

# Factors Influencing Academic Library Design in Universities: A Study of Post-Graduate Students of Gombe State University, Nigeria

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## Abstract

This study is aimed at investigating the factors influencing academic library design for sustainable educational growth and development, the study uses a questionnaire survey to document the responses of postgraduate students of Gombe State University on factors responsible for academic library design, the study uses descriptive and exploratory research design using quantitative approach. 150 questionnaires were distributed to postgraduate students in GSU, and 130 were screened and used for the analysis. Results revealed that user needs and preferences are the 1st factor in academic library design with a weighted mean and standard deviation of 4.3457 (0.7312), and technology integration is ranked 2nd with 4.1607 (0.59625). innovative design features ranked 3rd with a mean of 4.0357 (0.87312). Factors with low influence according to the results are energy efficiency, followed by collaboration and interaction, and finally space utilization. The study recommends that it is important for institutions to involve students, faculty, and other stakeholders in the design phase through methods such as surveys, focus groups, and gathering user feedback.

**Keywords:** Academic Library, Design, Post-Graduate Students, University, Sustainability.

## Introduction

A library is one of a university's most important physical attributes (Mulrooney & Kelly, 2021). The concept of modern academic libraries is changing to informal learning spaces that encourage active interactions and collaboration among users. The main users of the academic library, students, perform various activities in a library, including individual focus work, group projects, social gatherings, and relaxation (Lee & Schottenfeld, 2014). It is required to provide proper spaces and environments for each activity because appropriate environmental support can enhance the perceived performance of users (Kim et al., 2021). There is a paradigm shift in the design of libraries because modern technologies have been informing the teaching and learning experience and school administrators have been working with architects to design libraries that will support this evolution.

The library serves as a repository for valuable information, encompassing both printed and electronic formats. It is traditionally regarded as the primary location for documenting and

storing explicit knowledge, readily accessible to users to aid learning and teaching endeavors. Given its significance as a cornerstone of educational infrastructure, particularly evident in school libraries, its spatial design must remain adaptable to accommodate existing and emerging pedagogical approaches. Moreover, the layout of the library should be crafted to invigorate and motivate both learners and educators, fostering their growth and promoting innovation. The library needs to be dynamic, capable of fulfilling various purposes, and actively participate in information system committees to ensure its efficacy. (JISC, 2009).

Academic library is established in the university to satisfy the teaching, learning, and research needs of the academic community. The educational resources in print, audiovisual, and electronic formats and the good learning environment of the university library make it a place to achieve a learning experience. JISC (2009) emphasized that seeking input from key stakeholders regarding their visions for new spaces and their experiences with the shortcomings of the old ones is crucial. In a school context, these stakeholders include school boards, administrators, teachers, parents, and students. It is incumbent upon these individuals to ensure that the physical design of the space aligns with the institution's overarching strategic goals for teaching and learning.

The strategic vision should be articulated in every detail of the design and shared with all relevant parties, including the learners. Ghaziani (2008), states that school designs are usually made by "administrators, public officials, builders, architects and others who, in most cases, will not use the finished building". While children "are seldom able to influence the reality of school design" (Bland, Hughes, Willis, and Burns, 2013). Clark (2010) has shown that all students are capable of innovative ideas about learning environments. Also, Nayak and Bankapur (2016) emphasize that "School library physical environment places more focus on the learning that will take place in the space than on the resources or collections that are housed there." They also noted that the library space can be created to stimulate students to discover, collaborate, connect, create and share their knowledge. Previous literature has shown a lack of in-depth studies on factors influencing academic library design in universities. Therefore, this paper is going to address the gap by investigating factors influencing academic library design in Gombe State University, Nigeria.

### **Statement of the Problem**

Based on observations carried out in the university library, there is a very low patronage from postgraduate students in the university, this could be due to the academic library design. Design. The design of today's libraries is not welcoming due to the influence of technology and the availability of internet sources in and around the surrounding environment of learning and teaching. Therefore, redesigning school libraries should involve redesigning the interior of the existing library spaces and creating new adherence to the present culture. It is important to note that though libraries remain the heart source of wisdom and knowledge, the introduction of new technology and its application in

libraries has opened up new avenues for making history and its services (Abdussalami, 2023).

Many studies were carried out concerning the design of academic library spaces. The notable areas were conducive in the areas of academic digital library spaces and students' academic performance. Kim and Yang (2022) explored academic library spaces and student activities during covid-19 pandemic. Roberson, Barefield, and Griffith (2022) investigated students with disabilities and library services: blending accommodation and universal design. Ashiq, Jabeen and Mahmood (2022) investigated on Transformation of libraries during the COVID-19 pandemic: A systematic review. Kim, Bosch and Lee (2020) studied alone with others: understanding the physical environmental needs of students within an academic library setting. Min and Lee (2020) explored space-choice behavior for individual study in a digital reading room. Previous studies did not explore factors influencing academic library design for sustainable growth and development.

