

RETHINKING 21ST-CENTURY PHILIPPINE LIBRARIES: A TRIANGULATION STUDY

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Abstract— The study investigated the evolving role of libraries in the 21st century, with a specific focus on Philippine libraries adapting to patron needs. Employing a triangulation approach that utilized seating sweeps, participant-driven photo elicitation, and a systematic literature review, the research delved into identifying patron preferences, spatial utilization, and design considerations. Key findings indicated a substantial shift in library dynamics, highlighting the importance of individual study areas for privacy and reading areas as vital social spaces. The results underscore the urgent need for libraries to evolve from traditional reading spaces to multifunctional spaces that promote learning, collaboration, and community engagement. Furthermore, the research identified a critical demand for collaborative zones, enhanced digital access, and designated spaces for multidisciplinary activities. By establishing actionable design considerations, this study aims to empower architects, planners, and policymakers to develop libraries that align with patron needs, establishing the significance of libraries in the 21st century.

Keywords— Seating sweeps, photo-elicitation, literature review, library design considerations, patron preferences

I. INTRODUCTION

Libraries have evolved significantly in the 21st-Century, transitioning from traditional book storage facilities to multifunctional learning areas, driven by the need to adapt to the growing population of digital users and the decline in conventional reading habits, reshaping them into future-oriented institutions (Demirli, 2017; Handa, 2021; Kumar, 2018; Melgoza et al., 2020). However, studies have found that changes in digital usage do not inherently influence library visits (Domiguez, 2016; Teleha et al., 2017).

Many libraries in the Philippines face challenges such as inadequate collections, outdated facilities, poor lighting, and ineffective temperature control, which hinder their ability to meet user needs and the Standards for Philippine Libraries,

resulting in underutilized spaces and decreased operational effectiveness (National Library of the Philippines, 2023; Ortego, 2016; Hillman et al., 2017; Estrullo-Suega et al., 2023). The 2022 Programme for International Student Assessment (PISA) indicates that the Philippines ranks among the bottom 10 in reading comprehension, underscoring the urgent need for educational improvements (PISA 2022 Results, 2023). Thus, libraries need localized research to engage with their communities and adapt their spaces beyond traditional patron groups (Ontanco, 2016; Li, L., 2023).

Mawardah et al. (2021) highlight that libraries must accommodate diverse preferences since patrons choose spaces depending on their goals and activities. Therefore, investigating patrons' activities and time spent in these locations can provide crucial insights for optimizing library functionality (Dees, 2019). Oslo Metropolitan University initiatives illustrate the need to rethink library spaces to fulfill patron needs amid rising demand for study areas (Gregersen & Moxnes, 2019).

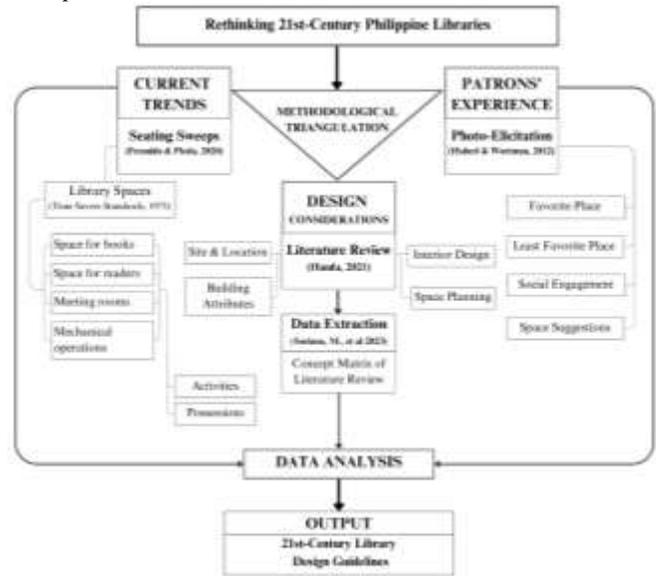
The Time Saver Standards for Building Types (1983) has been a constant reference for the architectural design of libraries. However, according to Obille (2007), the standards established previously are not attuned to 21st-century patrons' needs, emphasizing the need to improve these spaces further.

To improve the library experience in an evolving learning setting, libraries must assess their current functions and services (Chiscano, 2021). However, relying solely on one method may distort the researcher's understanding of the investigation (Gorissen et al., 2013). Due to this, methodological triangulation was needed to examine various patron views. Methodological triangulation utilizes multiple methodologies to provide a comprehensive result and explanation (Mostafavi, 2021). Triangulating data from diverse methods allowed researchers to interpret the research problems and determine the convergence and divergence between the results.

