digital access between 7:00 PM and 11:00 PM. Digital resources—including e-books and online databases—were accessed significantly more than printed materials, demonstrating a lasting shift toward hybrid engagement. A Pearson correlation analysis confirmed a moderate positive relationship ($r = 0.51$, $p < 0.01$) between the frequency of library visits and GPA. Survey responses from 150 students further revealed that 92% found the library instrumental in exam preparation, citing access to board exam materials, thesis manuscripts, and reliable internet connectivity. The findings align with CHED CMO No. 24, s. 2015, emphasizing the strategic role of academic libraries in teaching and research ecosystems. The study concludes with recommendations for improving digital infrastructure, promoting underutilized services, and strengthening faculty-library collaboration to support blended learning and enhance academic success.

KEYWORDS: academic libraries, digital library usage, blended learning, higher education, Philippines

I. INTRODUCTION

Academic libraries remain central to the knowledge ecosystem of higher education institutions (HEIs), serving as critical hubs for learning, research, and access to information. In the Philippine context, their role is formally reinforced by CHED Memorandum Order No. 24, s. 2015, which outlines policies and standards for academic libraries in colleges and universities. This policy mandates the provision of adequate, functional, and responsive library services to support curriculum delivery and institutional development, emphasizing equitable access, information literacy, and user-focused service (Commission on Higher Education [CHED], 2015).

With the rapid evolution of educational delivery models—particularly the shift toward digital platforms and hybrid learning environments—libraries are now challenged to transform traditional services into technology-enabled systems. Cadiz et al. (2024) emphasized that Philippine HEIs are transitioning toward Education 4.0, prompting the modernization of access systems and the cultivation of digital readiness among users. Sy et al. (2024) underscored the relevance of data analytics and user behavior modeling in shaping effective library development strategies for data-driven campuses.

In support of these institutional shifts, theoretical frameworks such as Wilson's (1999) model of information behavior provide valuable insight into how users seek and use information, highlighting the influence of context, barriers, and access mechanisms. Complementing this, Tenopir (2003) offered a systematic review of electronic library usage trends, revealing that patterns of e-resource access are often shaped by user needs, institutional support, and digital infrastructure. These frameworks offer a useful lens for interpreting usage data within Southeast Asian academic contexts.

Empirical studies also affirm the positive relationship between library service utilization and academic performance. Lasig and Collantes (2022) found that students who effectively use library services exhibit improved academic outcomes, especially when those services are perceived as helpful and learner-centered. Majid and Foo (2001) conducted a comparative study across academic libraries in the ASEAN region and reported significant variations in e-



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resource usage depending on awareness, usability, and institutional promotion—insights highly relevant to Philippine HEIs. Mariano (2024) added that virtual reference services (VRS) enhanced user engagement and access during remote learning, demonstrating the importance of timely and adaptive academic support.

Moreover, the Philippine academic library continues to fulfill social and civic roles beyond its instructional functions. Yap and Labangon (2015) called for integrating corporate social responsibility (CSR) within libraries—such as the Human Library project—to cultivate empathy, inclusivity, and cultural awareness. In parallel, Islam et al. (2019) and Corpuz (2020) emphasized that the effectiveness of academic libraries hinges on their capacity to deliver relevant collections and digital competencies in line with institutional goals and emerging user demands.

Despite such advancements, several studies note disparities in library usage. Colbongan-Papay and Colas (2023) and Bautista et al. (2023) observed low to moderate engagement with academic e-resources, often due to limited awareness or insufficient user training. Magno and Hernandez (2021) pointed to digital literacy as a key factor in maximizing library utility, while Mariano and Aytona (2023) advocated for tighter integration of library portals with institutional LMS platforms to facilitate access and improve user experience.

