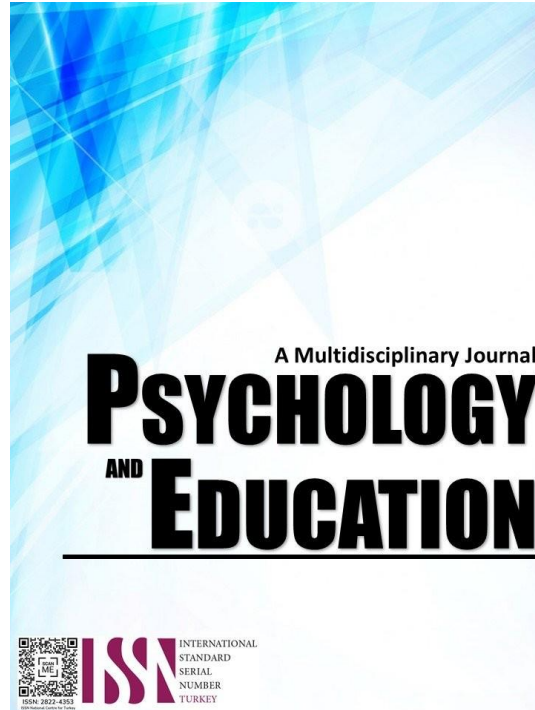


# LIBRARY SPACE DESIGN AND USER ENGAGEMENT OF COLLEGE STUDENTS



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## Library Space Design and User Engagement of College Students

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### Abstract

Library spaces play a crucial role in fostering user engagement, particularly for students in academic settings by creating welcoming environment that blend inspiring spaces with engaging resources and programming, academic libraries can make significant contributions to overall student engagement. This study employed descriptive regression research design to determine the influence of library space design on student engagement. A total number of 100 students from selected schools in Regions XI and XII were the respondents of the study using convenience sampling technique. Mean and simple linear regression analysis were employed to analyze the data. The findings showed that student's level of perception towards library space design was very high while level of user engagement was found to be high. Among the indicators of library space design, aesthetics and atmosphere got the highest mean ratings while on the aspect of user engagement, library visits yielded the highest mean rating. Moreover, the results showed that student's perception on the library space design influence user engagement. Base on the findings it is recommended that the school administrators should prioritize allocating adequate resources for continuous library space renovation, conduct comprehensive assessments to library personnel and users, and streamlining access to library resources to meet expectations of students who are comfortable with technology.

**Keywords:** *library information science, library space design, user engagement, quantitative statistics, Philippines*

### Introduction

The library space design is important factor that will motivate student to come to the library and engage with its program and services. It is important that academic libraries must facilitate library lay out and areas, aesthetic and atmosphere, noise management, collection availability and accessibility, technology integration to further improve students' library visits, resource utilization, facilities utilization, and library program participation. The term library space relates to various factors which the improvement of each factor affect the over-all appeals of this academic facility and furthermore improves students learning engagement.

The relationship between library space design and user engagement has garnered increasing attention globally. Studies have consistently demonstrated that well-designed library spaces, incorporating elements such as comfortable seating, ample lighting, designated quiet zones, and collaborative areas, can significantly enhance student engagement and academic success (Sarmah & Rahman, 2021; Goel & Morvis, 2021). Breivik (2021) used survey and observation methods to rate student engagement levels in campus libraries, finding engagement was higher in spaces with comfortable, flexible furniture and natural lighting. Furthermore, important design factors for promoting engagement have been brought to light in recent research like incorporating cozy, homey furniture and adaptable floor plans focused on the community to foster comfort and social interactions (Angell & Kudravi, 2022). As people embrace the digital age, the actual value of school libraries is found not just in the material they contain, but also in the transforming experiences and possibilities they bring to students (Shaji, 2023). Aesthetically appealing environments with comfortable seating, natural elements, artwork, and modularity foster a sense of belonging that emotionally engages users (Brône et al., 2022).

On a global scale, research has explored the impact of library spaces on user engagement, with varying findings across different regions and contexts. In developed countries like Germany and the United States, modern and flexible library spaces have been associated with increased student engagement and improved staff interactions (Beyer, 2022; Williams, 2021). However, in other regions like Portugal and certain areas of the United States, open layouts have also been linked to distractions and disruptions for librarians (Pinto, 2020; Park, 2020).

In the Asian context, while studies have highlighted positive student outcomes resulting from library renovations in places like Hong Kong (Chow, 2023), there is a scarcity of research specifically examining the perspectives of librarians and staff in these evolving spaces. China, with its rapidly expanding tertiary education system, has been actively modernizing academic library facilities and services to promote active learning, providing valuable insights into the links between building upgrades and user engagement in a developing country context (Li, 2020).

Locally, in the Philippines, the landscape presents a contrasting picture. While some institutions in Manila have experienced positive upgrades for librarians in next-generation academic libraries (Razon, 2021), traditional settings persist in other regions. Studies conducted within the Philippine higher education context have consistently recommended optimizing library spaces for improved student use and engagement, including factors such as comfort, flexibility, ambiance, power access, lighting, and designated quiet and collaborative zones (De Las Peñas et al., 2021; Uy et al., 2020; Salangsang & Edrada, 2020).

In Kidapawan City and neighboring areas, many libraries have experienced low utilization due to poor ambiance, small spaces, and uninviting environments for study and research. Conversely, the recent inauguration of the state-of-the-art learning and information

center at the University of Mindanao exemplifies how thoughtful spatial design can enhance user experience and promote active learning, with its massive footprint, ample seating, and dedicated spaces for various activities (Francas, 2023; Loder, 2017; Yoo-Lee et al., 2015; Allard, 2022; Cranz & Cha, 2020).

Given these contrasting scenarios of high and low library utilization, this study aimed to explore the influence of library space design on user engagement within the local context. By examining the factors that contribute to effective spatial design and their impact on student involvement, this research sought to provide insights and recommendations for optimizing library spaces to better serve the needs of the community.

## Research Questions

The study sought to determine the influence of library space design on user engagement among college students. Specifically, the study sought answers to the following questions:

1. What is the perception of the respondents on the library space design in terms of:
  - 1.1. layout and areas;
  - 1.2. aesthetics and atmosphere;
  - 1.3 noise management;
  - 1.4. collection availability and accessibility; and
  - 1.5. technology integration?
2. What is the level of library user engagement among college students in terms of:
  - 2.1. library visits;
  - 2.2. resources utilization;
  - 2.3. facilities utilization; and
  - 2.4. library program participation?
3. Is there a significant relationship between library space design and user engagement among college students?
4. Does the library space design significantly influence on user engagement among college students?

## Literature Review

This section presents the related literature and studies which were reviewed and discussed to establish the sufficient background needed by researcher and readers in order to fully understand the variables of the study. Specifically, this chapter discussed the library space design, benefits of library space design, and library user engagement.

