

## A COMPARATIVE STUDY OF FLEXIBILITY AND FUNCTIONALITY OF LIBRARY DESIGN IN LAGOS STATE NIGERIA

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### Abstract

*Libraries, whether in educational institutions or public spaces, serve as crucial centres for knowledge dissemination and personal development, offering diverse materials and services to meet the needs of users and promote societal advancement. Specifically, university libraries are at the heart of academic life, where they gather, sort, and distribute informational resources. They also offer tailored services that align with their parent institutions' goals, aiding in the achievement of students' and faculty members' educational and research objectives. This study aim to carry out a comparative study of the flexibility and functionality of library design in Lagos state Nigeria. The objectives of this paper are: to study different definitions from several authors to have a broad base understanding of the usage, and to examine the concept of flexibility and functionality in architecture. Which are crucial for adapting the evolving user needs and market fluctuations, involving both active and natural flexible elements in design. Libraries, as dynamic centres in the twenty-first century, require flexible spaces with mobile furnishings to accommodate changing technological and user demands. Both psychologically and physically, flexibility plays a vital role in library design, allowing for a willingness to change and adaptability in the face of evolving needs. Libraries must consider layout and service flexibility to effectively respond to population growth, demographic shifts, and changing service requirements. The design of libraries involves considerations such as appropriate furniture, green initiatives, and accessibility features, aiming to enhance functionality, attractiveness, and energy efficiency. Academic libraries, seen as essential components of educational institutions, require careful design for individual flexibility, variety, and personalization. The architectural vision and management of building processes are crucial for achieving effective library functionality.*

**Keywords:** Flexibility in library, functionality in library, library architecture, library design and user experience.



## 1.0 Introduction

This article embarks on a comprehensive exploration of library design in Lagos State, Nigeria, delving into the nuanced aspects of flexibility and functionality. A library is characterized as a (Oni & Adomi, 2023) communal area that is heavily staffed with knowledgeable professionals. It's an establishment that excels in the acquisition, organization, preservation, and dissemination of documents, and it promotes the application of science, culture, and education Gu & Tanoue, (2022). Zheng et al., (2022) said that the library is depicted as a communal space where educators and learners engage in study. The university library, with its high concentration of staff and substantial foot traffic, is a prime example of such a venue. Jahangir et al., (2021) recognized that university libraries are seen as the core of universities due to their pivotal role for students and researchers. Additionally, it's stated that the primary duty of university libraries is to foster research setting that aids students and researchers in expanding their understanding. In order to efficiently use information in the academic community, services such as collection, storage, and dissemination are required. Librarians and library personnel provide these services in the circulation, acquisition, cataloguing, serial, and reference departments to meet the needs and interests of their clients. Khairunnisyah et al., (2023) described the school library as one of the educational tools that schools use to assist instruction, thus it is important to treat it seriously. The duties of the school library include providing knowledge, promoting moral education, executing thoughtful instruction, and assisting students in developing their entire selves. Dobrovolska et al., (2022); Lisbdnetwork, (2014) said that a library is characterized as a place where items of literary, musical, artistic, or reference nature (like books, manuscripts, records, or films) are kept for utilization but are not available for purchase. American Library Association, (2022) & Library, (2019) said that a library is a collection of resources in various formats, organized by information experts or other professionals who provide convenient access to these resources in physical, digital, bibliographic, or intellectual forms. It also offers tailored services and activities aimed at enlightening, educating, or entertaining a variety of audiences, while also fostering personal development and societal progress. Hence, a library can be defined as a building, room, or institution that contains a collection of books, documents, music, and sometimes tools or artwork, which people can borrow at no cost (American Library Association, 2022). Britannica, (n.d.) said that a library is described as an assembly of books intended for reading or studying, and the building or area that accommodates this collection. Also the same source (Britannica, n.d.) said that the term "library" originates from the Latin term "liber," translating to "book." In languages such as German, Russian, and the Romance languages, the term is derived from a Greek word that has been Latinized, known as "bibliotheca" (Britannica, n.d.). Moses, (2021) indicated that libraries have traditionally promoted education and helped to expand literacy by providing instructional materials, book collections, electronic resources, periodicals, and multimedia goods. Temboge and Ga'anda, (2022) said that university libraries bear the duty of collecting, processing, structuring, and distributing informational resources; moreover, they also offer services that align with the library's goals and objectives. Libraries deliver a range of services to fulfill the mission of their parent institution, particularly catering to the needs of their users (Temboge & Ga'anda, 2022). Yadi and Dinata, (2022) said that a library is a compilation of books and periodicals. While it could be seen as a personal collection, it's more typically recognized as a substantial assortment that is funded and managed by a city or institution (Yadi & Dinata, 2022). It serves individuals who, on average, may not have the means