The study addressed the existing knowledge gaps on patrons' spatial preferences and library usage to establish design considerations for a 21st-century Philippine Library. Existing research frequently highlighted the necessity of digital resources in library environments while neglecting the improvement of physical spaces and evaluating their impact on patrons and their behaviors, which hinders the development of libraries beyond digital resources to meet patron needs and enhance functionality.

The study was guided by the research questions: ¹What are the current trends in the different library spaces, namely, space for books, space for readers, space for staff, meeting rooms, and mechanical operations based on possessions and activities? ²What specific patron-centric facilities are needed in a 21st-century Philippine library? ³What are the essential design considerations for a 21st-century library in the Philippines?

Figure 1
Conceptual Framework



A conceptual framework was derived from the questions to illustrate the study process, integrating current trends and patrons' experiences to establish design considerations. To gain insights into library usage and preferences, it used a triangulation process that includes observational methods such as seating sweeps (Fresnido & Pieda, 2020), which investigated the Time Saver Standards' library spaces, as well as qualitative techniques such as photo-elicitation (Haberl & Wortman, 2012). Key components include a literature study to ground findings from existing research (Handa, 2021) with an emphasis on site, location, building attributes, design, and space planning. Data extraction was utilized through a conceptual matrix. A methodological triangulation was used to increase the validity of the results. Ultimately, the study aimed to establish considerations that enhance library design, making spaces more responsive to patron needs and fostering engagement. Design considerations vary from design standards, which are mandatory obligations applied in a project, whereas considerations will only provide a list of subjects and examples for a design (Spokane Municipal Code, 2020).

The study is essential for rethinking patrons' spatial preferences, needs, and design considerations in 21st-century Philippine libraries to establish functional spaces. The study results serve as a guideline for architects, planners, and policymakers in addressing the improvement of a traditional library into a 21st-century library. Furthermore, in recognizing the transformative potential of rethinking 21st-century Philippine libraries, the study aligned with the Sustainable Development Goals (SDGs) of the United Nations, particularly corresponding to Goal 4, aimed to ensure inclusive and equitable education and promote lifelong learning opportunities, since thoughtful library design ultimately contributes to fair education for all. Accordingly, it is aligned with Goal 11, making cities inclusive and sustainable, as

libraries serve as hubs for social cohesion and engagement. Goal 16 promotes peaceful and inclusive institutions by ensuring access to reliable information.

II. METHODS

The research applied a triangulation method utilizing seating sweeps, photo elicitation, and a systematic literature review. The study analyzed five different library institutions, encompassing all tools and methodologies. The libraries were chosen based on location, physical facilities, services, population, and geographical proximity (May & Black, 2010). Two typologies of libraries were utilized and coded: Public and Academic libraries. The libraries are coded for confidentiality, as was utilized in the study of May and Black in 2010. Public libraries consist of a national library coded as P1, a city library coded as P2, and a provincial library coded as P3. In contrast, the study also used an academic library in the city coded as A1 and an academic library in the province coded as A2.

Seating Sweeps

The seating sweeps served as an observational tool to assess patron activities and possessions across various library institutions, following the methodology of Fresnido and Piedad (2020). This came with a checklist focused on current trends in library spaces, activities, and possessions of patrons. Library floor plans were also collected to analyze patron behavior further. The sweeps adhered to the schedule outlined by Shepherd et al. (2019) and Mandel (2016), which took place every Thursday for two hours, twice a day, based on the researcher's availability by also observing ethical considerations to minimize disruption.

Participant-Driven Photo Elicitation (PDPE)

The photo-elicitation was conducted with 25 participants from diverse groups (Chodock, 2021). Patrons were instructed that cellphones were necessary to take four (4) photographs of the following: ¹most favorite place, ²least favorite place, ³a place for socialization, and ⁴an inspiring place (Haberl & Wortman, 2012). Each place represented different experiential categories encompassing the feeling of comfort, support, home, and their favorite places, guiding the interview structure (Chodock, 2021). After which, a 7–30 minute semi-structured interview was conducted. A minimum incentive of 100 pesos was given to the participants at the end (Bedi & Webb, 2017; Neurohr & Bailey, 2016).

Systematic Review of Literature (SLR)

The study focused on literature published between 2014 and 2024 to ensure timely data relevant to the study. It was found on Google Scholar, Elsevier, LISTA, and Scopus (Khalid et al., 2021). A total of 40 research and case studies with IMRaD formulation were studied to find essential design considerations for a 21st-century library that was analyzed using review and synthesis (Gray & Burel, 2018). The systematic literature review phase was used; the planning, execution, and reporting of the different studies were shown

using a table (De Leon et al., 2021). The findings were tabulated per category (Khalid et al., 2021) and identified design considerations in the literature related to spatial literacy in library space studies (Gray & Burel, 2018). The categories included the study from Handa (2021), which integrated four categories: ¹Site and Location, ²Building Attributes, ³Library Interior Design, and ⁴Library Space Planning.