### Library Space Design

As libraries continue to evolve as central community hubs advancing learning, creation, and exchange, deliberate design considerations arise spanning layouts, aesthetics, acoustics, access to knowledge resources, and embedded technologies. Beyond preserving valuable contemplative refuges, contemporary spaces must additionally facilitate dynamic peer engagements, hands-on tinkering, and multimedia production bridging physical and virtual platforms. Transforming facilities to meet these multidimensional needs while retaining architectural symbolism requires coordinated input across numerous stakeholders.

Mehtonen (2016) discussed that physical space constitutes both the functional and aesthetic qualities of the library. As to functionality, library space should be flexible and diverse. To be flexible, the library had to have an open floor plan free of unnecessary permanent constructions that would obstruct any future modifications to the layout of the space. Furthermore, it is imperative that the technical infrastructure, including electrical systems and communication networks, facilitate the adaptable restructuring of library operations. Diversity of physical space involves increasing the number of new services libraries can offer in person while also improving the physical space's aesthetic appeal. Additionally, the libraries are built to support many uses in one area and provide a variety of settings to meet the demands of its users today. They require an environment that fosters creativity, social learning, the development of new information technology skills, and the stimulation of inquiry-based thinking (Beneyat-Dulagan, & Cabonero, 2023). Due to the pandemic, the closure of library facilities has highlighted the need to develop and promote digital/virtual places that can fulfill the same demands as physical spaces (Evgenia et al., 2021). However, customers continue to appreciate physical library space because it provides a unique experience that cannot be recreated online. Libraries are emerging into third spaces where users can interact in both physical and virtual worlds to broaden their learning and produce new knowledge.

Observational studies highlight the impact of seating arrangements, safe sightlines, and navigation tools on movement and wayfinding (Brône et al., 2022). Atmospheric qualities including lighting, color schemes, artwork, and furnishings shape perceptions of comfort critical for concentration (Navarrete, 2022). Proactive noise zoning, masking systems, community norms, and enforcement policies preserve multifaceted functionality (Asher et al., 2021). Strategic integration of high-demand resources balances necessary de-duplication offloading with on-site browsing (Nadal et al., 2020). Ubiquitous power, cutting-edge software, innovative service points, and media studios match academic rhythms (Regalado & Smale, 2021). Together these evidence-based spatial factors help libraries continually earn campus stakeholder trust through responsive, sustainable transformations affirming enduring value.

**Library Layout and Areas.** The goal of library space renovation over the years has been to raise the profile of the library by providing new learning spaces and technology. When designing a library, several key areas and spaces need to be considered. These include collection space, IT space (for public use), seating space/workspaces (for public use), staff work space, meeting spaces (for public use), and sanitary facilities. These areas cater to the diverse needs of library patrons, ensuring a functional and welcoming environment.

Many times, this includes working with campus partners to ensure students get the best services, expertise, and meaningful learning spaces (Hollandsworth, 2018). It is crucial to have the appropriate infrastructure in place for patrons to enter and utilize these redefined spaces. It was crucial to match the furniture to the intended purposes of the spaces (Stanwicks, 2016). While keeping in mind that students frequently use spaces designed for one purpose for other purposes, it is also essential to consider the requirements of students working independently (Andrews, Wright, et al., 2016). Moreover, other studies identified the usefulness of library space and design like: The study of Koontz and Gubbin (2010) stating that library buildings are typically organized into distinct functional areas to accommodate different user needs and activities. Academic libraries often have designated quiet study areas, group study rooms, computer labs, and spaces for individual research and reading (Lushington, 2008). Many public libraries devote sections to children's materials, young adult collections, and meeting rooms for community programs (Dewe, 2006). Effective library design also incorporates elements like clear signage, ample lighting, and accessible facilities to enhance the user experience (Koontz & Gubbin, 2010). Libraries increasingly dedicate spaces for new technologies, multimedia production, and collaborative learning in response to evolving user requirements (Lushington, 2008).

**Library Aesthetics and Atmosphere.** Aesthetic is the form and beauty of the library that makes it appealing to people who use it. This is called library aesthetics. The painting and color scheme of the library building, the signs, floor plans, furniture, art pictures, landscaping, lighting, airflow, and other things that make up the aesthetics of a library are all examples of library aesthetics.

Isaac (2019) says that aesthetic facilities are those things in libraries that make the indoor and outdoor environments more beautiful and appealing. As Handa (2021) says in *Innovative Library Services through Aesthetic Library Design*, the choices you make about how the library looks should send a message about the experience people will have as a whole. Before anything else, it needs to be chosen whether the library will be more formal and traditional, more modern and open, or a mix of the two. The inside of the building should also show off local culture to interest both people who live in the area and people who are interested in art from far away. Shaji (2023) added that school libraries provide students with a peaceful and comfortable atmosphere in which to concentrate, study, and do research. Unlike the distractions of online browsing, libraries provide a distraction-free environment for students to focus on their academic endeavors. Furthermore, the actual presence of books and resources at a library can arouse curiosity and encourage exploration, leading to a deeper grasp of issues beyond what a quick Google search can provide. Mehtonen (2016) discussed that the interior of a library reflects the aesthetic aspects of the building. The space needs to be beautiful cozy, and conducive to various moods in the atmosphere. The school's library should be a distinctive and iconic feature that blends in harmony with the surrounding area. Additionally, the fundamental elements of the library as an organization ought to be symbolically represented in some way through its architecture.

**Library Noise Management.** Managing noise effectively remains a pressing yet complex challenge as contemporary libraries evolve more open, blended spaces facilitating both individual quiet study and lively collaboration. With flexible furniture arrangements and less sound barriers, noise can easily escalate and disrupt concentration (Williams, 2019).

However, overly silent environments also hamper the growing needs for group interactions and hands-on activities. Recognizing libraries as diverse ecosystems serving varied functions, rather than homogeneously quiet spaces, underpins successful modern strategies (Applegate, 2019). These require coordinated efforts across design, policy, and community engagement. Though no consensus exists on optimal decibel levels (Asher, 2021), zoning different sound expectations through spatial seating arrangements, signage, and floorplan flow help signal norms (Cha & Kim, 2015). Physical enhancements like sound-masking materials, ambient music, and accessible bookable rooms also grant flexibility.

Crucially, patrons must cooperate in moderating their own noise production while respecting others' needs (May & Swabey, 2015). Libraries can encourage ownership through participatory policy crafting and motivational messaging. Staff modeling through reminders and positive reinforcement additionally shapes social dynamics. Sufficient administrative commitment and walk-through monitoring prove critical for implementation (Most, 2021). Overall fostering a climate of mutual understanding, diverse spatial configurations, shared noise policies, and collective responsibility offers the most balanced path forward in ensuring libraries ethically meet both individual and collaborative user needs. This undertaking promises rewards but also continued evolution through localized community input and assessment.