to purchase a vast quantity of books on their own (Yadi & Dinata, 2022). Adler, (2020) said that a university library is set up, managed, and sustained to support the university in five key areas - facilitating teaching and learning; conducting research and creating new insights; distributing and publishing research findings; preserving knowledge and concepts; and implementing outreach initiatives. Zheng et al., (2022) said that a university library, being a common public space, houses an extensive array of books, leading to a high fire load. It often has a high concentration of people and significant foot traffic. Therefore, the circumstances surrounding safe evacuation during a fire are of great concern. Hugar and Bardez, (2023) said that libraries grant unrestricted access to a broad range of informational resources, including books, newspapers, magazines, and digital content. Therefore, public libraries across Indian states are proactive in fostering literacy and education (Hugar & Bardez, 2023). Moreover, they conduct reading schemes, storytelling events, and literacy campaigns to instill a love for reading in both children and adults.

## **2.0 Literature Review**

### **2.1 Flexibility in library design**

Nasir, (2024) said that in the field of Architecture, flexibility denotes the ability of a structure or space to be suitably modified and that this allows a building to evolve over time in response to the changing needs of the user, adapt to market changes, and prolong the lifespan of the project. Nasir, (2024) said that Architecture that is unable to adjust to changes risks becoming stagnant and outdated. Flexibility can manifest as active flexibility, like movable walls, or inherent flexibility, such as multipurpose spaces, open-concept offices, large floor-to-ceiling heights, and service voids with high capacity (Nasir, 2024). This could involve contemplating relatively simple design options; for instance, it might be quite easy to add or remove a bay to increase or decrease the size of a linear structure, but modifying a circular building could be extremely challenging without compromising the integrity of the design (Nasir, 2024). Napolitani, (2020) in her introductory remarks, said that library in the 21st century have evolved into vibrant hubs. She stresses that the unpredictability of future technological shifts and the swift alteration in the requirements of library patrons cannot be overlooked and necessitates enhanced adaptability of spaces, with movable fixtures and furniture that can be reconfigured in conjunction with their incorporated technical setup (Napolitani, 2020). Bal and Izak, (2021) said that flexibility can be viewed from both a psychological and physical perspective. Psychologically, it could be described as a “readiness to change or make concessions.” Furthermore, on a physical level, it is defined as “the attribute of bending effortlessly without snapping” and “the capacity to be modified with ease.” These two facets of flexibility are significant because they suggest a dual interpretation of the concept, not just in terms of a person’s or organization’s willingness and capability to adapt, but also in the sense of being able to move without breaking (Bal & Izak, 2021). State, (2024) said that layout and service requirements change so quickly that a new library facility must be planned with flexibility in mind. When examining a community's needs and service supply, variables such as population growth, demographic changes, and service delivery may result in additional space requirements or extension plans that must be incorporated into the conceptual and physical design. It is not feasible to forecast all future demands, but an approach to the design that provides flexibility and adaptation will make it easier to modify the



function of the library space (State, 2024). This approach to library design seeks to produce a more integrated and adaptable community resource.