Guided by these empirical findings and aligned with national directives such as CHED CMO No. 24, s. 2015, this study investigates actual usage patterns of academic library services at a Philippine university. It explores the frequency and nature of user engagement, compares digital and physical resource preferences, and identifies service gaps. Ultimately, the study aims to provide evidence-based insights that inform strategic planning and responsive library management within the context of blended learning and digital transformation.

II. REVIEW OF RELATED LITERATURE

The utilization of academic library services plays a critical role in supporting student learning, faculty research, and the overall academic mission of higher education institutions (HEIs). In the Philippine setting, this importance is formalized through CHED Memorandum Order (CMO) No. 24, s. 2015, which mandates the provision of both traditional and digital library services that are responsive to curricular needs and institutional outcomes (CHED, 2015). The directive emphasizes user-centered service, updated collections, and professionalized staffing—core themes echoed across regional and global literature.

Digital Transformation and Access Behavior

The rise of digital platforms has significantly changed how academic communities interact with library resources. Studies from the Philippines and Southeast Asia illustrate this shift, emphasizing the growing role of Virtual Reference Services (VRS), Learning Management System (LMS) integration, and e-resource portals. Mariano (2024) and Mariano & Aytona (2023) underscore how digital interfaces have become indispensable, particularly during the pandemic. Their findings align with Wilson's Information Behavior Model, which explains how users seek information depending on situational contexts (e.g., exam preparation, thesis writing) and environmental enablers like virtual platforms.

Despite these advancements, Colbongan-Papay & Colas (2023) and Bautista et al. (2023) report persistent underutilization of digital services, which is frequently attributed to low digital literacy and insufficient promotion. This reflects the “barriers component” in Wilson's model—wherein access does not automatically lead to usage if users lack skills, confidence, or awareness. Magno & Hernandez (2021) emphasize that digital fluency is key to maximizing the value of e-resources, suggesting that academic libraries must go beyond provisioning and focus on capacity building.

Library Use and Academic Outcomes

A key focus of library studies has been the relationship between library usage and student achievement. In Philippine HEIs, Lasig & Collantes (2022) demonstrated that students who engage regularly with library resources—both physical and digital—tend to have higher academic performance. Similarly, Cadiz et al. (2024), in their bibliometric analysis, linked library modernization and e-resource access with improved academic productivity, particularly in institutions moving toward Education 4.0.

These findings also connect with the Technology Acceptance Model (TAM), which posits that perceived usefulness and ease of use influence an individual's likelihood to adopt technology. In the context of libraries, when services are



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intuitive and beneficial (e.g., access to reviewers, journals, Wi-Fi for LMS), students are more likely to integrate them into their study habits, which in turn supports academic success.

Service Innovation and the Social Role of Libraries

Academic libraries in Southeast Asia are also reimagining their civic and social functions. Yap & Labangon (2015) advocate for CSR integration, using the "Human Library" as an example of how libraries can cultivate empathy, diversity, and inclusion. This aligns with international trends that broaden the library's role beyond a purely academic facility to a community-centered learning space.

Corpuz (2020) expands this notion by calling for continuous performance assessments of academic libraries to ensure service relevance and alignment with institutional goals. Such ongoing evaluations support the adaptive capacity of libraries to meet the demands of 21st-century learners.

ICT, Learning Analytics, and Future-Proofing Library Services

The sustainability of modern academic libraries depends heavily on ICT infrastructure and data-informed service design. Islam et al. (2019) provide a Southeast Asian perspective, outlining systemic barriers to ICT integration—such as funding limitations, staff resistance, and inconsistent internet connectivity—that also apply to many Philippine HEIs.

Meanwhile, Sy et al. (2024) call for the use of AI-powered learning analytics to monitor student engagement and optimize service interventions, including library programming. These technologies allow libraries to become more responsive to real-time user behaviors and academic patterns, contributing to data-driven campus ecosystems.