III. FINDINGS AND DISCUSSION

Findings from the seating sweeps, participant-driven photo elicitation, and literature review were discussed individually, followed by a triangulation analysis of convergences and divergences to cross-check its validity.

Current Trends in Possessions and Activities

The Seating Sweeps provided data to determine current trends in the different libraries across the Philippines based on observed possessions and activities.

Table 1
Current Trends on Possessions

Possessions	Frequency
Cellphone	30.69%
Writing material	15.49%
Water bottle/Tumbler	8.54%
Laptop	7.94%
Food/Drink	5.28%

During the seating sweeps, the top 5 out of 29 possessions were noted (refer to Table 1). The most-ranked possession recorded was cellphones (30.69%). Due to this, everyone carries it for academic and entertainment. McGinnis and Kinder (2020) stated that most patrons seek easy access to Wi-Fi and charging ports for personal devices. Writing material ranked second (15.49%), indicating continued use for traditional writing. Water bottle/tumbler ranked third (8.54%), revealing the importance of hydration as noted by Sandblom & Nilsson (2018). Laptop ranked fourth (7.94%), suggesting a preference for personal devices despite the availability of library computers, emphasizing the need for furniture with charging ports (Massachusetts Board of Library Commissioners & Sasaki, 2020). Lastly, food/drink ranked fifth (5.28%), with some sneaking in food due to varying policies on eating inside the library.

Table 2
Current Trends on Activities

Activities	Frequency
Using cellphones	17.45%
Talking	12.54%
Writing	9.68%
Using own laptop	8.61%
Sleeping	5.99%

Table 2 presents the top 5 dominant activities among 2,138 patrons from 34 activities. The most dominant was "using cellphones" (17.45%), reflecting their role in communication and online learning, aligning with Fresnido and Piedad (2020).

Talking ranked second (12.54%), as patrons visit libraries not only to utilize the traditional library service but also for social interaction (Laluna, 2019). Writing ranked third (9.68%), supporting the finding that writing material was among the highest possessions. The usage of personal laptops ranked fourth (8.61%), as patrons opted for them over library computers. In contrast, Obiamalu (2020) emphasized the need for library equipment such as computers. Notably, in A2, patrons were seated in front of the computers but did not use them; instead, they were using the nearby outlets for their laptops because some Library Computers were slow and primarily accessible for Online Public Access Catalog (OPAC) use only. Lastly, sleeping ranked fifth (5.99%), showcasing a shift in library use expectations from traditional to a diverse use.

Patron-Centric Facilities

Participant-Driven Photo Elicitation (PDPE) provided contextual insights by analyzing interactions between patrons and their environment to identify patron-centric facilities in Philippine libraries, emphasizing patrons' favorite space, least favorite space, socializing area, and inspirational areas. Additionally, patrons' typical activities, activities they wish to do, and requests within the library were explored in order to gain an understanding of their needs and preferences for improving library design.

Table 3
Most Favorite Space

Spaces	Individual Study Area	Reading Area	Book Area
Frequency	28.00%	16.00%	12.00%
Sample Image			

Table 3 presents patrons' top 3 favorite spaces. Twenty-eight percent (28%) chose an individual study area as their favorite place due to the privacy, focus, and charging ports it provides. Sixteen percent (16%) of patrons preferred the reading area for its accessibility and flexible furniture used for both sleeping and group study. This aligns with Xie I. et al. (2022), highlighting patron preference on adaptable spaces. Twelve percent (12%) favored the book sections, noting that it motivates them to read.

Table 4
Least Favorite Space

Spaces	Reading Area	Children's Library	Outdoor Seating Area
Frequency	20.00%	8.00%	8.00%
Sample Image			

Table 4 shows patrons' least favorite spaces. The reading area was disfavored by 20% due to limited seating and distractions from high-traffic, underscoring the need for activity-based zones (Demirli, 2017). Eight percent (8%) disliked the children's library due to the noise, supporting Şanlı & Sirel (2022) on the need for visual and acoustical isolation. The outdoor seating area received an 8% response with patrons citing uncomfortable weather and safety conditions, aligning with the guidelines by the Massachusetts Board of Library Commissioners & Sasaki (2020) for improving outdoor space usability. Additionally, a lack of safety and persistent noise from vehicles passing often results in a loss of concentration on their tasks.