## **2.2 Functionality in Library Design**

AlSaggaf and Jrade, (2023) said that Site Layout Planning (SLP) is defined as the organization of materials, amenities, and machinery within the confines of a construction project area. The main objective of SLP is to create a site that facilitates construction operations effectively throughout the duration of the project, while ensuring a safe and almost dispute-free environment both within the site and in its immediate vicinity (AlSaggaf & Jrade, 2023). Choy and Goh, (2016) discuss appropriate furniture and that furnishing in the library may significantly improve the attractiveness and functionality of the areas. This, in turn, improves its appeal to encourage students to fully utilize the spaces, and referral services. The Digital Library Reference Model characterizes digital library as “An entity, possibly virtual, that extensively gathers, administers, and safeguards rich digital content for an extended period, and provides its user communities with specialized features on that content, of quantifiable quality and in accordance with established policies” (Yadav, 2023). Gu and Tanoue, (2022) go on to suggest that conventional libraries still serve the same essential purposes; and in addition, to increase the functions of today's conventional libraries, this type of service idea has to be expanded toward multifunctionality and omnipotence in today's reasonably advanced science and technology. Franklin and Da Cruz Duran, (2021) remarks that the library may be unexpectedly identified across the course of documented time given its persistent presence in the history of written civilization, even if it collects many features, modes of operation, and interactions between players. Alison, (2016) said that functional design can be an activity, a product, or both. Functionality, as a result, represents designs that operate effectively and assist users in completing their given tasks and as a process, it refers to a collection of methods driven by the concept that provide good outcomes. Alison, (2016) further said that usefulness necessitated understanding who utilized a place, why, and how to best support users' duties in the area's design. Samrgandi, (2020) mentioned that people form their ideas based on how the system functions, which is determined by intuition and experience. That is to say, they base their decisions on how well they can resolve a problem. Chauhan et al., (2023) said that the library may need to work with various suppliers for each, pay for expenses independently, and maintain them independently. The majority of Traditional Integrated Library Systems (ILSs) were created using outdated monolithic design, which combines all software functions into a single code base (Chauhan et al., 2023). Esan and Ifijeh, (2023) said that academic libraries need to continuously offer resources, services, and facilities that will draw customers in order to be relevant, especially in the age of information explosion. One method to achieve this is by improving the building's design and functioning. Esan and Ifijeh, (2023) additionally mention that the provision of wheelchair ramps for easy access, installation of outlets for charging devices, internet access, enough furniture for sitting and reading, enough cloakroom lockers, sufficient ventilation, central library location, availability of parking, and other features can all be considered functionalities of a university library. Simply said, library building functionality is the library's capacity to carry out the purposes for which it was first intended (Esan and Ifijeh, 2023).