The research objective is to determine the factors influencing academic library design in the study area while the research question is what are the factors influencing academic library design at Gombe State University? Therefore, this study is going to bridge the identified gap by investigating academic library design in universities; a study of postgraduate students of Gombe State University, Nigeria.

### Literature Review

The Whole Building Design Guide (WBDG, 2017) posits that planners and designers define space in response to anticipated user patterns, identifying the physical characteristics of the space and the specific value it will add to the educational mission of the institution as a whole". Libraries are also designed to facilitate the social development of students because the library is a place where students meet in ways that are different from meeting in classrooms and out-of-school locations. When a student meets in the library, "the student becomes part of a larger community a community that endows one with a greater sense of self and higher purpose while students are intensely engaged in using modern technologies, they also want to enjoy the library as a contemplative oasis" (Freeman, 2005).

Library design has always been an important consideration for universities, and more recently, libraries have become part of the statement architecture that helps generate interest in choosing to study at a university. The learning space can be characterized by its physical features and the perceived quality of social and functional features of the environment (Beckers *et al.*, 2016). The alignment of physical and functional environments with students' activities consequently supports students' performance and well-being (Kim *et al.*, 2021). Research has shown that learning can be influenced by the physical environment where students perform their tasks (Tanner, 2000), and students prefer spaces that can support their learning activities (Beckers *et al.*, 2016).

Academic libraries must provide appropriate spaces for learning, socializing, and relaxing activities. An open-plan space setting, which is actively applied to academic libraries to support collaboration among users, raises several issues in functional environments. In

addition to spaces that encourage collaboration, students need quiet, individual study areas offering privacy in libraries (Ellison, 2016). Both undergraduate- and graduate-level students reported that space for quiet study is more important than group study and work (Association of Research Libraries, 2019). Academic libraries will need to reconfigure not just their services and delivery model but also their resource base. In short, academic libraries will need to acquire dynamic capabilities if they are to meet the futuristic needs of their patrons.

The design of a library's space according to the five design elements purported by Nelson and McConachie (2008), is essential for students' holistic development. These design elements were used as a benchmark to measure and discuss the design of the library under study. The five design elements are as follows: Design element (i) highlights that the space for teaching, learning, and production of knowledge is more important than storage space. This means that when designing a school library, the teaching and learning goals must take precedence. This is critical as these goals drive the criteria for evaluating the space devoted to books, media technology, networked content, offices, and formal and informal teaching areas. This consideration is important because high school students need space other than the generic classroom to read, view, write, talk, and produce evidence of their learning. A centralized library is an ideal workspace for the above to happen (Nelson & McConachie, 2008). Design element (ii) specifies that the library must support multiple ways of teaching and learning. Therefore, users of the library should have the flexibility to do individual or group work, with network resources or assistance from the teacher-librarian as well. In addition, these elements advocate for flexible and adaptable library space to support different learning styles.

These are spaces that can be quickly rearranged to accommodate the different uses for which the students need to use the library from one hour to the other or from one day to another. This calls for flexible furniture and adaptable library spaces that can be economically re-modeled. Design element (iii) suggests that the collection development policy should influence library space needs. The goal of having resources on a wide variety of subjects is no longer necessary because of the ubiquitous web-based content. This design element is related to design element (iv) which states that content and services increasingly reside at the network level. The quality of the library's electronic infrastructure (air-conditioning Wi-Fi, etc.) is of the highest priority. If the library has the right licenses to electronic databases the school library can provide access to far more content than the library can purchase and store (Nelson & McConachie, 2008). Design element (iv) prescribes that the intellectual content and services of the library are increasingly delivered through a library's networked infrastructure rather than as physical media stored within the library. The quality of the library's electronic infrastructure (AC, data, wireless) should therefore be of the highest priority.

Design element (v) states that the library must be grand, beautiful, and inspiring with ample unencumbered floor area, generous spatial volume, and abundant natural light. It is argued that the library's location, size, technology infrastructure, and aesthetic quality attract

students to the school's signature academic space. Nelson and McConachie (2008) also emphasize that all adolescents deserve school library space which is out of the ordinary and that an inspiring library space elevates the importance of academic work.