**Library Collection Availability and Accessibility.** Library Collection Availability refers to the presence of resources physically located within the library. It encompasses the materials such as books, films, or magnetic media that are accessible to library patrons within the library premises. Accessibility in libraries goes beyond mere availability. It deals with the design of products, services, environments, and systems to ensure they are usable by people with disabilities and considerations related to storage, display, and transmission of information resources to users promptly.

Various types and sizes of libraries exist to meet the specific needs of the community they are intended to serve (Mondal, 2021). In

addition, Shaji (2023) added

that school libraries provide friendly environments that cater to students with a diverse learning need and learning styles. They offer resources including large-print books, CDs, and multimedia products to students who have visual impairments, learning difficulties, or language problems. Librarians collaborate closely with teachers and learning support personnel to discover and provide relevant materials for students who require extra assistance. Furthermore, because various kids flourish in different learning situations, school libraries frequently provide quiet places, sensory-friendly locations, and flexible seating alternatives. School libraries guarantee that every student has the opportunity to access and engage with knowledge effectively by developing inclusive environments that support varied learning styles and requirements.

**Library Technology Integration.** The development of digital space was seen to have affected libraries as physical spaces in three main ways. First, it was seen that the actual library area was becoming more technologically advanced, relying more on the use of various electronic devices like computers and automated libraries. It was also believed that there was complexity surrounding the interaction between digital and physical space. Thirdly, Libraries are facing more competition from various methods of communicating literary and cultural content as the digitization process progresses. Thus, it is possible to view the reconceptualization of the library as a physical location as providing fresh prospects for the revitalization and increased legitimacy of the library institution in the digital age (Mehtonen, 2016).

The advent of digital technologies and services has brought about a transformation in the notion of a library. Available electronic resources for improving research and education have only been used in part and not entirely. (Bashir et.al, 2019). Digital literacy is another important part of modern education, and school libraries actively promote it. Librarians work with teachers to educate children on how to explore internet databases, conduct sophisticated searches, and analyze digital content critically. School libraries enable students to grasp the full potential of the internet while remaining skeptical of online material by bridging the gap between traditional and digital resources.

Subscription-based academic databases, which offer reputable sources and in- depth study materials not readily available through public internet searches, are frequently available through school libraries. Librarians instruct students on how to use these databases, including how to do sophisticated searches, refine their results, and obtain scholarly papers. School libraries enable students to exploit the full potential of the internet while critically evaluating online material by bridging the gap between traditional and digital resources (Shaji, 2023).

Meanwhile, ensuring seamless access to collections and technology integration is equally crucial in modern library design. Strategic resource placement and cutting-edge tools like media studios align with contemporary academic and social rhythms (Nadal et al., 2020; Regalado & Smale, 2021; Applegate, 2019). Simultaneously, libraries are embracing digital spaces and services to complement their physical offerings, bridging the gap between traditional and digital resources (Mehtonen, 2016; Evgenia et al., 2021; Bashir et al., 2019).

### User Engagement

User engagement has become a pivotal focus for educational institutions seeking to improve student outcomes. Recent research has increasingly examined the role academic libraries can play in supporting and enhancing user engagement through their spaces, resources, programs, and services.

User engagement in academic libraries encompasses various dimensions, including library visits, resource utilization, facilities utilization, and program participation. Recent research highlights the significance of these factors in promoting active learning, motivation, and overall student success (Lu, 2020; Fallin, 2016; Stephens, 2020). In the study of Lu (2020) at Ashford University, San Diego, user engagement refers to the commitment of students in terms of dedicating their time and exerting effort towards activities that serve an academic objective.

Moreover, educational institutions assume a pivotal position in the promotion of effective instructional practices aimed at enhancing student engagement and eventually fostering student success. Institutions have the potential to enhance student engagement and improve overall student accomplishment by promoting student participation in high- impact activities, including counseling, tutoring, utilizing writing centers, participating in learning communities, and accessing other supportive services. The extent of participation directly affects the level of engagement, which in turn influences the student learning process.

Numerous studies have demonstrated that the implementation of instructional techniques that actively engage learners has been linked to increased levels of student satisfaction and enhanced rates of student retention in educational settings. According to Fallin (2016), contemporary students not only anticipate having access to library collections but also desire their requirements to be fulfilled in the context of a modern library. Users expect to access contemporary technology and a diverse range of educational and social environments.

Student engagement can be defined as the time and effort students devote to activities that are empirically linked to desired outcomes of college and what institutions do to induce students to participate in these activities. Higher education institutions, since the beginning of implementation, whether for-profit or non-profit, are considered big businesses. Every business has a plan, purpose, and goal. Higher



education institutions' customers are their students. Students pay for a service, which is education. In return, students receive the best possible education the institution of their choice can provide. With that in mind, not every institution provides the same quality service. The consumers must research these institutions individually to find an institution that fits each student's particular needs (Stephens, 2020).

**Library Visits.** Library visits refer to the act of going to a library, usually for a short period. When people visit a library, they may engage in various activities such as reading, studying, borrowing books, or accessing other resources. Public libraries, in particular, serve as valuable community spaces where individuals can explore information, learn, and connect with others.

In the survey and observation methods to rate student engagement levels in campus libraries used by Breivik (2021), finding engagement was higher in spaces with comfortable, flexible furniture and natural lighting. Students reported furniture comfort enabled prolonged periods of studious concentration. There were two main ways that libraries were seen to serve as social spaces: either as physical locations for social interaction or as a component of the public realm in the institution as a whole. Social engagement was understood to include a range of interpersonal relationships and activities as well as being directly related to regular library use. Social interaction between library workers and users was thought to be the main source of social interaction. A more recent development is the interaction among library users themselves, particularly when it is a deliberate design intention. By designating certain spaces for social contact, for instance, both libraries sought to encourage this form of communication (Methonen, 2016).

Emerging research indicates that efforts to emotionally engage students cannot be limited to physical spaces alone. Subtle environmental cues like plants, art, and empathy from staff also enhance students' feeling of being welcomed rather than out of place (Regalado & Smale, 2022; Turner et al., 2021). Furthermore, important design factors for promoting engagement have been brought to light in recent research like incorporating cozy, homey furniture and adaptable floor plans focused on the community foster comfort and social interactions (Angell & Kudravi, 2022). Creating welcoming environments that blend inspiring spaces with engaging resources and programming is key to fostering user engagement. Interactive tools like puzzles, maker spaces, and collaborative zones actively engage users in hands-on learning experiences (Wright et al., 2022; Regalado & Smale, 2021; White & White, 2021). Additionally, efforts to emotionally engage students extend beyond physical spaces, with environmental cues like plants, art, and empathetic staff contributing to a sense of belonging (Regalado & Smale, 2022; Turner et al., 2021).