### 2.3 Library Architecture

Moses Onosemuode, (2021) said that the library building, with its ideal types, model libraries, and unique character, has developed into a unique architectural form associated with modernism and societal modernization, symbolizing the expansion of "library-ness." A specialized discourse on library architecture and design has emerged as a result of books, articles, suggestions from users and library associations, professional conversations (Moses Onosemuode, 2021). Yadav, (2023) said that enlisting green libraries are to provide information on energy efficiency, sustainable construction, and the requirements of a library and further say the green library was founded in the 1990s. Therefore, green library is gaining popularity in the field of library and information science; and a librarian was also developing a library intending to use the least amount of electricity while maintaining environmental friendliness and energy efficiency (Yadav, 2023). In order to fight global warming and climate change, several libraries are thinking about constructing ecologically friendly buildings and green libraries are invariably sustainable and considerate of the environment (Yadav, 2023). Flores et al., (2021) said that since academic libraries serve as the focal point of the whole educational institution, they are an essential component of library administration and should be treated with great care. It goes beyond just drafting a floor plan and involves more than just the actual arrangement of the library; and it must be able to offer fresh chances for cooperation, place a strong emphasis on individual flexibility and variety, and allow for personalization (Flores et al., 2021). Oyebola et al., (2019) discussed that architecture serves as the main conduit for system attributes such as performance, adaptability, and security, all of which cannot be realized without a cohesive architectural vision. Architecture is a tool for preliminary analysis to ensure that a design strategy will result in a satisfactory system; and hence, by constructing a robust architecture, we can pinpoint design hazards and alleviate them early in the development cycle (Oyebola et al., 2019). Mondal, (2021) stated that the construction and evolution of a library building hinge on the administration of building development and construction procedures. These processes vary across different environments due to factors such as the scale, functions, location, materials utilized, cost, and the intended use of the buildings (Mondal, 2021). Likewise, building processes are influenced by the extent of financial commitment, the management of the construction process, architecture, construction methods, and environmental factors related to location, politics, economics, and culture (Mondal, 2021). Brunskill, (2020) said that library architectural design addresses the need to increase privacy in large, open spaces. The design of a space significantly influences how comfortable patrons feels; and privacy, in this context, relates to visibility and the ability to make noise without being overheard (Brunskill, 2020). The literature suggests that privacy in open spaces can be improved by placing dividers or partitions between group of tables arrangements and by varying the type and height of furniture in quiet spaces. Secondly, the information discusses the need to isolate noisy zones from quiet zones (Brunskill, 2020). Libraries need to balance the requirement for quiet study environments with the need for spaces that accommodate group work and socializing; and one of the strategies is to position noisy spaces near other sources of noise and to isolate quiet spaces from these noise sources (Brunskill, 2020). Thirdly, the available information in literature suggests the creation of reservable private study rooms; while these rooms can cater to students needing spaces free of distractions and patrons with mobility issues or limited time to study (Brunskill, 2020). Lastly, the available information highlights the need to improve outreach around library spaces; and currently, patrons





have limited options for learning about the available spaces, often resorting to exhaustive circuits around the buildings to discover what's available (Brunskill, 2020). Therefore, Brunskill suggests a need for more effective signage and online information about the spaces. Jessica, (2022) said that "Today's library embodies a multitude of roles," and Jennifer Charzewski, (the lead architect at Liollo - an architecture firm based in Charleston) further articulates that "A library serves as a meeting spot, a museum, a park, a school, and a community hub." Consequently, as they commence new constructions and refurbishments, library designers are placing a high priority on flexibility to accommodate potential future needs (Jessica, 2022).

## **2.4 User Experience**

Temboge and Ga'anda, (2022) said that user satisfaction refers to the way users assess whether a product or service fulfills their needs and meets their expectations. In the context of libraries, user satisfaction is the measure by which users evaluate the sufficiency of the library's information resources and services provided to them, and whether these services align with their expectations (Temboge & Ga'anda, 2022). Bell, (2018) said that the Metaverse is a shared virtual space that aims to create a sense of presence and immersion that is not possible with traditional online interactions; and users can interact with each other and with virtual objects within this space, creating a highly realistic and immersive experience. Yadav, (2023) said that podcasts provide a flexible and easy way for users to publish their work on the Internet; and it will help researchers to identify ways that the technology can be exploited to maximize the users' learning experiences. Samrgandi, (2020) said that user experience widely accepted that academic libraries have emerged as hubs for evaluating the effectiveness of virtual environments. Bell, (2018) stated that universities have made concerted efforts to align their library services with a positive user experience and furthermore, it was expressed that the user experience aids in understanding how an individual forms a bond after interacting with a system. Universities have dedicated themselves to making information and resources accessible through the spaces on library websites (Bell, 2018). The concept of library user experiences has been around for as long as libraries themselves; and this is inevitable, as humans naturally have experiences when interacting with their immediate environment (Bell, 2018). Every time members of the user community interact with the library at any point of contact - be it the entrance, the website, the book stacks, the service desk, or the virtual chat function - an experience occurs (Bell, 2018).

## **3.0 Methods**

A systematic review of journals between 2020 and till date (2024) with several PDF files downloaded from the ResearchGate, Elsevier, Taylor and Francis and other online articles. These were grouped into thematic formats for critical analysis which forms the base of this qualitative analysis. The executive summary of literature (ESTOL) helped in this critical analysis.