Table 5
Socializing Area

Spaces	Reading Area	Discussion Room	Lounge Area
Frequency	24.00%	20.00%	16.00%
Sample Image			

Table 5 exhibits patrons' top 3 socializing areas. The reading area was the most preferred space chosen by 24% due to reconfigurable tables and seats, which facilitate collaboration. This aligns with Watson (2017), emphasizing the need for interactive spaces. Twenty percent (20%) preferred the discussion room for its privacy while at the same time socializing. The lounge area, with 16%, was identified as the third most frequented space for comfort and brainstorming, though volume was a concern. One patron also suggested larger spaces for better functionality, collaboration, and discussion.

Table 6
Inspirational Area

Spaces	Collection Section	Historical Section	Children's Library	Discussion Room	Awards Display Section
Frequency	38.46%	19.23%	7.69%	7.69%	7.69%
Sample Image					

Table 6 presents patrons' top 3 inspirational areas. The collection section was the most inspiring place, chosen by 38.46% for its connection to the world and valuable thesis materials. The historical section followed at 19.23%, motivating patrons by cultural identities. Madzharov et al. (2018) noted that the smell of books produces a "slight vanilla scent" that enhances concentration and alertness. The children's library came in third with 7.69%, as it is crucial to foster learning, as emphasized by Yildiz (2023). Moreover, interviews indicate children's libraries inspire them to read, facilitating the healing of their inner child.

Table 7
Patrons' Typical Activities

Activities	Frequency
Relax	21.74%
Sleep	19.57%
Academic Works	17.39%

Table 7 displays the top 3 typical activities of patrons, with relaxation, sleep, and academic work the most frequent activity. Notably, 21.74% of patrons indicated relaxation, while 19.57% reported sleeping, demonstrating a shift in patrons' perception of the traditional library. Supported by the Massachusetts Board of Library Commissioners, & Sasaki (2020), providing a variety of seating enhances comfort and accessibility for diverse users and activities. Lastly, 17.39% of patrons engaged in academic work, validating the function of libraries as a learning hub.

Table 8
Patrons' Wish to Do

Activities	Frequency
Eat	28.57%
Speak Freely	25.00%
Charge Devices	7.14%
Sleep	7.14%

Table 8 shows the top 3 activities patrons wish to do in the library without restriction, and 28.57% indicated their

preference to "eat." In contrast, 25% stated a desire to "speak freely." Simultaneously, 7.14% wished to "charge devices" and "sleep" in the library. These activities highlight the changing role of the library as a more diverse space for less stringent policies inside the library. This was mentioned in the findings of the Massachusetts Board of Library Commissioners & Sasaki (2020), where it suggested that providing a type of seating that has access to outlets should be flexible for various activities.

Table 9
Patrons' Requests

Requests	Frequency
Discussion Area	30.77%
Library Café	12.82%
Children's Library	7.69%

Table 9 presents the top patrons' requests to enhance the library experience. 30.77% of patrons expressed a desire for a "discussion area" where users could speak freely. This was supported by Novrial, N., & Munthe, T. E. (2024), stating that the discussion area should be enclosed and apart from the other spaces to avoid any interruption. Additionally, 12.82% preferred a "library cafe" during library visits, which was also reinforced by John, G. (2016), stating that the library should have a cafe where patrons can casually converse and relax. Lastly, 7.69% indicated they wanted a "children's library," which evokes inclusivity.

Design Considerations for 21st-Century

The literature review offered data to recognize the essential design considerations for a 21st-Century library in the Philippines. Over 200 relevant literature, books, journals, and publications were analyzed. It includes Philippine Library Standards, such as the 2022 PAARL Standards for Academic Libraries, the Standards for Philippine Libraries (2011), and the Revised Standards for Philippine Public Libraries (2015). The literature was examined and corroborated to identify pertinent design considerations, and only 40 published works were deemed relevant to the study. The established design considerations were ranked and totaled based on their frequency of occurrence.

Table 10 shows that based on 22 literatures, tall glass-insulated windows for natural lighting were ranked highest. In contrast, 20 literatures mentioned not overusing glass windows, which ranked second, indicating that glass is essential but has limitations. The centrally located and "One-Stop-Shop" concept was mentioned 19 times, ranking third, stating that a library and its neighborhood should include amenities to support patron needs. The fourth ties three design considerations, each with 18 citations. The two considerations influence library technology use, requiring digital labs and computer areas with Wi-Fi. Another consideration for varied users was furniture and equipment that is flexible and

supported in #80, required futuristic design. The interviews revealed that libraries wish to renovate but lack funds and space for expansion.

Space Planning

Space planning covers the physical spaces within the library, and the following aspects were found to be a convergence. Five themes were elaborated for space for readers. First, #88, PDPE suggests quiet group spaces must be adjacent to individual study areas. Second, items #91 and #92 highlight the importance of individual spaces for privacy and increased focus. Third, #96 suggested a mix of open seating and private niches for diverse patron needs. Library A1 and A2 privacy concerns emphasized the need for distraction-free sleeping and study areas. #90, flexible space for group academic work and discussion, supports the Massachusetts Board of Library Commissioners & Sasaki (2020) need for adaptive library environments. The PDPE found that reading areas and discussion rooms are top needs, emphasizing the necessity for modular furniture that can be rearranged for different activities and group sizes.