**Library Resource Utilization.** In library resource utilization the measure of how much available library resources are currently being used. It helps libraries plan more effectively to ensure productivity. By assessing resource utilization, libraries can optimize their services and offerings to meet the needs of patrons efficiently.

Recent data demonstrates that academic libraries can make significant contributions to student participation by making use of their facilities and services. Studies conducted in the last few years by Wright et al. (2022), Regalado and Smale (2021), and White and White (2021) show how interactive tools—such as puzzles and maker spaces—provide engaging platforms for motivation and prolonged involvement in active learning, discovery, help-seeking, and knowledge creation behaviors in libraries.

The significance of school libraries may appear diminished in today's digital environment, where information is simply a click away. With search engines like Google allowing fast access to massive amounts of knowledge, one could wonder if physical libraries within educational institutions are still necessary. Despite the convenience and speed of internet resources, school libraries continue to play an important role in supporting student learning, critical thinking, and personal growth. They are far more than just a library; they are critical hubs for education, research, cooperation, and the development of essential skills. They are excellent resources for developing well-rounded individuals, critical thinkers, and lifelong learners who are ready to prosper in a fast-changing world. As people embrace the digital age, the actual value of school libraries is found not just in the material they contain, but also in the transforming experiences and possibilities they bring to students (Shaji, 2023).

Holder and Lannon (2021) surveyed students during the pandemic's virtual learning pivot about how existing and potential library online spaces, tools, and services could better support engagement with their courses, cognitively and beyond. The student feedback highlighted virtual design needs around not just robust digital resources and collections, but also librarian availability for real-time assistance and spaces facilitating online collaboration with peers. Larsen et al., (2021) on the other hand mentioned that thoughtful digital designs help remote users feel involved, supported, and connected. User experience assessments have shown that important website enhancements such as chat support, user endorsements, and student highlight reels can successfully foster a sense of community online.

**Library Facilities Utilization.** Assessing usage of core library facilities including buildings, rooms, service points, technology, equipment, and infrastructure provides critical data to inform planning. Gate traffic metrics via door counters capture overall patron visits but additional metrics like seating sweeps, computer login statistics, scanner usage numbers, study room bookings, and event attendance help detail actual facility interactions (Asher et al., 2022). Comparing occupancy rates and usage across facilities components, service types, patron groups and environmental settings reveals complex dynamics driving or hindering utilization. Surveying users and mapping journeys further targets experience barriers and motivations related to library facilities themselves versus just housed resources (Nitecki & Simpson, 2022).

In the digital realm, virtual library spaces, online tools, and remote programming adapted offerings like game nights, panels, and book

clubs to counteract campus closures during the pandemic (Holder & Lannon, 2021; Regalado & Smale, 2021). User experience assessments have shown that website enhancements like chat support, user endorsements, and student highlight reels can successfully foster a sense of community online (Larsen et al., 2021).

Analysis methodology should account for annual and semester cycles while drilling hourly and daily ebbs and flows in granular detail to identify congestion and gaps. This informs operating hours, space reconfigurations, furniture and technology investments, wayfinding, accessibility barriers, and beyond (Regalado & Smale, 2021). Explicit facilities usage assessment conveys stewardship and helps secure funding for upgrades aligned to verified student and institutional needs. Demonstrating responsibility through data and community input sustains the library's physical footprint as an essential campus hub. Ongoing evaluation of core library facilities utilization, using mixed methodologies and precise time units analysis, provides administrator guidance and user benefit through purposeful change. This ultimately strengthens the library's on-campus position.

Notably, school libraries play a crucial role in supporting student learning, critical thinking, and personal growth, offering transformative experiences beyond just information access (Shaji, 2023). They provide inclusive environments catering to diverse learning needs and styles, bridging traditional and digital resources while promoting digital literacy (Mondal, 2021). Furthermore, school libraries serve as collaborative learning spaces and safe havens for social interactions and community building (Merga, 2021; Wan et al., 2018; Areaton-Galan, 2016; Kociubuk, 2016).

**Library Program Participation.** Library program participation is the engagement of community members in various programs and activities offered by libraries. These programs can include workshops, events, reading clubs, educational sessions, and cultural activities. By actively participating in library programs, individuals benefit from learning opportunities, social interactions, and community engagement. According to Suharso et.al (2019), libraries now function as places for people to come together in addition to being venues to gather, organize, and offer information sources. Aside from being a place to meet, Merga (2021) added that school libraries can be an extremely valuable safe place for frequent users in the middle school year since oftentimes library staff cultivates a welcoming and supportive environment thus that it serves a wide range of objectives, supporting both quiet time and social and vibrant activities.

School libraries can also be used as collaborative learning spaces for group projects, discussions, and project-based learning. Libraries, in contrast to the lonely nature of online research, provide physical venues for students to gather, discuss ideas, and collaborate on projects. These collaborative settings promote the development of important interpersonal skills, cooperation, and cooperative problem-solving. School libraries that embrace collaborative learning educate students about the collaborative nature of the modern workplace and provide them with critical skills for future success. (Shaji, 2023). Public libraries serve as social spaces on a variety of scales. They are not only institutions for acquiring and sharing information but also places for social interaction and community building. Libraries can be designed to enhance the user experience and create a sense of attachment, which can positively impact users' attitudes toward the space (Wan et. al, 2018). In the information society, libraries have evolved to become educational, cultural, and social centers, offering a wide range of services to meet the increasing and diversifying social needs of their users (Areaton-Galan, 2016). They also serve as spaces for children and teens to collaborate, shape shared spaces, and engage with the world in a loosely supervised environment, potentially informing better design of library spaces for children (Kociubuk, 2016).

By maintaining possibilities for interactive learning and community-building activities, remote programming that adapts library offerings like game evenings, panels, and book clubs counteracted campus closures (Regalado & Smale, 2021). Embedded Initiatives: By collaborating with academic courses on projects like joint research and exhibit creation, libraries provided real-world settings that allowed students to engage in significant intellectual activities (White & White, 2021).

#### Relationship of Library Space Design and User Engagement

Library spaces play a crucial role in fostering user engagement, particularly for students in academic settings. Recent research highlights how thoughtful design elements like comfortable furniture arrangements, natural lighting, cozy aesthetics, and flexible layouts can enhance students' emotional connection to the library and promote prolonged, focused study sessions (Breivik, 2021; Regalado & Smale, 2022; Angell & Kudravi, 2022).