**Methodology**

This section gives a clear understanding of the data collected and the technique adopted to achieve the result. It clarifies the procedures and techniques adopted in collecting and analyzing data for the study. The research design used was descriptive and exploratory research design. A quantitative research approach was employed since the data set is measurable. Furthermore, for this research, the population is postgraduate students. A questionnaire was designed which was used as an instrument for collecting data. Questionnaires were administered after restructuring the questions to suit the objective of the study., the sample frame of the study is 200 accessible respondents (postgraduate students) from Gombe State University. The number of questionnaires distributed to the respondents was based on the sample size determined in the Kreijcie & Morgan table (1970). According to the table, 132 questionnaires are considered as the sample size. The questionnaire was administered and retrieved in one week as in Chacón (2009). 150 questionnaires were administered to postgraduate students at various faculties during their lecture time at Gombe State University. A higher number recommended by Krejcie and Morgan (1970) was distributed, this is because not all distributed questionnaires are usually retrieved. Therefore, to arrive at a close range of 132 then 150 is distributed. Both descriptive and inferential statistical tools were used such as frequencies, weighted mean and percentages to analyze the data collated.

**Results and Discussion**

**Table 1:** Demographic Information of the Respondents

S/N	Questions	Options	Frequency	%
1	Age	30 and below	26	20.00
		31-40	45	34.62
		41-50	50	38.46
		51 and above	9	6.92
2	Gender	Male	90	69.23
		Female	40	30.77
3	Faculty	Science	21	16.15
		Art & Social Science	32	24.62
		Education	50	38.46
		Pharmaceutical sciences	13	10.00
		Basic & med/clinical sci.	14	10.77
4	Level of postgraduate program	Post graduate Diploma	62	47.69
		Master's	48	36.92
		Doctor of Philosophy	20	15.38

Table 1: Contd.				
5	Mode of study	Part Time Program	12	9.23
		Full Time Program	118	90.77
6	Studying in University Library	Yes	35	26.92
		No	95	73.08
7	Library use frequency	Multiple times a week	5	3.85
		Once a week	10	7.69
		Few times a month	15	11.54
		Rarely	5	3.85
8	Alternative place of study	Class Room	75	57.69
		Open Space	20	15.38
		Personal Room	35	26.92
9	Reasons for not studying in the library	It's boring	53	40.77
		Not comfortable	25	19.23
		Its noisy	10	7.69
		No innovative design features	42	32.31

Source: Field Survey, 2024.

The table presents the respondent's (postgraduate students) profile in Gombe State University, from the results, most of the respondents are between the age bracket of 41-50 (38.46%) followed by 31-40 years represented by 34.62% respectively, below 30 years have a frequency of 26 (20%) while 51 and above have the least respondents 9 (6.92%). The results indicate that most of the respondents are male with 90 responses while the female has 40 representing 69.23% and 30.77% respectively.

The results indicate that respondents from the faculty of education have the highest frequency of 50 (38.46%) followed by the faculty of art and social science, faculty of science, basic and medical sciences, and finally the faculty of pharmaceutical sciences with a corresponding weight of 32 (42.62%), 21 (16.15%), 14 (10.77%) and 13 (10%) respectively. The result further indicates that the majority of the respondents are pursuing a Post Graduate Diploma 62 (47.69%), followed by a master's program and a Doctor of Philosophy with 48 (36.92%) and 20 (15.38%) respectively.

Only 12 (9.23%) respondents are running part-time programs, other respondents are on full-time programs 118 (90.77%). Most of the students are not studying in the university library 95 (73.08%) while 35 (26.92%) are considered to be studying in the university library based on their responses. Among those studying in the library, 15 (11.54%) visit the library a few times in a month, 10 (7.69%) once a week while rarely visiting and multiple times a week each represented by 5 responses (3.85%) respectively.

According to the respondents, the alternative place of study apart from the university library includes; Classroom 75 (57.69%), personal room 35 (26.92%), and open space 20 (15.38%) respectively. Furthermore, according to the results, the majority of the students

don't patronize the university library because it's boring 53 (40.77%), has no innovative design features 42 (32.31%), not comfortable 25 (19.23%) and finally, it's noisy 10 (7.69%) respectively. However, this finding is contrary to the findings of Bature (2009) who showed that the majority of students from four tertiary institutions in Nigeria use the library to prepare for examinations (50.5%) and to do assignments (20%) purpose of visiting the library. A minority of the respondents indicated that they use the library as a location for meeting friends. This represents the least reason for visiting academic libraries.