Under “meeting spaces,” #113 spaces for community meetings, group, and individual study are utilized to engage in serious study or peer discussions, which was seating sweeps’ second highest activity and a patron’s wish in PDPE. The addition of lounge areas was also the 3rd highest in PDPE for socializing spaces. Moreover, another aspect, #116, stated that seating should accommodate various group sizes for instructional activities. The Ministry of Education, Youth, and Sports (2016) stated that libraries should provide seating space for instructional activities for small and large groups or even the whole class. Both prove the need for flexible furniture that can be adjusted accordingly.

For “inspiring spaces,” #119 makerspaces for collaborative DIY areas are suggested, showing that libraries are not just made for reading and writing, which was also supported by Choy & Goh (2016). The same was revealed in P1, where architecture and engineering patrons tend to use libraries for drawing. A staff interview in P3 revealed that patrons sometimes use floor areas between the bookshelves for arts and crafts since they are not limited in space. With this, furniture such as drafting tables was requested.

For “garden space,” #123 is a convergence, where outdoor spaces should be sheltered from wind, rain, and sun to enhance comfort and encourage use. In libraries A1 and P3, these spaces were least liked, due to discomfort, particularly caused by the Philippines’ extreme weather conditions of heat and heavy rain. Therefore, when selecting outdoor furniture (#126), factors such as comfort, durability, and weight are crucial. Additionally, #144 encompasses the need for auxiliary spaces, as libraries shall have spaces such as cafes, theaters, art galleries, media lounges, and studios, according to Lushington, N., et al. (2016). In Seating Sweeps, food and drink were patrons’ fifth most important possessions. The PDPE results

indicated that relaxing and sleeping were the top and second highest activity, with eating also being the most requested addition, emphasizing the desire for cafes. This aligns with the concept of “learning commons,” where spaces accommodate various activities such as eating, talking, discussing, and using mobile devices. In A1, a designated “learning commons” area on the second floor allowed patrons to engage freely in their desired activities.

There are 120 design considerations from the three methods that have undergone divergence. Triangulated themes ensure that patrons are considered in establishing 21st-century library considerations. For example, four significant design considerations from the Philippine setting underwent divergence. Starting at #72, it suggests that providing drafting tables in the library is essential since architecture students are forced to use regular tables for drafting works. In #135, it indicates that libraries may include a powder room and recreational room since patrons also visit the library for socialization. On the other hand, #136 states that having a napping area is vital since the library provides a quiet space for naps. Lastly, water bottle refilling station #138 is important since most patrons provide or carry their water bottles. These considerations underwent seating sweeps and PDPE and were not mentioned in literature reviews. These findings suggest that some considerations are found in seating sweeps and PDPE but not in literature reviews or vice versa, highlighting the importance of the triangulation method in cross-checking the validity of each consideration.

IV. CONCLUSION AND RECOMMENDATION

In conclusion, the three methods found 143 design considerations, 31 of which are in Philippine library design standards, and 112 are additional for planning and designing a 21st-century Philippine library. These findings show that the Philippines requires additional design considerations to further satisfy patrons’ library usage, space, and external factors demands. These standards help evaluate library performance, but they cannot be too prescriptive to be applied for all libraries. The conclusions of this study should guide architects, planners, and policymakers in designing 21st-century Philippine libraries. Finally, the triangulation method used in this paper may be applied to other 21st-century architectural typologies, including schools, offices, and public spaces.

REFERENCES

- Abouelela, A. (2022). Towards a Better Interior Design for the Academic Library at College of Education—King Faisal University. <https://www.mdpi.com/2411-9660/6/3/47>
- Anderson, E. (2018). Sustainability and the Modern Library. Retrieved from <https://go.ly/SO380>
- Andrews, C., et al. (2016). From “Library as Place” to “Library as Platform”: Redesigning the 21st Century Academic Library. *The Future of Library Space*, 145–167.