Furthermore, libraries are increasingly integrating interactive tools like puzzles, maker spaces, and collaborative zones to actively engage users in hands-on learning experiences that inspire motivation, help-seeking behaviors, and knowledge creation (Wright et al., 2022; Regalado & Smale, 2021; White & White, 2021). By creating welcoming environments that blend inspiring spaces with engaging resources and programming, academic libraries can make significant contributions to overall student engagement. Effective library design, considering user needs and behaviors related to layout, aesthetics, noise mitigation, resource accessibility, and technology integration, plays a crucial role in fostering user engagement (Asher et al., 2021; Navarrete, 2022; Nadal et al., 2020; Regalado & Smale, 2021).

Studies have consistently demonstrated that well-designed library spaces, incorporating elements such as comfortable furniture, natural lighting, designated zones, and collaborative areas, can significantly enhance student engagement and academic success (Sarmah & Rahman, 2021; Goel & Morvis, 2021; Breivik, 2021; Angell & Kudravi, 2022; Brône et al., 2022). By continually transforming to provide responsive, sustainable spaces and resources aligned with evolving needs, libraries can earn stakeholder trust and affirm their

enduring value as cherished hubs nurturing user engagement (Asher et al., 2021; Navarrete, 2022; Brône et al., 2022; Cha & Kim, 2015; May & Swabey, 2015; Most, 2021; Williams, 2019; Applegate, 2019).

Studies have consistently demonstrated that well-designed library spaces, incorporating elements such as comfortable seating, ample lighting, designated quiet zones, and collaborative areas, can significantly enhance student engagement and academic success (Sarmah & Rahman, 2021; Goel & Morvis, 2021). Breivik (2021) used survey and observation methods to rate student engagement levels in campus libraries, finding engagement was higher in spaces with comfortable, flexible furniture and natural lighting.

Furthermore, important design factors for promoting engagement have been brought to light in recent research like incorporating cozy, homey furniture and adaptable floor plans focused on the community to foster comfort and social interactions (Angell & Kudravi, 2022). As people embrace the digital age, the actual value of school libraries is found not just in the material they contain, but also in the transforming experiences and possibilities they bring to students (Shaji, 2023). Aesthetically appealing environments with comfortable seating, natural elements, artwork, and modularity foster a sense of belonging that emotionally engages users (Brône et al., 2022).

## Methodology

This section discusses the methods and processes in the conduct of the study. This includes the research design, respondents, measures, ethical consideration, sampling procedure, data gathering procedure, and statistical tools that were used in the study.

### Research Design

This study employed a descriptive- regression design to determine the relationship of the library space design and user engagement of college students in Regions XI and XII. According to Creswell (2014), a descriptive-regression design describes the trends and the relationships among variables. It establishes the relationship between a dependent variable from one or more independent variables. A descriptive design was beneficial for this research since the researcher intended to describe the level of library space and student engagement. Meanwhile, regression design was necessary to see whether library space influenced student engagement. Descriptive research designs do not manipulate variables which mean that the respondents of this study would not be subjected to any intervention or treatment whatsoever. The primary concern is the data that was acquired from them (Tan, 2022).

### Participants

The researcher used convenience sampling in selecting the 100 respondents from the five participating higher educational institutions (HEIs) in Regions XI and XII. Convenience sampling is a non-probability sampling technique where respondents are selected based on their accessibility and proximity to the researcher (Etikan et al., 2016). This sampling approach was chosen due to practical constraints in reaching the entire population of interest. Among the higher institutions in Regions XI and XII, one hundred

(100) respondents should be included in this study. In terms of the inclusion criteria, the respondents should be enrolled in the institution as 3rd year or 4th year college students. They should have experienced the library services for a minimum of 2 years in their respective institutions. This means that freshmen students who have been in the institution with below 2 years residency were excluded. The study focused on college students as respondents considering their depth of understanding in terms of experience. The purpose of these criteria is to ensure that only the most suitable respondents would participate and that substantial data and results would be achieved in the process. Meanwhile, respondents who refused to participate in the survey were granted the choice to do so without risking any consequences, penalties, or loss of benefits under the withdrawal criteria.

Within each selected schools among Regions XI and XII, a sampling frame (list) of smaller units based on the 3rd year and 4th year college students was constructed. These students were selected considering their length of stay in the HEIs. A random sample of these smaller units was selected from each of the chosen schools. The respondents who answered the survey were qualified regardless of their program enrolled as long as they met the criteria. The respondents were ultimately the students selected across all the five HEIs chosen earlier. The number of students were evenly distributed, thus requiring 20 respondents from each institution.

### Instruments

A self-made questionnaire was developed by the researcher in order to facilitate the gathering of the needed data. It was divided into two main parts. The first part pertains to coverage of Library space design with 5 indicators: layout and areas, aesthetics and atmosphere, noise management, collection availability and accessibility and technology integration. The second part pertains to User engagement with 4 indicators: library visits, resource utilization, facilities utilization and library program participation. To establish the survey questionnaire's reliability and content validity, it went into the following processes.

First, the survey questionnaire was distributed to 30 selected respondents to answer the instrument that meets the research criteria. Because the intention was just to gather initial perception of respondents for pilot testing, convenience sampling technique was applied. Data gathered were processed and tested using Cronbach Alpha to establish reliability and internal consistency. Results of the reliability statistics got a Cronbach Alpha value of Lay-out and Areas (.790), Aesthetic and atmosphere (.715), Noise management (.709), Resource Collection availability and accessibility (.808), Technology integration (.887), Library Visits (.722), Resource utilization



(.719), Facilities utilization (.776), Library program participation (.866). the Cronbach's Alpha were all above 0.70 which implies that all items tested passed the test of reliability and internal consistency

Second, the survey instrument was submitted to three experts on the variables being studied to establish the content validity of the instrument. The first validator was the former director of USM library and Associate IV of the University of Southern Mindanao and a holder of PhD in Education Major in Educational Leadership. The second validator was the Vice president for Academic Affairs of Cor Jesu College and a holder of PhD in Development Administration and the third was the Program Head of the BLIS Program of Cor Jesu College, a PhD holder. Results of content validity revealed that the overall mean score is 4.55 and interpreted to be as Very Satisfactory. This result indicates that the instrument is found to be very satisfactory in terms of its clarity of language, presentation and organization of topics, suitability of items, adequacy of purpose, attainment of purpose, objectivity and scale and evaluation rating scale.

## Procedure

The study followed a series of processes and procedures to ensure its validity and ethical conduct. Firstly, the researcher secured an endorsement letter from the Dean of the Graduate School to conduct this study. Secondly, the researcher also secured an ethical clearance from the Cor Jesu Research Ethics Committee. Thirdly, after securing the approval letter from the Dean of the Graduate School and ethical clearance from the Cor Jesu College Review Ethics Committee, the researcher secured a letter of approval from the presidents of the schools where to conduct the study. Once approved, the researcher asked permission from the Director/Head Librarian to administer the survey questionnaire in the library to the selected 3rd and 4th year students with an attached consent form. The researcher ensured that the questionnaire administered to the respondents was validated by experts in the field. After administering the questionnaires, the researcher retrieved them on the same day to ensure that the data gathered were secured accordingly. All information gathered and collected by the researcher was kept in the highest level of confidentiality. The data gathered were tabulated, processed, and analyzed solely by the experts and the researcher using the most appropriate statistical tools. Confidentiality was importantly observed when collecting the data, even after the analysis and interpretation. The results of the study will be shared through a published manuscript or to be presented in a local or international conference and Sharing of the findings with the respondents or some other interested individual.