### **Table 1: Executive summary of literature**

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S/n	Author	year	Country of origin	Aim	Methodology	Gap Identified
1	Mondal, Hafijull	2021	India	Evaluate the Planning, Principle & Standards In The Perspective Of 21st Century	Qualitative analysis	lack of comprehensive and systematic guidelines for planning, designing, and constructing library buildings that meet the diverse and dynamic needs of the users and the society in the 21st century.
2	Esan, Adedoyin Oluwatosin Ifijeh, Ajelomohie Blessing	2023	Nigeria	to find out the influence of library building aesthetics and functionality on the patronage of university library	descriptive analysis	the lack of empirical studies on the relationship between library building aesthetics and functionality and library patronage in Nigeria.
3	Flores, Roana Marie De Leon, Simon V. Valerio, Marita G.	2021	Philippines	to provide a modified conceptual framework that can be applied to academic libraries in designing and repurposing spaces for better user experience.	Systematic literature review	the lack of a comprehensive and organic framework for library space design that can be applied to academic libraries
4	Demeter, Michelle	2023	Chicago, Illinois	to review of designing libraries for the 21 <sup>st</sup> Century	Book review	transformation of library spaces from traditional book repositories to multifunctional, user-centered environments that support a range of scholarly activities.
5	Oso, Olutoyin Olukemi	2023	Nigeria	to investigate experience of academic libraries in South-West Nigeria	descriptive survey	<a href="#">is the challenge academic libraries face when handling book donations that come with conditions or strings attached.</a>

#### 4.0 Results

**Table 2: Findings**

s/n	Objectives	Elsevier	Taylor & Francis	ResearchGate	Others	Total
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1	Flexibility in library	0	0	1	3	4
2	Functionality in library	1	1	6	0	8
3	Library architecture	0	0	4	1	5
4	User experience	0	0	4	1	5
Ratings		1	1	15	5	22

The table presents a comparative analysis of different objectives related to library services, as assessed by different sources. Four objectives are listed: flexibility in the library, functionality in the library, library architecture, and user experience. Each objective is evaluated by four sources: Elsevier, Taylor & Francis, ResearchGate, and others.

For the objective of flexibility in the library, ResearchGate and the "Others" category gave the highest rating, with three and four points respectively, while Elsevier and Taylor & Francis didn't assign any points. In terms of functionality in the library, ResearchGate and the "Others" category again gave the highest rating, with six and eight points respectively. Elsevier and Taylor & Francis each awarded one point. Library architecture received the highest ratings from ResearchGate and the "Others" category, with four and five points respectively, whereas Elsevier and Taylor & Francis didn't assign any points to this objective. For user experience, ResearchGate and the "Others" category again provided the highest ratings, with four and five points respectively, while Elsevier and Taylor & Francis didn't give any points.