Synthesis and Gaps

Collectively, these studies underscore the multifaceted role of academic libraries as educational, technological, and social support systems. However, gaps remain in synthesizing usage data with student outcomes and integrating behavioral models in library planning. While policy frameworks like CMO No. 24, s. 2015 provides strategic direction, and operationalization often depends on contextual analysis at the institutional level. This study addresses that gap by examining library usage patterns within a Philippine university through the lens of both information behavior and technology acceptance, offering evidence-based insights for future policy and service refinement.

III. OBJECTIVES OF THE STUDY

The primary objective of this study is to analyze the patterns of library utilization among students and faculty in a Philippine higher education institution to inform strategic improvements in library services.

Specifically, the study aims to:

1. Determine the frequency and nature of library usage across various user groups (e.g., undergraduate students, graduate students, faculty members).
2. Analyze temporal trends and usage behaviors, such as peak access periods and usage during academic milestones (e.g., midterms, finals, project deadlines).
3. Identify the most accessed library resources and services, including both physical (e.g., circulation materials, study spaces) and digital (e.g., online databases, virtual reference platforms) components.
4. Assess gaps, limitations, and challenges encountered in current library service delivery from the perspective of actual usage data.
5. Examine correlations between library utilization and academic performance, user satisfaction, and perceived usefulness.
6. Propose data-informed recommendations for enhancing user engagement, resource access, and library system responsiveness in support of teaching, learning, and research.



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IV. METHODOLOGY

Research Design

This study utilized a descriptive quantitative research design to analyze library usage patterns among students and faculty at Negros Oriental State University. This design was appropriate for collecting and interpreting numerical data related to library attendance, resource access, and usage frequency, to identify trends and draw statistical inferences.

Study Site

The research was conducted at Negros Oriental State University (NORSU), a multi-campus public higher education institution offering undergraduate and graduate programs. The university's central academic library and satellite libraries provide services to a diverse student and faculty population across disciplines, making it a representative site for analyzing academic library usage in a state university setting.

Data Sources

Quantitative data were collected from the university's library management systems and digital service platforms. The following sources were utilized:

1. Log-in records from manual and RFID attendance systems,
2. OPAC and circulation logs for print materials usage,
3. E-resource access records from databases, institutional repositories, and online journal platforms,
4. Library access time logs and digital terminal usage statistics.

These datasets were drawn from authenticated library systems, ensuring accuracy and completeness of usage patterns for both physical and digital services.

Sampling and Data Collection Period

The data covered three years (AY 2021–2024) to reflect patterns during online, blended, and in-person instructional modalities. Census sampling was employed for system-based data, meaning all registered users with activity records during the period were included. This approach allowed for a full-scale analysis of usage without the need for estimation or projection.

To analyze specific trends, a focused subset from November 2023 was extracted—coinciding with the pre-final examination period—to examine correlations between usage and academic performance. From this subset, a stratified random sample of 200 student records was selected and matched with GPA data for correlation analysis. Stratification ensured proportional representation from key academic departments.

The rationale for this sampling procedure was to obtain a robust, unbiased dataset reflecting actual library use and to ensure that analysis could generalize to the broader student body.

Data Analysis Tools

Data were cleaned and processed using Microsoft Excel to prepare frequency distributions and identify outliers. Further statistical analyses were performed using SPSS to calculate descriptive statistics, usage distributions, and correlations. Specifically, Pearson's r was used to assess the relationship between the number of library visits and academic performance.

To support data visualization and interpretation, Power BI was used to generate dashboards showing monthly usage trends, peak access hours, and comparative use of digital versus physical resources. These tools enhanced the clarity of results and facilitated data-driven insights for institutional planning.

V. RESULTS AND DISCUSSION

Demographic Distribution of Users

Analysis of the user records revealed that a significant majority of library users were students, accounting for approximately 87% of total log-ins, while faculty members comprised 9%, and the remaining 4% included administrative staff and external researchers. Among student users, undergraduate students were the most frequent patrons, particularly those enrolled in education, engineering, and business programs.