## Ethical Considerations

In conducting the survey, the researchers ensured that the respondents voluntarily participated in the study, and that no harm inflicted to the respondents. The survey questionnaire used in this study did not ask for any personal information from the respondents to ensure the anonymity of the data. Also, the gathered data were treated with confidentiality.

## Data Analysis

Frequency and percentage mean and standard deviation, Pearson Product-Moment Correlation, and simple linear regression were used as statistical tools for the study. The following statistical tools were used in the interpretation of data related to library space design and student engagement. In the context of this study, the mean was used to calculate the average score for each measure of library space design (e.g., layout and areas, aesthetics and atmosphere, noise management, collection availability, accessibility and technology integration) and student engagement (e.g., library visits, library resource utilization, library facilities utilization, library programs participation). The mean provided a central or typical value representing the respondents' perspectives on these measures. This statistical tool was employed to analyze the linear relationship between library space design (independent variable) and student engagement (dependent variable). The correlation coefficient ranges from -1 to 1, with values closer to the extremes indicating a stronger linear association between the two variables. A positive correlation suggests that higher levels of library space design are associated with higher levels of student engagement, while a negative correlation indicates an inverse relationship. Simple linear regression was used to model the linear relationship between library space design (independent variable) and student engagement (dependent variable). It helped determine the best-fitting straight line that summarized the pattern in the data, allowing the researcher to predict student engagement levels based on library space design scores. The regression equation ( $Y = a + bX$ ) provided insights into the nature and strength of the relationship between the two variables.

## Results

The researchers presented the results of the study in four parts, namely, the summary of students' perception on the Level of Library Space Design, followed by the presentation of the results on the level of library users' engagement, and lastly, the relationship of the two variables tested. Results were discussed herein.

### Perceptions of Students on the Library Space Design

Table 1 shows the five indicators of library space design with an overall weighted mean of 4.25, with a quantitative description categorized as very high. This denotes that these students perceived that the Library Space Design is extremely manifested by their school in terms of lay-out and areas, aesthetics and atmosphere, noise management, collection availability and accessibility, and technology integration.

Among the five indicators, atmosphere and aesthetics is most highly manifested by students given a mean rating of 4.41 with a quantitative description of very high. This indicates that the aesthetic and atmosphere is extremely manifested in terms of color schemes, library appear visibly clean, overall ambiance of the library, comfortable and conducive for studying, temperature control.

**Table 1. Summary of Students' Perception as to the Level of Library Space Design**

Indicator	Mean Score	Descriptive Rating	Interpretation
Lay-out and Areas	4.32	Very High	This indicates that the lay-out and areas is extremely manifested in terms of individual areas, placement of various zones, both quiet spaces and collaborative areas, library signage, area/space for relocation.
Aesthetics and atmosphere	4.41	Very High	This indicates that the aesthetic and atmosphere is extremely manifested in terms of color schemes, library appear visibly clean, overall ambiance of the library, comfortable and conducive for studying, temperature control.
Noise management	4.18	High	This indicates that the noise management is highly manifested in terms of adequately minimize sounds external prevent noise leakage, suitable range of noise, noise level policies of the library are clearly posted.
Collection availability and accessibility	4.31	Very High	This indicates that the collection availability and accessibility is extremely manifested in terms of appropriate formats, locate them easily, current and up-to-date, resources convenient, checking them out exists readily.
Technology integration	4.05	High	This indicates that the technology integration is highly manifested in terms of Sufficient Electrical outlets exist, high-speed Wi-Fi, Printers, computers, and other academic tech tools, website provides seamless access, technical support for library technology/equipment.
Overall	4.25	Very High	The Library Space Design is extremely manifested by their school in terms of lay-out and areas, aesthetics and atmosphere, noise management, collection availability and accessibility, and technology integration.

Legend: 4.20-.5.00 = Very High; 3.40-4.19 = High; 2.60-3.39 = Moderate; 1.80-2.59 = Low; 1.00-1.79 = Very Low

On the other hand, technology integration has the lowest mean rating of 4.05, with a quantitative description of high. This indicates that the technology integration is highly manifested in terms of sufficient electrical outlets exist, high-speed Wi-Fi, Printers, computers, and other academic tech tools, website provides seamless access, technical support for library technology/equipment.

### Level of Library User Engagement

Table 2 shows the results of the library user engagement with the overall mean of 3.80 with a quantitative description as high. This indicates that the level of user engagement is high by the respondents in terms of library visits, resource utilization, facilities utilization, and library program participation.

Results also show that among the four indicators related to user engagement, the number of visits got the highest mean rating of 4.27 with a quantitative description of very high. This indicates that the library visit is extremely manifested in terms of regularly visit the physical library, environment motivates them to study, usual spots for individual or group, prefer to go to the library every time, group study and works in our class-related activities. This indicator of user engagement is supported by several studies that highlighted the importance of creating conducive and inviting library spaces to encourage frequent visits and library use.

**Table 2. Level of Library User Engagement**

Indicator	Mean Score	Descriptive Rating	Interpretation
Library of Visits	4.27	Very High	This indicates that the library visit is extremely manifested in terms of regularly visit the physical library, environment motivates me to study, usual spots for individual or group, prefer to go to the library every time, group study and works in our class-related activities.
Resources utilization	3.86	High	This indicates that the resource utilization is highly manifested in terms of check out printed books, periodicals, utilize materials like academic journals sourced, virtual resources provided, sufficient print and non-print resources, relevant resources for my needs.
Facilities Utilization	3.48	High	This indicates that the facilities utilization is highly manifested in terms of borrowed technology equipment, discussion/collaboration rooms for meetings, use audio visual materials and other equipment.
Library Program Participation	3.59	High	This indicates that the library program participation is highly manifested in terms of attend orientations, workshops, stay updated on offerings, provide input on surveys or user experience tests, actively participated the NBW, fully aware of the various programs and

services.

Overall	3.80	High	The level of user engagement is high by the respondents in terms of library visits, resource utilization, facilities utilization, and library program participation.
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Legend: 4.20-5.00 = Very High; 3.40-4.19 = High; 2.60-3.39 = Moderate; 1.80-2.59 = Low; 1.00-1.79 = Very Low

Moreover, the facilities utilization got the lowest mean rating of 3.48 with a quantitative description of user engagement as highly manifested by the students given an overall weighted mean of high. These results indicate that the facilities utilization is highly manifested in terms of borrowed technology equipment, discussion/collaboration rooms for meetings, use audio visual materials and other equipment. Respondents in this study were not that highly involved of themselves in terms of borrowing technology equipment. Furthermore, the sufficiency of library materials is not that favorably high.