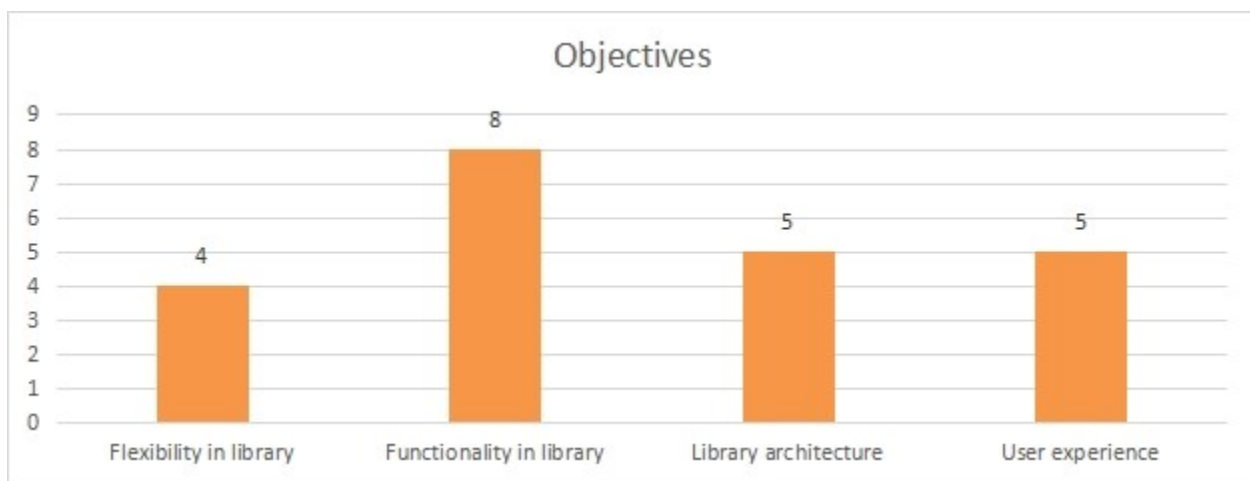


Figure 1: Showing objective analysis.





The chart provides a visual representation of the prioritization of different objectives related to a library. It uses a horizontal bar chart format, with the objectives listed on the x-axis and the scores given to each objective on the y-axis. The highest priority is given to “Functionality in Library” with a score of 8, indicating that it is considered the most important aspect. This suggests that how well the library serves its intended purpose, such as supporting the activities of its users, is of paramount importance. “Library Architecture” and “User Experience” both have a score of 5, suggesting that these aspects are also considered important, but not as critical as functionality. Library architecture refers to the physical design of the library, while user experience involves how users interact with the library and its services. The least priority is given to “Flexibility in Library” with a score of 4. Despite its lower score, flexibility is still a significant aspect of library design. It refers to the ability of the library space to adapt to changing needs and advancements in technology.

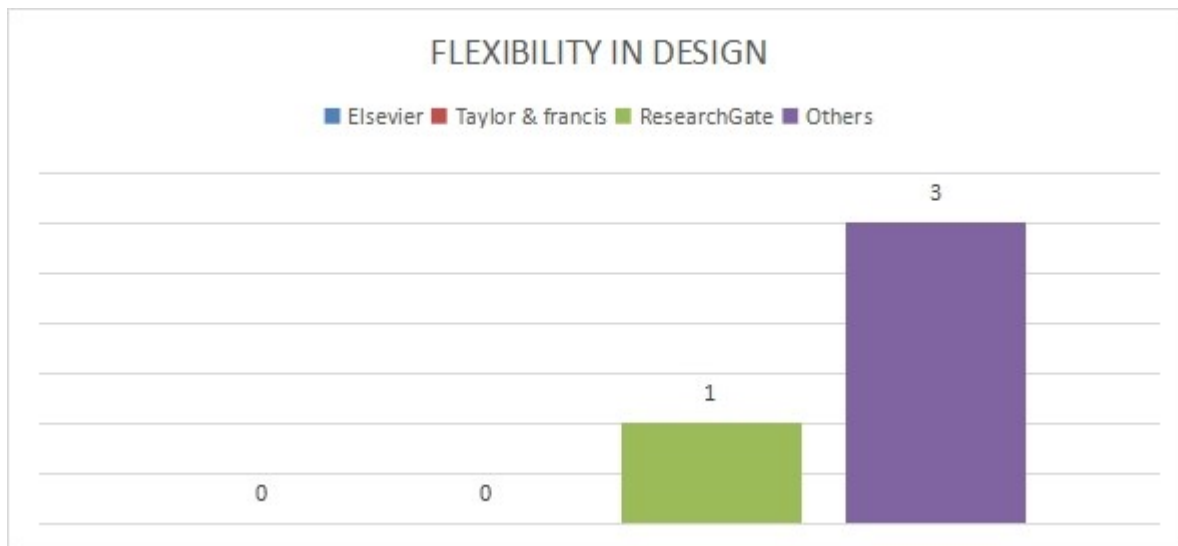


Figure 2: Flexibility analysis.

The chart is a bar graph titled “Flexibility in Design” and it compares the level of design flexibility among four different entities: Elsevier, Taylor & Francis, ResearchGate, and Others.