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A departmental breakdown indicated that the College of Education had the highest number of library users, followed by the College of Engineering and the College of Arts and Sciences. This trend may reflect the nature of coursework in these departments, which heavily depends on both printed and digital references for assignments, theses, and licensure exam preparation.

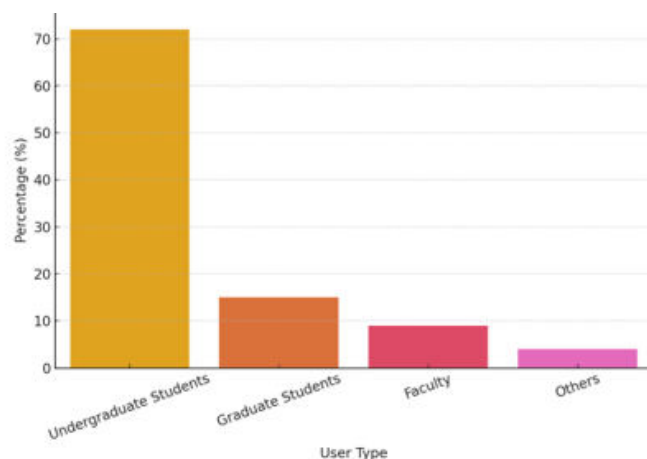


Figure1. Library User Demographic

Frequency and Time-Based Patterns

Usage data revealed that peak library hours occurred between 10:00 AM and 2:00 PM, coinciding with break periods between morning and afternoon classes. For on-site digital access—such as the use of OPAC, e-books, and online journals within the library premises—most usage was recorded between 7:00 PM and 11:00 PM, suggesting that students engaged in independent study during evening hours inside the library, as shown in Figure 2 below.

On a broader timeline, the months of October, December, March, and May recorded the highest volume of library activity, corresponding with midterm and final examination periods. In contrast, visits significantly declined during semester breaks and holidays.

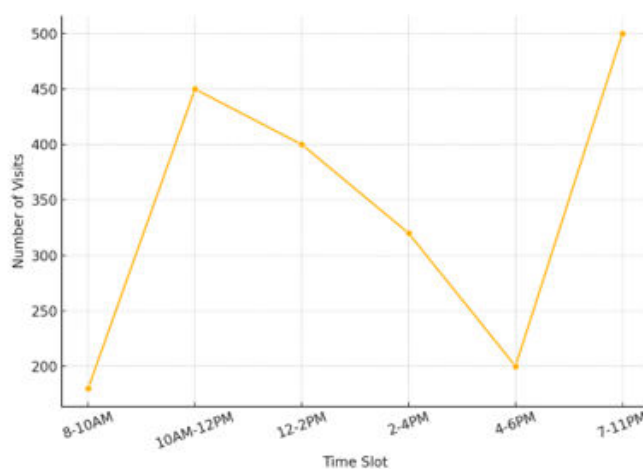


Figure2. Library Visits by Time Slots

Resource Access Behavior

In terms of material use as reflected in Figure 3, digital resources—including e-books, online journals, and institutional repositories—were accessed two to three times more frequently than physical books. This trend accelerated after the



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pandemic and continued despite the resumption of in-person classes. Among printed materials, the most circulated were textbooks, reviewers for board exams, and local theses.

Top accessed digital sections included:

1. Online journal databases (e.g., JSTOR, ScienceDirect)
2. Online Public Access Catalog (OPAC)
3. E-learning platforms linked to the LMS

Students in graduate programs displayed higher engagement with academic databases, while undergraduates preferred multimedia content and open-access resources.