- Bedi, S., & Webb, J. (2017). Participant-driven photo-elicitation in library settings: A methodological discussion. *Library and Information Research*. <https://go.ly/Jz2wm>
- Bossaller, J., et al. (2020). A happy ambience: Incorporating ba and flow in library design. *The Journal of Academic Librarianship*, 46(5), 102228. <https://go.ly/xqayn>
- Cameron, R., & Sankaran, S. (2013). Mixed-methods research design: Well beyond the notion of triangulation. In *Novel approaches to organizational project management research* (Chapter 14). Retrieved from <https://bit.ly/4fXEhZT>
- Cha, S., & Kim, T. (2015). What Matters for Students' Use of Physical Library Space?. *The Journal of Academic Librarianship*. <http://dxdoi.org/10.1016/j.acalib.2015.03.014>
- Cheng, W., et al. Assessing the spatial accessibility and spatial equity of public libraries' physical locations. *Library and Information Science Research*, 43, 101089. <https://doi.org/10.1016/j.lisr.2021.101089>
- Chiscano, M. (2021). Giving a voice to students with disabilities to design library experiences: An ethnographic study. *Societies*, 11(61). <https://go.ly/8uOVj>
- Chodock, T. (2021). Mapping Sense of Belonging in Library Spaces. Retrieved from <https://go.ly/UcV36>
- Choy, F. & Goh, S. (2016). A framework for planning academic library spaces. *Library Management*, 37(1/2), 13–28.
- Dees, A. S. (2019). They Do It Here: A Case Study of How Public Space is Used in a Research Library. *The Southeastern Librarian*, 67(2), Article 4. DOI: 10.62915/0038-3686.1804
- De Chiara, J., & Callender, J. H. (1983). *Time Saver Standards For Building Types* (2nd Edition). McGraw-Hill Book Co., Singapore.
- De Leon, et al. (2021). Library space design framework: A conceptual analysis. *Asia Pacific Social Science Review*, 21, 241-248. Retrieved <https://bit.ly/3BXF0pS>
- Demirli, M. E. (2017). A systematic design approach for Bilkent library. *International Journal of Architecture*, 3(1), 27–35. <https://doi.org/10.6084/m9.figshare.4598267.v1>
- Dominguez, G. (2016). Beyond gate counts: seating studies and observations to assess library space usage. *New Library World*, 117(5/6), 321–328. <https://bit.ly/40iK1kX>
- Estrullo-Suaga, E. et al. (2023). Undervalued, understaffed, underdeveloped, and underutilized? The status of public libraries in the eleven municipalities of rural Iloilo Province, Philippines. *Information Development*, 39(3), 659-676. <https://go.ly/egNPD>
- Fairfax County Public Library. (2017). *Fairfax County Library Design Manual*. Fairfax County Public Works and Environmental Services Building Design and Construction Division. <https://bit.ly/4jifKeA>
- Fresnido & Pieda (2020). Mapping space utilization in an academic library. *Animo Repository*. https://animorepository.dlsu.edu.ph/faculty_research/9309
- Gatamu, K., & Maringa, P. (2024). The Interplay of User Needs and the Architectural Design and Form of Libraries. *Conference Paper*. Retrieved from <https://go.ly/J9J93>
- Given, L. M., & Archibald, H. (2015). Visual traffic sweeps (VTS): A research method for estrullomapping user activities in the library space. *Library & Information Science Research*, 37(2), 100–108. <https://doi.org/10.1016/j.lisr.2015.02.005>
- Gilton, D. (2016). *Creating and Promoting Lifelong Learning in Public Libraries*.
- Gisolfi, P. A. (2019). Trends in Public Library Design from the 19th to the 21st Centuries. *Public Library Quarterly*, 1–19. doi:10.1080/01616846.2019.1582268
- Gorissen, P., et al. (2013). Methodological triangulation of the students' use of recorded lectures. *Int. J. Learning Technology*, Vol. 8, No. 1, pp. 20–40.
- Gray, J., & Burel, M. (2018) *Applying spatial literacy to transform library space: a selected literature review*. DOI: 10.1108/RSR-02-2018-0023
- Gregersen, A. B., & Moxnes, G. B. (2017). Making the Library the Preferred Place to Study: Rethinking Existing Spaces and Opening the Library to the Users. *Proceedings of the IATUL Conferences*, Paper 2. Retrieved from <https://docs.lib.purdue.edu/iatul/2017/spaces/2>
- Gregersen, A.-B., & Moxnes, G. B. (2017). Making the library the preferred place to study: Rethinking existing spaces and opening the library to the users. Paper presented at the 38th IATUL Conference, Bolzano. Retrieved from <http://bit.ly/4hfkDDt>
- Gstalter, S. H. (2017). *Understanding library space planning* (Pub No. 10289537) [Doctoral dissertation, University of Pennsylvania]. ProQuest Dissertations and Theses Global.
- Guyer, J.P. (2018). *An introduction to Architectural design of Libraries*. https://www.google.com.ph/books/edition/An_Introduction_to_Architectural_Design/p0FJDwAAQBAJ?hl=en&gbpv=1&dq=design+guidelines+for+libraries&pg=PLibraryA18&printsec=frontcover
- Haberl, V., & Wortman, B. (2012). *Getting the picture: Interviews and photo*
- Handa, T. S. (2021). *Innovative Library Services through Aesthetic Library Design and Space Planning*. Indian Institute of Technology Ropar. <https://www.researchgate.net/publication/349052416>
- Hillman, C., et al. (2017). User-focused, User-led: Space Assessment to Transform a Small Academic Library. *Evidence-Based Library and Information Practice*, 12(4).
- John, G. (2016). *Public Library Facilities for the Future*. Margaret Sullivan Studio. Retrieved from <https://www.margaretsullivanllc.com/wp-content/uploads/2019/06/MSS-Public-Library-Facility-for-the-Future.pdf>