**Table 2:** Factors Influencing Academic Library Design

No	Factors	W. Mean	S. Deviation	Rank
1	Sustainable design features	3.8113	1.32961	4 <sup>th</sup>
2	Technology Integration	4.1607	0.59625	2 <sup>nd</sup>
3	Space Utilization	2.0536	1.05175	10 <sup>th</sup>
4	Flexibility	3.7143	1.13961	5 <sup>th</sup>
5	Collaboration and interaction	2.1429	1.06904	9 <sup>th</sup>
6	Innovative design features	4.0357	0.87312	3 <sup>rd</sup>
7	Users need and preferences	4.3457	0.97312	1 <sup>st</sup>
8	Energy Efficiency	2.5357	0.99021	8 <sup>th</sup>
9	All-inclusive design	3.0536	1.94861	6 <sup>th</sup>
10	Communication & Collaboration	2.6357	0.90021	7 <sup>th</sup>

**Source:** Field Survey, 2024.

The result revealed that user need and preferences are the 1st factor including academic library design with a weighted mean and standard deviation of 4.3457 (0.7312), and technology integration is ranked 2nd with 4.1607 (0.59625). innovative design features ranked 3rd with a mean of 4.0357 (0.87312). flexibility, all-inclusive design, communication, and collaboration are ranked 5th, 6th, and 7th with a corresponding mean and SD of 3.7143 (1.13961), 3.0536 (1.94861), and 2.6357 (0.90021) respectively. Factors with low influence according to the results are energy efficiency 2.5357 (0.99021) followed by collaboration and interaction and finally space utilization which was ranked 8th, 9th and 10th respectively with a corresponding weight of 2.1429 (1.06904), and 2.0536 (1.05175).

These findings are similar to that of Edwards (2011) where it was found that factors influencing library design include energy efficiency, sustainability, comfort, and climate considerations. Modern designs focus on environmental sustainability, drawing inspiration from Scandinavian modernist libraries. These findings also align with the findings of Vandor (2019), the study found that students have unpleasant experiences with finding seats in the library. The study highlighted user needs for as personalized desk lamps and comfortable furniture. The study emphasizes managing user needs for a positive library experience. Suggestions include a mobile app for real-time seat availability and personalized amenities to enhance satisfaction with library design. Also, Nawarathne and Singh (2012) also found that user satisfaction with library design is crucial for academic libraries, and understanding



user needs and continuously improving infrastructure are key factors in enhancing satisfaction levels among library users.

Moreso, the research findings are contrary to that of Cox (2023) the study found that factors influencing library design include changing pedagogies, student diversity, technology, estates management, staff readiness, cost, decision-making speed, student well-being, sustainability, equality, diversity, inclusion, co-design with students, and new technologies. Also, Osłowska (2022) found that technologies, materials, and current trends influence contemporary library design, shaping multifunctional spaces that evoke positive emotions and promote dialogue and experiences among users, enhancing urban environments. Other contrary findings are that of Larasati and Juvitasari (2022) Factors influencing library design include layout, color, lighting, air circulation, and sound system. Service, infrastructure, place attractiveness, and security also impact user interest in visiting the library.

This is also similar to the results of Latimer (2022) where it is found that factors influencing library design include sustainability, well-being, reuse of old buildings, sense of identity, and indoor/outdoor connectivity. These trends shape modern library architecture in the UK and Ireland. Moreover, Shrivastava, Patidar, and Gupta (2018) found that Factors influencing library design include digitalization, green initiatives, IT systems, and total quality management. Considerations like size, orientation, energy efficiency, and technological advancements play crucial roles in modern library architecture. Other findings include that of Liu, Han, Yan, and Ren (2023) who found that factors influencing library design include sunlight duration, radiation, and dynamic shading components. Parametric design methods optimize lighting performance based on these factors for enhanced user experience.

### **Conclusion and Recommendation**

This study has investigated factors influencing academic library design for sustainable educational growth and development. Based on the study findings, it is concluded that user requirement/need is considered as the most significant factor influencing library design other significant factors include technology integration and modern innovative design features. The design of libraries should consider the requirements and desires of their users. Institutions need to involve students, faculty, and other stakeholders in the design phase through methods such as surveys, focus groups, and gathering user feedback. By integrating user perspectives into the design process, libraries can develop spaces that are easy to navigate, inviting, and supportive of both individual study and group work. The design of libraries is a continual endeavor, necessitating frequent assessment and enhancement. Institutions should implement methods for evaluating the efficiency of library facilities and offerings, actively seeking input from users, and using data-driven insights to enhance the library experience. By fostering a culture of ongoing enhancement, libraries can evolve to meet evolving demands and maintain relevance within the dynamic educational environment.



Finally, based on the findings of this study on academic library design in universities, several recommendations can be made to improve the design and functionality of academic libraries, these includes; involvement of stakeholders, user-centric design, integration of technology, innovative design features, sustainable design, emphasis on learning environment, strategic vision. by implementing these recommendations, academic institutions can enhance the functionality, sustainability, and user experience of their academic libraries, contributing to a more supportive and conducive learning environment for students and faculty.

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