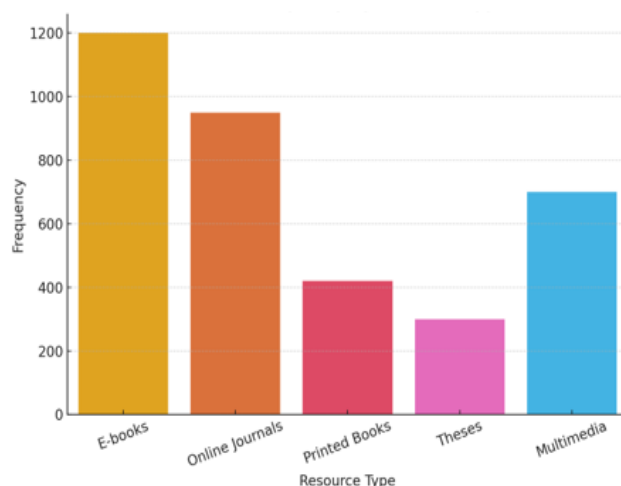


Figure3. Access Frequency by Resource Type

Physical vs. Digital Use

The transition from the pandemic to the post-pandemic period reflected a shift from physical to digital library use. In AY 2021–2022, during the height of remote learning, over 75% of transactions were online. By AY 2023–2024, while there was a return to physical visits, digital usage remained dominant, especially for off-campus access. As reflected in Figure 4.

The implementation of blended learning modalities further influenced usage patterns. Students used the library's physical space for group work and device charging, while digital platforms were used for research, asynchronous activities, and online submissions. This hybrid usage supports previous findings on the importance of flexible and multipurpose library environments.

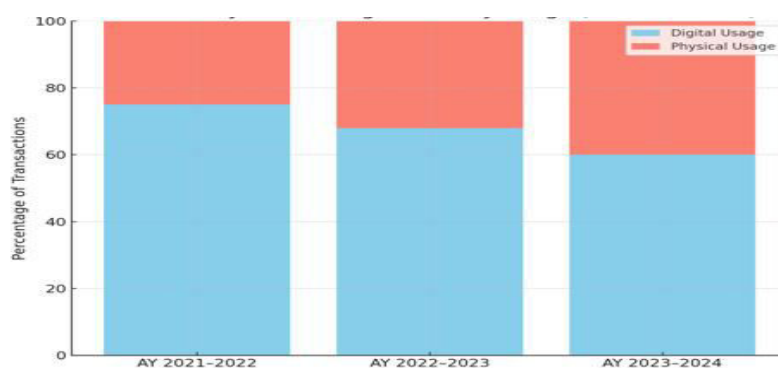


Figure4. Trend of Physical vs. Digital Library Usage (AY 2021-2024)



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Findings and Discussion

To explore the relationship between library utilization and academic performance—as well as user satisfaction and perceived usefulness—a focused quantitative analysis was conducted using data collected during the month of November 2023, a strategic period prior to final examinations. This timeframe reflects peak student engagement with academic resources, both physical and digital. The dataset consisted of approximately 500 unique student users per day, totaling around 11,000 student visits over 22 school days, with the library operating from 8:00 AM to 5:00 PM.

A stratified random sample of 200 students from the dataset was selected and ethically cross-referenced with cumulative GPA records to investigate academic trends. Utilizing Pearson correlation analysis, the study revealed a moderate positive correlation ($r = 0.51$, $p < 0.01$) between the frequency of library visits and academic performance. This statistically significant result confirms that students who accessed library services more often during the exam preparation period tended to achieve higher GPAs than those who visited less frequently. This finding affirms prior research by Lasig and Collantes (2022), who observed similar correlations in teacher education programs, and extends its application in the broader HEI context.

To enrich the quantitative data, an online user survey was conducted among 150 student respondents from the same period. Results showed that 92% of respondents found the library "very helpful" for exam preparation. Moreover, 78% utilized both physical (e.g., printed books, study spaces) and digital (e.g., OPAC, e-journals) services, suggesting a strong preference for hybrid engagement. Additionally, 85% reported high satisfaction with the library's quiet environment and reliable internet connectivity, with key benefits including access to board exam reviewers, thesis manuscripts, and LMS integration through stable Wi-Fi.