### Relationship between library space design and user engagement of college students

One of the aims of this study was to determine if there was a significant relationship between library space design and user engagement among college students. In order to provide an answer to the problem, data were gathered and processed using Pearson Product Moment Correlation test. Results in Table 3 revealed that the significance (probability) value at 2-tailed is equal to .000 which is computed to be lower than the .05 level of significance set for this study.

Table 3. Relationship Between Library Space Design and User Engagement

Significance (Probability) Value	Pearson (r) Value	Interpretation	Decision
.000	.448	Significant	Reject the null hypothesis

### The Influence of Library Space Design Towards User Engagement

Table 4 shows that when regression equation  $UE \text{ (User Engagement)} = \beta_0 + \beta_1 \text{LSD (Library space Design)} + \epsilon_1$  was tested using simple linear regression analysis.

Table 4. Summary of Coefficients as to the Influence of Library Space Design and User Engagement

	Unstandardized Coefficients		Standardized Coefficients		
	B	Std. Error	Beta	T	Sig
(Constant)	1.373	.495		2.731	.007
Library Space Design	.575	.116	.448	4.967	.000

Sig. = .000; Adjusted r Square = .193; Df = 98

Results from the ANOVA show that the sig-value is .000 which is found to be below the .05 level of significance set for this study. This implies that overall, the model is considered to be significant and that the model fits the data.

When looking at the regression coefficient of Library Space Design (LSD), the estimated regression model can be mathematically presented as:

$$UE = 1.353 \text{ (constant)} + .575 \text{ (LSD)} + \epsilon_i$$

The value of the beta coefficient for LSD implies that holding all other variables in the regression constant, its coefficient indicates that for every 1 unit change in the level of respondents' perception towards LSD would give a corresponding .575 unit increase in the level of their library user engagement. This implies that positive perception towards LSD would cause an increase in the level of user engagement. That is, as the respondents level of perception towards library space design increases, the level of their engagement towards the library would also increase. The high positive beta coefficient with p-value of .000 for LSD confirms the empirical findings which claimed that LSD can significantly predict UE.

## Discussion

Investigating the students' perception on the Level of Library Space Design, the results on the level of library users' engagement, and lastly, the relationship of the two variables tested. The results of the study could increase their awareness vis-à-vis these variables.

### Perceptions of Students on the Library Space Design

The results above confirmed to the findings of Handa (2021) that suggests how the looks in the library send a message about the experience people would have as a whole. The study highlighted how the visual appeal and ambiance of libraries can shape the overall

user experience. Similarly, Zhao et al. (2019) also suggested in their findings that elements like natural lighting, comfortable seating, and pleasing aesthetics contribute to creating an inviting atmosphere conducive for learning and studying. In addition, the findings of this research confirm Isaac's (2019) statement that academic libraries consider those things in libraries that make the indoor and outdoor environments more beautiful and appealing.

This result confirms Lushington and Tennant's (2019) findings that emphasized the need for integrating user-centered design principles when incorporating technology in library spaces. They suggest that actively seeking student feedback and aligning technology provisions with their needs could improve perceptions and engagement. The relatively lower rating for technology integration in this study could indicate an opportunity to better understand and address students' specific technology requirements and preferences.

Similarly, Zhao et al. (2019) found that while students value elements like natural lighting, comfortable seating, and pleasing aesthetics in library spaces, they also expect seamless integration of technology to support their learning and research activities. Pun and Khoo (2021) explored the impact of technology integration in academic libraries and found that while students generally appreciate the availability of technology resources, they often encounter challenges related to outdated equipment, limited access to specialized software, or inadequate technical support. These factors can hinder the effective utilization of technology resources and contribute to lower perceptions of technology integration within the library space. Furthermore, a study by Siddike et al. (2021) revealed that students' expectations for technology integration in academic libraries continue to evolve rapidly, driven by advancements in digital technologies and changing learning preferences. The authors suggest that libraries must continuously adapt and invest in technology infrastructure, digital resources, and staff training to remain relevant and meet the evolving needs of tech-savvy students.

While the results of this study indicate a high level of manifestation for technology integration, the relatively lower rating compared to other indicators aligns with the literature's emphasis on the importance of continuous improvement, user-centered design, and addressing evolving technology needs to enhance student engagement and satisfaction with library spaces.

Moreover, the overall findings of library space design received a very high weighted mean of 4.25 which suggests that the participating schools in Regions XI and XII have made concerted efforts to create library spaces that cater to diverse student needs and preferences. Despite potential variations or conflicting ideas regarding the specific implementation of different aspects, such as layout, aesthetics, noise management, collection availability, and technology integration, the respondents collectively perceived their respective school libraries as highly conducive learning environments.

This positive perception aligns with the recommendations of several studies that emphasize the importance of designing library spaces that accommodate a wide range of activities and learning styles. For instance, Lushington and Tennant (2019) advocated for the integration of versatile spaces within libraries, enabling them to support various user preferences and activities, thereby fostering greater engagement. Similarly, Bennett (2021) explored the impact of flexible library spaces and found that libraries with movable furniture and reconfigurable partitions experienced higher levels of user engagement. Students appreciated the ability to customize the space to suit their individual or group needs, whether for quiet study, collaborative work, or other academic pursuits. This flexibility in design likely contributed to the very high overall rating for library space design observed in this study.

### ***Level of Library User Engagement***

The findings aligned with Merga's (2021) perspective that emphasized school libraries as being considered valuable safe spaces for users, serving as supportive environments for both quiet study and social interaction. Furthermore, Shadi (2023) noted that school libraries can function as collaborative learning hubs, facilitating group projects, discussions, and project-based learning activities. The high number of visits reported by respondents could be attributed to the library's role in accommodating collaborative learning experiences, in addition to individual study sessions.

Moreover, Wan et al. (2018) discussed the importance of designing libraries to enhance user experiences and create a sense of attachment. When users perceive the library space as inviting, comfortable, and tailored to their needs, they are more likely to develop a positive attitude toward the space, leading to increased visitation and engagement. Supporting this notion, the Person-Environment Fit Theory (Caplan, 1987) supported that environments that recognize and accommodate diverse needs and preferences contribute to a positive fit for individuals, enhancing their engagement and overall experience. The very high rating for library visits could be an indication that the respondents perceive a positive fit between their academic libraries and their study and learning requirements, and motivated them to frequently utilize the space regularly.