- Jaskowiak, M et al. (2019) "We're All in This Together: An Examination of Seating and Space Usage in a Renovated Academic Library". *Library Philosophy and Practice (e-journal)*.2645.<https://digitalcommons.unl.edu/libphilprac/2645>
- Khalid, A., & et al. (2021). *Sustainable development challenges in libraries: A systematic literature review (2000–2020)*. *The Journal of Academic Librarianship*, 47(3), 102347. DOI: 10.1016/j.acalib.2021.102347
- Kahn, M., & Underwood, P. G. (2018). Space planning in libraries: For students, by students. *Education for Information*, 1-12. DOI: 10.3233/EFI-180177.
- Kelle, U., et al. (2019). How to use mixed-methods and triangulation designs: An introduction to history education research. *History Education Research Journal*, 16(1), 5–23. <https://doi.org/10.18546/HERJ.16.1.02>
- Kumar, S. (2018). Sweeping the library: Mapping the social activity space of the public library. *Globus: An International Journal of Management & IT*, 9(2), 1-12.
- Laluna, J. (2018) Improving the Library Space of the Philippine School of Interior Design Using Design Charrette. ISSN 2423-2254, <https://ejournals.ph/article.php?id=18458>
- Latimer, K. (2018). 2050: A Library Space Odyssey. *Planning the Future Library. Legal Information Management*, 18, 203-209. <https://doi.org/10.1017/S1472669618000438>
- Lesneski, T. (2015). Transforming Mid 20th-Century Libraries to Meet 21st-Century Needs.
- Li, L. (2023). The future of academic libraries in the digital age. *Trends, Discovery, and People in the Digital Age*, 253-268. doi:10.1016/b978-1-84334-723-1.50016-4
- Lushington, N., et al. (2016). *Libraries: A Design Manual*. Berlin, Boston: Birkhäuser. <https://doi.org/10.1515/9783038216308>
- Madzharov, A., et al. (2018). The impact of co ee-like scent on expectations and performance. *Journal of Environmental Psychology*, 57, 83–86. <https://doi.org/10.1016/j.jenvp.2018.04.001>.
- Mandel, L. (2016). Visualizing the library as a place. *Performance Measurement and Metrics*, 17(2), 165–174. <https://doi.org/10.1108/pmm-04-2016-0016>
- Massachusetts Board of Library Commissioners, & Sasaki. (2020). *Library space: A planning resource for librarians*. Retrieved from <https://mblc.state.ma.us/libraryspace>
- Mawardah, S., et al. (2021). A study of the application of behavioral architecture in public libraries in Jakarta, Indonesia. *IOP Conference Series Earth and Environmental Science*, 794(1), 012161. <https://doi.org/10.1088/1755-1315/794/1/012161>
- May, F., & Black, F. (2010). The Life of the Space: Evidence from Nova Scotia Public Libraries. *Evidence Based Library and Information Practice*, 5(2), 5–34. <https://doi.org/10.18438/b8ms6j>
- McGinnis, R., & Kinder, L. (2020). The library as a liminal space: Finding a seat of one's own. *The Journal of Academic Librarianship*, 102263. doi:10.1016/j.acalib.2020.102263
- Melgoza, P. et al. (2020). Using Visual Ethnography for Space Studies Paper presented at 2020 ASEE Virtual Annual Conference Content Access, Virtual Online. 10.18260/1-2--35478
- Ministry of Education, Youth, & Sport. (2016). *21st Century Library Standards*. Kampuchea Action to Promote Education. <https://www.kapekh.org/files/reportfile/100en.pdf>
- Mondal, H. (2021) *Library Building: Planning, Principles, & Standards in the Perspective of 21st Century*. (n.d.). https://www.researchgate.net/publication/353211306_library_building_planning_principle_standards_in_the_perspective_of_21st_century
- Montgomery, S. E. (2014). Library Space Assessment: User learning behaviors in the library. *The Journal of Academic Librarianship*, 40(1), 70–75. <https://doi.org/10.1016/j.acalib.2013.11.003>
- Mostafavi, A. (2021). Architecture, biometrics, and virtual environments triangulation: a research review. *Architectural Science Review*, 65(6), 504–521. <https://doi.org/10.1080/00038628.2021.2008300>
- National Library of the Philippines. (2023). *Status report of Philippine public libraries and librarianship*. National Library of the Philippines.
- Neurohr, K., & Bailey, L. (2016). Using Photo-Elicitation with Native American Students to Explore Perceptions of the Physical Library. *Evidence Based Library and Information Practice*.
- Novrial, N. & Munthe, T. (2024). DESIGNING PUBLIC LIBRARY, IN MEDAN CITY WITH BIOPHILIC ARCHITECTURE. *Scientica: Jurnal Ilmiah Sains Dan Teknologi*, 2(12), 531–538. Retrieved from <https://go.ly/AWO4r>
- Obiamalu, A.R. & Echedom, A.U. (2021). Assessment of University Libraries in Southeast Nigeria based on LRCN Standards and Guidelines: A Focus on Buildings, Furniture, and Equipment. ISSN: 1522-0222
- O'Kelly, M., et al. (2017). Can a Library Building's Design Cue New Behaviors? A Case Study. *portal: Libraries and the Academy*, 17(4), 843-862. <https://doi.org/10.1353/pla.2017.0049>
- Ontanco, L. (2016). *Outreach Engagement Of Public And Academic Libraries In Pangasinan*
- Obille, K.L. (2007). An Evaluation Of Standards For Academic Libraries In The Philippines. *Journal of Philippine Librarianship*.
- Ortego, S.P. (2016). Status of libraries in the first and second legislative districts of Leyte. *Journal of Philippine Librarianship*, 36, 26–49.
- Otuonuyo, G. et al. (2024). Assessment of accessibility and inclusivity in the design of public library in Lagos. *International Journal of Multidisciplinary Research and Growth Evaluation*. 05. 594-599.
- PAARL ADHOC committee. (2021). *2022 PAARL Standards for Academic Libraries*. <https://paarl.org.ph/wp-content/uploads/2022/12/2022>
- PISA 2022 Results (Volume I). (2023, December 5). OECD. <https://go.ly/hy8Zy>