As visualized in Figure 5, perceived usefulness of the library increases with visit frequency, supporting the hypothesis that regular engagement with library services not only enhances academic achievement but also improves students' satisfaction and learning experience.

Expanded Implications for Philippine HEIs

These findings underscore critical implications for academic policy and institutional practice, particularly in Philippine HEIs adapting to post-pandemic realities:

1. **Digital Transformation:** The continued dominance of digital access necessitates sustained investment in remote-access portals, e-resources, and bandwidth infrastructure, aligned with the Education 4.0 framework emphasized by Cadiz et al. (2024).
2. **Hybrid Service Design:** The strong preference for both digital and physical resources supports the shift toward hybrid-ready library models, where learning spaces and systems are designed to seamlessly integrate traditional and virtual services.
3. **Data-Driven Library Strategy:** Given the clear correlation between usage and GPA, predictive analytics and usage monitoring (as advocated by Sy et al., 2024) should inform interventions, such as personalized alerts, academic support nudges, and resource recommendations.
4. **Curricular Alignment and Outreach:** The underutilization in some departments suggests the need for improved alignment between library services and academic programs. Librarians must collaborate with faculty to embed library instruction in course delivery and promote subject-specific collections.
5. **CHED Policy Relevance:** These insights validate the objectives outlined in CHED Memorandum Order No. 24, s. 2015, particularly the integration of library services into teaching and learning frameworks. The library's role as both a learning hub and a student support center remains essential in ensuring quality, accessibility, and academic equity in higher education.

In sum, this study contributes both empirical data and policy-aligned insights that can inform ongoing library modernization efforts in state universities and colleges across the Philippines.



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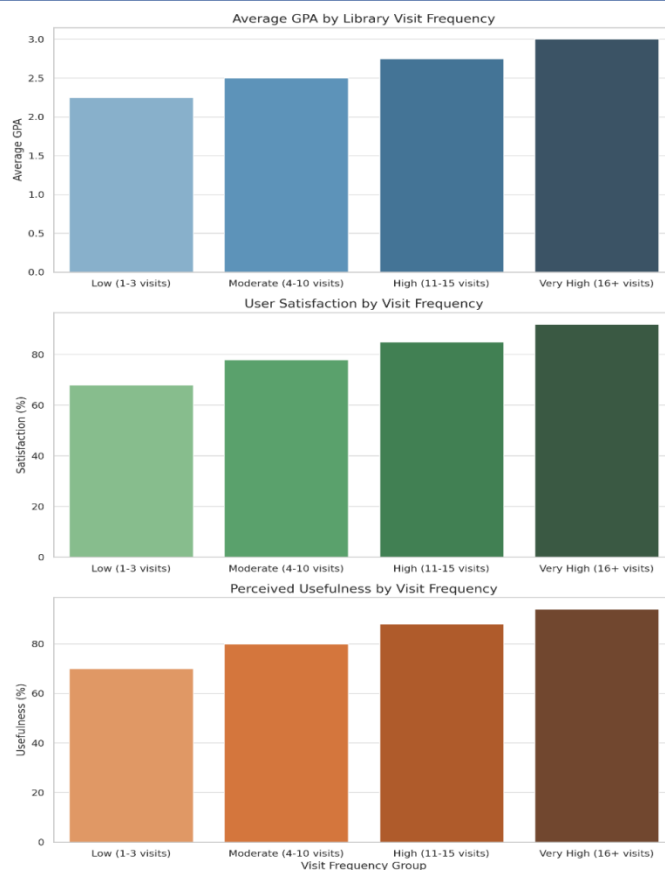


Figure5. Perceived Usefulness by Visit Frequency

Insights and Interpretations

The analysis of usage patterns and user feedback reveals several actionable insights for academic library management, particularly within the evolving context of Philippine higher education. The findings from November usage data, student GPA correlation, and user survey responses provide a solid empirical basis for these interpretations.

