The Role of Architectural Design in Effective Delivery of Library Services: A Case Study of University Libraries in Edo State, Nigeria

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Abstract. This study investigated the role of architectural design in effective delivery of library services: a case study of university libraries in Edo State, Nigeria. The purpose of the study was to determine the extent to which architectural library designs effective library services. The study adopted a descriptive survey research design. The population of the study was made up of 80 librarians in seven university libraries in Edo State, Nigeria. Data was collected through questionnaire and analyzed with the use of **percentages**. Findings reveal that librarians in university libraries in Edo State, Nigeria observed that their library architecture play the role of a learning centre with 67%. The libraries also fit into new information communication technology (26%) and a place of social capital (23%).   The three characteristics that best describe the library architecture are that they are accessible (16%), functional (15%) and suitable for information technology (15%). The problem librarians face with library architecture are majorly ventilation and heat (11% respectively). The types of spaces included more in the library architecture are magazines/newspapers (9%) and individual study space (8%). The study found that space library architecture support are more of research support and students learning and development (17% respectively). The most functional spaces in the library is textbook collection (18%), cataloging (16%) and magazines/newspapers (10%). The reason these spaces are most effective is because of service (47%). Furthermore, the least functional spaces are the canteen (11%) and bindery (10%). The reason for the ineffectiveness is identified as poor design (37%). The library design was identified to help the librarians more for information research (62%). However, majority are partially satisfied with the architectural design of their university libraries (41%). This study concluded that physical remodeling and systemic redesigning of the university library architectures are important to make effective delivery of library services. This study recommends the study or architecture by student librarians and the position of an architecture librarian as a way to tackle these issues.

Keywords: Architecture, Design, Library, Service, University Library, Edo State, Nigeria

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1. Introduction

Library buildings are closely tied together with library services. Reinventing effective roles for academic libraries in teaching and learning involves rethinking the library's physical architecture and spaces. This is because every library building models service oriented architecture. Thus, an academic library is much more than a physical structure. As Battles (2003) suggested, it is a structure that arranges and re-arranges access to knowledge and other social resources within an academic community. Libraries architecture present themselves to the public in specific ways and with specific images such as: centers for pedagogical training, cultural landmark, center for inspirational lifestyles, agency of public information, center for community and a meeting place. Each library's architecture reflects the priority services and values being offered in that library for its particular set of users (Fox, 2012).

The growing role of the library has created a set of new and complex challenges for library buildings and those delivering services. Housing print media was the traditional role of libraries. In today's digital world, internet access, electronic media, computer technology, and other forms of technological growth have great effect on the function and design of library architecture. Thus, flexibility and adaptability in the design, functionality and aesthetics are essential in order for the library to be effective in service delivery to its community. The libraries of the 21st century are no longer simply repositories for books; they are evolving and stretched, being rethought and redesigned to meet the needs of a constant generational and academic shift. Libraries now provide an increasing range of multifarious services using a huge number of media, and reach a more diverse audience than used to be. A number of successful new designs for library buildings show how these draw on traditional library architectural typologies, as well as embodying new ideas have responded to the widespread use of information and communications technology (ICT), social interaction, psychological support and the culture of lifelong pedagogical training (Academic Library, 2011). It is in this light that this paper is focused on academic libraries of universities in Edo State, Nigeria consisting of: John Harris library, university of Benin (UNIBEN), Tayo Akpata University, Ekiadolor (TAU), Benson Idahosa Univeristy, Benin City (BIU), Sanusi Library, Igbinedion University, Okada (IUO), Edo State University, Iyamo (ESU), Ambrose Alli University, Ekpoma (AAU) and Samuel Adegboyega University, Ogwa (SAU).

2. Statement of the problem

Library architecture is able to aid effective services if it has a clear and precise structure of how it fits into the traditional library service culture in history and accommodates future developmental trends that meets the physical, social, and cognitive needs of its users and the tutorial needs of the university. The academic libraries of universities in Edo state, Nigeria are a mixture of new and old generation architectural designs established at various periods viz UNIBEN

(1970), TAU (1980), BIU (2002), IUO (1999), ESU (2016), AAU (1982) and SAU (2011). In John Harris Library, University of Benin, Nigeria for instance, due to constant power outage, the library's effective service culture is challenging. Located in a temperate region, temperature can sometimes reach between 35-40 degrees centigrade. With no proper ventilation and cooling system, the library can be very inconducive. Furthermore, the library experiences either fluctuating or none Wi-Fi connectivity in certain sessions of administrative offices due to expanded columns in the building that tend to obstruct it. There is no link from the ground floor to the basement which houses the canteen as patrons have to come outside the library to access the facility as the link passage is locked up. The carrels in the first floor are not functional because of limited placement spaces. The staff is in constant state of flux within the confines of the main building. Staff find it difficult to set their service points in a way that could be useful for patrons. Either they are blocked by columns, or they cannot direct patrons to a location because there are no ways to hand signs on the walls.