**Elsevier** and **Taylor & Francis** both have a flexibility score of 0, indicating no flexibility in their design, while the **ResearchGate** has a slightly higher flexibility score of 1, suggesting a low level of design flexibility and the group labeled as **Others** has the highest score of 3, indicating a high level of design flexibility.





Figure 3: Functionality analysis.

The chart is a horizontal bar graph titled “Functionality in Library”. It compares the level of library functionality among four different entities: Elsevier, Taylor & Francis, ResearchGate, and Others.

**Elsevier** has a high functionality score of 60, indicating a significant level of functionality in their library design while **Taylor & Francis** has a functionality score of around 10, suggesting a moderate level of functionality and **ResearchGate** has a low functionality score of less than 5, indicating limited functionality in their library design and lastly the category labeled as **Others** does not have a visible bar, suggesting that the functionality level might be negligible or not available.



Figure 4: Library architecture analysis.

The chart titled “Library Architecture” compares the number of resources or documents available from four different sources: Elsevier, Taylor & Francis, ResearchGate, and Others.

**Elsevier** has the highest number of resources, with a total of 4, **Taylor & Francis** has significantly fewer resources, with only 1 while both **ResearchGate** and **Others** do not have any resources according to the chart.

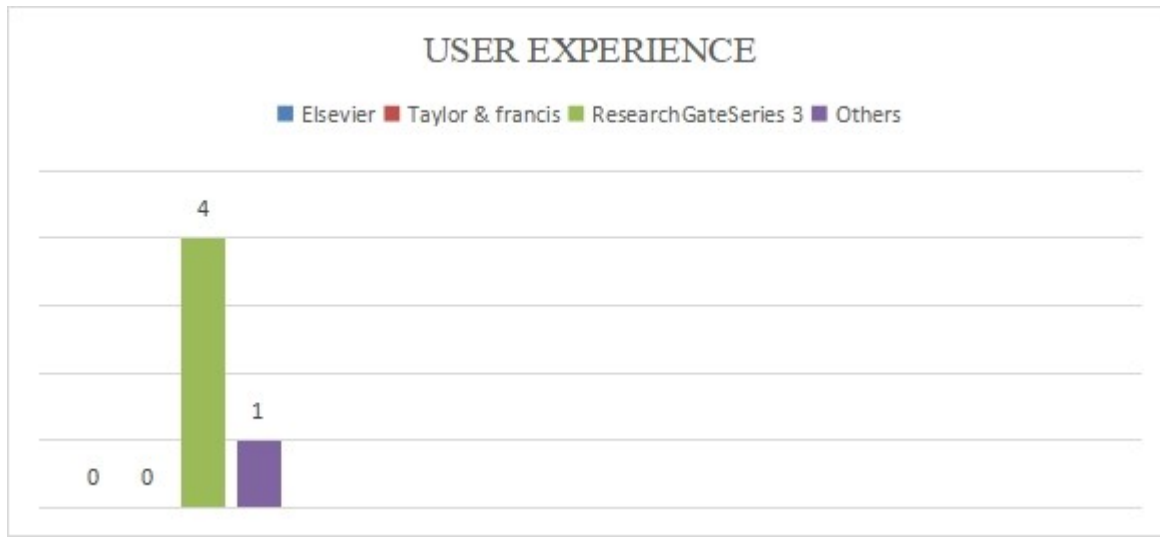


Figure 5: User experiences analysis.

The chart titled “User Experience” compares the user experience ratings for four different entities: Elsevier, Taylor & Francis, ResearchGate, and Others.

**Elsevier** has the highest user experience rating of 4, indicating a positive user experience while **Taylor & Francis** has a user experience rating of 1, suggesting a less positive user experience compared to Elsevier and both **ResearchGate** and **Others** have a user experience rating of 0, indicating a poor or non-existent user experience.