1. Sustained Digital Investment:

The dominance of digital access—evidenced by the high frequency of online resource usage and strong satisfaction with virtual platforms—underscores the continued need to invest in robust digital infrastructure. This includes expanding off-campus authentication mechanisms, enhancing campus internet bandwidth, and maintaining updated subscriptions to academic databases. These investments are critical to supporting students engaged in blended learning, asynchronous coursework, and off-site academic research. They also align with the shift toward Education 4.0, as noted in the broader literature (Cadiz et al., 2024; Mariano & Aytona, 2023).

2. Strategic Space and Schedule Management:

The concentration of physical library visits between 10:00 AM and 2:00 PM suggests a need to optimize staffing schedules and adapt space configurations during these peak hours. Redesigning library spaces to accommodate both collaborative group work and quiet individual study will better serve user needs. As cited by students in the survey, the availability of stable Wi-Fi, board exam reviewers, and functional study zones significantly enhanced their academic preparation.

3. Academic Impact and Engagement Promotion:

The observed moderate positive correlation ($r = 0.51$, $p < 0.01$) between frequency of library visits and academic performance (Figure 5) affirms the value of sustained library engagement. These results reinforce earlier studies (e.g., Lasig & Collantes, 2022) that emphasized the role of academic libraries in promoting better learning outcomes.



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Accordingly, there is a need to promote library services more intensively, especially to departments and student sectors that exhibit lower levels of engagement. Targeted orientations, librarian-faculty partnerships, and embedded information literacy sessions may raise awareness and utilization across the university.

4. Alignment with CHED Policy:

Finally, these insights resonate with the mandates of CHED Memorandum Order No. 24, s. 2015, which calls for the integration of academic libraries into institutional teaching, learning, and research ecosystems. Aligning library operations with the academic calendar—such as ramping up services during midterms and finals—and ensuring data-informed service delivery can enhance the library's relevance, visibility, and measurable impact on student success. Together, these interpretations support the strategic development of libraries as hybrid, user-responsive spaces that contribute not only to academic performance but also to institutional quality assurance and compliance with national higher education standards.

VI. CONCLUSIONS

This study analyzed the patterns of library utilization among students and faculty at Negros Oriental State University (NORSU) from Academic Year 2021 to 2024, guided by five core objectives.

First, in terms of user demographics and usage frequency, the data confirmed that undergraduate students—especially those from the Colleges of Education, Engineering, and Arts and Sciences—comprised 87% of total log-ins. This finding underscores the vital role of the academic library as a primary learning support hub for undergraduate education.

Second, with respect to time-based usage patterns, peak physical visits occurred between 10:00 AM and 2:00 PM, coinciding with class breaks. Digital access within the library premises was more prominent between 7:00 PM and 11:00 PM, especially in high-demand academic months such as October, December, March, and May. These trends illustrate that students rely on both physical and digital library services depending on academic schedules and study preferences.

Third, the study found a marked preference for digital resources. E-books, online academic journals, and the Online Public Access Catalog (OPAC) were accessed two to three times more often than printed books. This behavioral shift highlights the need for a hybrid-ready service model that maintains both digital and print collections while ensuring ease of access, connectivity, and platform reliability.

Fourth, the relationship between library use and academic success was quantitatively established. A Pearson correlation analysis showed a moderate positive correlation ($r = 0.51$, $p < 0.01$) between frequency of library visits and GPA. Complementary survey data revealed that 92% of students found library services very helpful for exam preparation, with high satisfaction levels for both study space and digital platforms. These results affirm that library usage is not only a matter of access but also directly tied to perceived academic benefit.

Fifth, the study revealed areas for strategic improvement, including service underutilization in some academic departments, infrastructure bottlenecks during peak hours, and the need for stronger promotional campaigns.