- Şanlı, S. N., & Sirel, A. (2022, May). The effects of developing information technologies on 21st century library architecture. In Proceedings of the International Conference of Contemporary Affairs in Architecture and Urbanism (Vol.5, No.1, pp.12-26).
- Shepherd, J., et al. (2019). Does size matter? In-library study of two Canadian public library branches. *Library Management*, 41(1), 1–13. <https://doi.org/10.1108/lm-08-2019-0058>
- Shook, S. (2018, August 27). Top 5 Library Design Trends. Retrieved from [www.demcointeriors.com](https://www.demcointeriors.com/blog/top-5-library-design-trends/): <https://www.demcointeriors.com/blog/top-5-library-design-trends/>
- Shrivastava, R., et al. (2018). Library Buildings: New Aspects of Library Design. *Journal of Advancements in Library Sciences*. 2018, 5(2): 75–79p.
- Soriano et al. (2023). Space Syntax Theory: Multigenerational Dwelling as a residential building typology in the Philippines. (*Unpublished*).
- Spina, C. (2021). *Creating Inclusive Libraries by Applying Universal Design: A Guide*. Lanham: Rowman & Littlefield. 187p. ISBN: 9781538139776.
- Spokane Municipal Code 17A.020.040.L (2020). <https://acesse.one/agBpe>
- Suwanntoro, H., & Hutaaruk, M. (2024). PUBLIC LIBRARY DESIGN WITH THE APPLICATION OF INCLUSIVE ARCHITECTURE IN TARUTUNG. *Scientica: Jurnal Ilmiah Sains Dan Teknologi*, 2(12), 435–447. Retrieved from <https://go.ly/KzjZh>
- Teleha, J. et al. (2017). Library space redesign and student computing. *Public & Access Services Quarterly*, 13(3), 139–151. <https://doi.org/10.1080/15228959.2017.1317613>
- Watson, L. (2017). Space in the academic library of the 21st century: Trends and ideas. <http://bid.ub.edu/en/38/watson.htm>
- Webb, K. (2018). Development of Creative Spaces in Academic Libraries. <http://tiny.cc/37y5001>
- Yıldırım, K. (2021). Library Building: Planning, Principle, and Standards in the perspective of the 21st century. ResearchGate. <https://www.researchgate.net/publication/353211306>
- Yildiz, A. K. (2023). Importance of children's libraries in the pandemic. *International Journal of Librarianship*, 8(1), 11–30. <https://doi.org/10.23974/ijol.2023.vol8.1.220>

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