Bal and Izak, (2021) expresses in their finding that the concept of flexibility in architecture is crucial for adapting to evolving user needs and market fluctuations, involving both active and natural flexible elements in design. Demeter, (2023) said that libraries, as dynamic centers in the twenty-first century, require flexible spaces with mobile furnishings to accommodate changing technological and user demands. Napolitani, (2020) & Nasir, (2024) said that flexibility, both psychologically and physically, plays a vital role in library design, allowing for a willingness to change and adaptability in the face of evolving needs. Libraries must consider layout and service flexibility to effectively respond to population growth, demographic shifts, and changing service requirements Bal & Izak, (2021); State, (2024). The design of libraries involves considerations such as appropriate furniture, green initiatives, and accessibility features, aiming to enhance



functionality, attractiveness, and energy efficiency Choy & Goh, (2016); Esan & Ifijeh, (2023); Yadav, (2023). Academic libraries, seen as essential components of educational institutions, require careful design for individual flexibility, variety, and personalization; and the architectural vision and management of building processes are crucial for achieving effective library functionality Oyebola et al., (2019); Mondal, (2021).

Napolitani, (2020) expatiates that the COVID-19 pandemic necessitated swift adaptation to lockdown measures and remote work, highlighting the critical importance of flexibility in both library spaces and pandemic management. Therefore, in response to the increasing dynamism of libraries in the 21st century, flexibility in spaces and services has become essential to meet evolving needs. Moreover, Napolitani, (2020) stressed that despite pandemic challenges, scholarly articles have been successfully produced, underscoring the significance of user-oriented and creative approaches in library spaces. Technological integration plays a crucial role in enhancing flexibility and adaptability in library environments, particularly in light of COVID-19's impact on pharmaceutical information dissemination and research (Napolitani, 2020). The JEAHIL journal has experienced success and popularity, evidenced by high download and viewing statistics, highlighting the role of sponsorship and advertising in supporting its operations. Furthermore, data analysis is valuable in understanding readership and engagement with the journal, contributing to its ongoing success.

Chauhan et al., (2023) said in his findings, he highlights the potential benefits and limitations of Future of Library Is Open (FOLIO), a Library Service Platform (LSP), compared to Traditional Integrated Library Systems (TLSs): Therefore, the benefits of FOLIO consolidate multiple software services onto one platform, reducing the need for libraries to manage and maintain several software subscriptions. Its technology and architecture offer futuristic capabilities, particularly in managing e-resources, surpassing current TLSs. While FOLIO deployments are currently limited, literature suggests that adoption of new technologies is gradual but necessary for libraries to remain relevant in a changing world. FOLIO offers a promising solution for libraries facing budget constraints and the challenge of managing multiple software applications. Its flexibility, features, and sustainability make it a viable option for shaping the future of libraries. However, careful consideration of its limitations, such as technical requirements and localization support, is necessary before implementation. Overall, open-source software like FOLIO presents a compelling alternative to traditional TLSs for libraries seeking to streamline their operations and adapt to evolving technological landscapes.

## **5.0 Conclusion and Recommendations**

### **5.1 Conclusion**

The future of library design and management hinges on the concept of flexibility and functionality, both in physical spaces and in the services offered. This flexibility allows libraries to adapt to changing user needs, technological advancements, and unforeseen circumstances like the COVID-19 pandemic. Furthermore, the adoption of open-source platforms like FOLIO can help libraries streamline their operations and remain relevant in a rapidly changing world.



However, the successful implementation of these changes requires careful planning, consideration of potential limitations, and a commitment to ongoing adaptation and improvement.

## 5.2 Recommendations

The crucial role of flexibility and functionality in library design and management, especially in response to evolving user needs and challenges like the COVID-19 pandemic. Key points include the need for adaptable architecture, psychological and physical flexibility, consideration of factors like technology integration and academic requirements, and exploration of innovative solutions like FOLIO for library systems. Overall, libraries must prioritize flexibility to effectively serve their communities in a dynamic environment and emphasis on flexibility encompasses architectural elements like mobile furnishings, psychological adaptability to change, and technological integration to meet evolving demands. Academic libraries are highlighted as requiring personalized designs, while innovative solutions such as FOLIO offer promising benefits but require careful consideration of limitations. In essence, libraries must embrace flexibility to remain relevant and resilient in the face of shifting needs and technological advancements.

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