To address these findings, the following insights are emphasized as actionable directions:

1. Invest in flexible digital infrastructure to support continuous access, especially for off-campus and asynchronous users.
2. Optimize space and personnel management by aligning staffing schedules and space layouts with peak usage times.
3. Promote library services through targeted orientations and department-level outreach, particularly in colleges with lower engagement.
4. Enhance integration with the university's LMS and academic calendar to synchronize services with instructional activities.
5. Adopt data-informed management tools, such as usage dashboards and analytics, to continuously monitor and refine service delivery.



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Finally, the study reinforces the importance of responsive and inclusive library strategies in a blended learning environment. It aligns with CHED Memorandum Order No. 24, s. 2015, by promoting access, responsiveness, and strategic planning. These insights serve not only as an evaluation of past performance but also as a roadmap for continuous improvement, user-centered innovation, and institutional relevance in the post-pandemic educational landscape.

VII. RECOMMENDATIONS

Based on the findings and conclusions of the study, the following actionable recommendations are proposed to enhance library utilization and align service delivery with evolving academic needs:

1. Enhance Promotion of Underutilized Services

The library should intensify awareness campaigns targeting underutilized services such as citation assistance, research consultations, thesis advising support, and virtual reference services (VRS). Strategies may include short video explainers, social media campaigns, departmental library weeks, and integration into student orientations and LMS announcements to ensure visibility and uptake.

2. Implement Analytics Dashboards for Real-Time Monitoring

Adopt data visualization platforms like Power BI or Google Data Studio to track library usage trends, peak visitation hours, digital resource access, and departmental engagement. These dashboards can enable librarians to make data-informed decisions, deliver timely interventions, and customize services based on real-time user behavior and resource demand.

3. Develop Targeted Orientations and Subject-Specific Resource Guides

Create modular library orientation programs for different user segments (e.g., freshmen, graduate students, thesis writers). Accompany these with subject-specific research guides, video tutorials, and infographics to help users navigate digital databases, citation tools, and OPAC systems more effectively. These digital learning objects can be embedded in LMS platforms for broader reach.

4. Strengthen Faculty Collaboration for Curriculum Integration

Forge deeper partnerships with faculty by embedding library services into course syllabi and instructional content. Librarians should collaborate on the co-development of information literacy modules, curated reading lists, and assignment-based resource packages. This approach promotes active library engagement while supporting course learning outcomes.

5. Expand Hybrid Access and Support Services

To respond to students' blended learning needs, libraries should ensure robust infrastructure for off-campus access, including proxy login systems, mobile-friendly portals, and 24/7 digital support. Enhancing both physical and virtual services will maintain academic continuity and inclusiveness, especially for remote learners or students in extended campuses.

6. Align Library Operations with the Academic Calendar

Extend library hours and deploy focused service campaigns during midterms, finals, and thesis deadlines. Libraries should coordinate closely with academic units to anticipate periods of high demand and adjust staffing, resource availability, and support services accordingly.

7. Institutionalize a Feedback Mechanism for Continuous Improvement

Regularly gather user feedback through satisfaction surveys, quick polls, and suggestion boxes to assess service quality and gather actionable insights. These mechanisms will help refine services in response to user expectations and maintain quality assurance standards set by CHED and institutional mandates.

VIII. ACKNOWLEDGMENT

The author, serving as a campus librarian at Negros Oriental State University (NORSU), expresses her sincere appreciation to the university administration for permitting the use of institutional data essential to this research. She is



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She also acknowledges the invaluable, albeit indirect, contributions of NORSU's students and faculty, whose patterns of engagement with library services formed the empirical foundation of this study.

The author further recognizes the importance of CHED Memorandum Order No. 24, series of 2015, which served as a key reference in aligning this research with national standards for academic libraries in higher education.

Finally, she extends her gratitude to her professional colleagues and mentors whose insights and encouragement supported the successful completion of this scholarly work.

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