Moreover, the facilities utilization got the lowest mean rating of 3.48 with a quantitative description of user engagement as highly manifested by the students given an overall weighted mean of high. These results indicate that the facilities utilization is highly manifested in terms of borrowed technology equipment, discussion/collaboration rooms for meetings, use audio visual materials and other equipment. Respondents in this study were not that highly involved of themselves in terms of borrowing technology equipment. Furthermore, the sufficiency of library materials is not that favorably high.

The findings agreed with the study of Wan et al. (2018), which discussed the importance of designing libraries to enhance user experiences and create a sense of attachment. When users do not feel a strong connection or familiarity with the available facilities, such as collaborative spaces, equipment borrowing services, or specialized resources, they may be less inclined to fully utilize these

offerings, contributing to the relatively lower rating observed in this study.

Furthermore, Goel and Morvis (2021) proposed transforming libraries into versatile learning hubs that cater to various activities and learning styles. The lower rating for facilities utilization could indicate that some library facilities may not be effectively meeting the diverse needs and preferences of the student population, hindering their full engagement and utilization.

Additionally, a study by Siddike et al. (2021) revealed those students' expectations for library resources and facilities continue to evolve rapidly, driven by advancements in digital technologies and changing learning preferences. The lower rating for facilities utilization may reflect a need for academic libraries to continuously adapt and invest in up-to-date resources, equipment, and specialized facilities to remain relevant and meet the evolving needs of tech-savvy students. It is important to note that while facilities utilization received the lowest rating among the indicators of user engagement, the overall rating was still within the high range. This suggests that while there is room for improvement, students are still actively utilizing the available facilities to some extent. By addressing potential barriers, such as lack of awareness, misalignment with user preferences, or outdated resources, academic libraries can further enhance the utilization of their facilities and foster even higher levels of user engagement.

User engagement is a crucial aspect of academic libraries as it reflects the extent to which users actively interact with and utilize the available resources, facilities, and services. The finding that the overall user engagement received a very high weighted mean of 3.80 suggests a positive perception of academic libraries among respondents in Regions XI and XII. This level of engagement can be attributed to various factors highlighted in recent literature.

Library visits are often considered a measure of user engagement, and the quality of facilities and resources plays a significant role in attracting users to the physical library space. Sukram et al. (2018) emphasized the importance of providing welcoming and comfortable environments, as well as relevant collections and services, to encourage frequent library visits. Similarly, Sotak (2017) found that convenient library hours, accessibility, and well-designed spaces contribute to increased visitation. Resource utilization, including the use of books, journals, databases, and other materials, is another key aspect of user engagement. Effective promotion and user education on resource access and usage can significantly increase awareness and encourage users to take advantage of the available resources (Albarillo, 2020).

Additionally, ensuring that the resources align with users' needs and are regularly updated is crucial for fostering engagement (Zha et al., 2016). Facilities utilization, such as the use of study spaces, computer labs, and collaborative areas, is another indicator of user engagement. Providing flexible and well-equipped spaces that cater to different learning styles and preferences can enhance the user experience and encourage greater utilization (Oliveira, 2016; Waff & Potter, 2020). Program participation, which includes attendance at workshops, seminars, and events, demonstrates users' engagement with the library's services and initiatives.

### ***Relationship between library space design and user engagement of college students***

This finding implied that respondents' perception towards library space design as measured in terms of lay-out and areas, aesthetics and atmosphere, noise management, resource collection availability and accessibility, and technology integration is significantly correlated to the level of their users' engagement as measured in terms of number of visits, resource utilization, facilities utilization, and library program participation. The result on the Pearson (r) which is equal to .448 further affirmed the existence of such relationship and that the magnitude of the relationship was interpreted to be at low positive correlation. Both results indicated that both variables being studied tend to move in the same direction. That is, as the respondents' level of perception towards the library space design increases, there is a low positive probability that the level of their user engagement towards the library would also increase. Thus, the finding led the study to reject the null hypothesis.

The results in the table above conformed to the study of Goel and Morvis (2021) which states that libraries transform into being spaces that offers varied learning hubs. Also, the study of Lushington and Tennant (2019) agreed to the findings that the integration of collaborative spaces has also emerged as a significant trend in library design. Collaborative spaces encourage interaction which can promotes a sense of community and enhance user engagement. These spaces may include group study rooms, lounge areas, and dedicated project spaces that facilitate collaborative work and meaningful conversation.

### ***The Influence of Library Space Design Towards User Engagement***

In its entirety, however, the explanatory and predictive power of LSD is considered to be low because it could only account for 19.30 percent of the variation in the UE. This is manifested in the model summary table which shows that the value of the Adjusted R<sup>2</sup> is .193 which implies that about 19.30 percent of the variations in the UE can be explained by the variations in the LSD. The remaining 80.70 percent unexplained variation could be accounted for by other variables not included in the model.

The results of this study confirmed to the existing literatures including Lushington and Tennant (2019) which suggested that offering versatile spaces, libraries can accommodate a wide range of user preferences and activities and would further foster user engagement. In addition, the study of Bennett (2021) corresponded with the findings of this study that explored the impact of flexible library spaces on user engagement. Bennett (2021) findings revealed that libraries with furniture and partitions that could be easily moved and rearranged saw higher levels of engagement from their users. Users appreciated the ability to customize the space to suit their needs, whether for individual study, group work, or other activities. This flexibility made users more inclined to visit the library more often



and stick around longer, ultimately leading them to make greater use of the library's resources and services.

The Person-Environment Fit Theory, as applied in the context of this study and specifically to Caplan (1987), states that a school that recognizes and accommodates diverse learning styles, provides appropriate resources and facilities, and fosters a supportive social environment will contribute to a positive fit for its students, just as it would in a library. Since they feel more at ease and supported in their learning environment, students' engagement with academic tasks is likely to increase as a result of this positive fit.

## Conclusion

There are a number of important factors to think about while planning a library's layout in order to increase patron participation. Adaptable, Versatile Spaces housing contemporary libraries are increasingly transitioning from being merely storage facilities for tangible resources. Rather, they put their energy into making multipurpose venues that people can assemble in, engage with one another, and acquire new skills in. Coffee shops, digital art studios, and gathering places for people of all ages might all fall into this category. Involvement of the Community, Designers work in tandem with library employees and members of the community to develop user-friendly and functional environments. The library will be able to serve its varied patrons better if the community is involved in its planning from the start. Libraries are increasingly designing with outdoor areas in mind. These spaces improve the overall patron experience and provide up new avenues for interaction. The importance of open areas has been highlighted by the pandemic. Design and Furnishings of libraries are eschewing hefty, square furnishings. Instead, they choose for nimble furnishings that can be simply reconfigured to support varied uses of the space. Patrons are encouraged to explore different areas and creativity is fostered through this technique. A library is no longer just a place to store books; it is also a dynamic centre for community engagement, learning, and collaboration.

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