3.   Literature Review

Genovese and Albanese (2011) stressed that the academic library must have green elements incorporated into it for it to be effective. Weinberger (2012) identified designing and redesigning learning spaces in the library building as crucial for more effective service by librarians. This is because, space, whether physical or virtual has significant impact on work and learning. Spaces stimulate greater academic and psychological interaction for the library user. Worpole (2013) pointed out that for libraries to be effective in delivering effective services it has to find a balance between the patrons and the staff who provide the services of the library. This is because libraries are trans-generational in nature as they blend socialization into the learning environment. . So, Laerkes and Manolis (2013) pointed out that good library space meets a number of important qualities and that, ideally, this new space should be: functional, adaptable, accessible, varied, interactive, conducive, environmentally suitable, safe, secure and efficient. Faklis (2013) observed that academic libraries are part of an educational process and have a mission in relationship with their host community. They exist to support students, staff and academic faculty in their research and education by procuring and making the best print and electronic resources available. IFLA Library Building and Equipment Section, Newsletter (2014, January) stressed that fact that the academic library has always held a strategic position as the heart of an institution in terms of its symbol and physical location. Significantly, the library must serve as the principal building on campus where one can truly experience and benefit from the centrality of an institution's intellectual community.

Duckett, Lippincott and Vedantham (2014) identified that the architecture and the interior design of the library provide patrons and even librarians as a place of leisure and a place of refuge designed for all classes of users including the librarian. Mattern (2014) observed that libraries have come to play social and

symbolic functions for its host community such as serving as "community centers," "public squares" or "think tanks." The library has always been a place where informational and social infrastructures intersect within a physical infrastructure that supports that program of its parent institution. Figueroa (2015) noted that one emerging trend is the role of library building design and spaces play in effective delivery of its services. This is because, according to Gilbert (2014) awareness and understanding of trends can help libraries and librarians actively plan for the work with the communities they serve, open new opportunities to innovate and experiment with and within these "currents" shaping society, and better enable us to envision the integral role we can play in the future.

Vara (2016) investigated the perspective of the librarian, faculty members and PhD students regarding the physical structure and cultural role of the Iranian library with an emphasis on the influence of changing information storage and retrieval technologies in future library building architecture. Chen (2016) stressed that the traditional ways in which lighting is designed and implemented in most libraries do not suit the needs of a digital era It is observable that most researches done on the library architecture and effective delivery of library services have focused more on students and not librarians. Similarly, none of such research known to this researcher has been conducted in Nigeria.

4. Objectives of the study
The specific objectives of the study are:
1. To identify the nature of library architecture in universities in Edo State, Nigeria.
2. To identify the problem library staff face in effective delivery of library services due to the library architecture.
3. To find out which spaces exist as supported by the university library architecture
4. To find out the functional spaces in university libraries in Edo State, Nigeria.
5. To identify the least functional spaces in the library and why.
6. To find out the extent to which library architecture on universities in Edo State, Nigeria contribute to the librarians delivery of effective services.

4.1. Methodology
This study adopted the descriptive survey design. The design was adopted because the study is concerned with the collection of data for the purpose of describing and interpreting the role architectural designs play in effective delivery of library services in university libraries in Edo state, Nigeria and does not involve the manipulation of variables.
The population of this study consisted of respondents made up of library staff who are resident members of the academic communities. The non-probability

sampling technique was used in this study since the entire population of library staff are just a sample of the population. Israel (2009) noted that the whole population would have to be sampled in small proportions to attain a preferred level of accuracy. The instrument that was employed for data collection for this study was questionnaire. The questionnaire was designed by the researcher. One hundred (100) questionnaires each were distributed with seventy nine returned: university of Benin (34),   Tayo Akpata Univeristy (5), Benson Idahosa University (8), Igbinedion University, Okada (13), Edo State University (3), Ambrose Alli University, Ekpoma (12) and Samuel Adegboyega University, Ogwa (4) The researchers personally and used research assistants in the distribution and collation of the questionnaires.

Research Objective 1: To find out the nature of University Library Architecture in Edo State, Nigeria?

Table 1. Roles library architecture plays in University Community.

ROLE	UNIBEN	TAU	BIU	IOU	ESU	AAU	SAU	Total	Percent
Iconic Building	3	0	1	2	0	1	0	7	8%
Landmark	6	1	1	0	0	6	0	14	16%
Learning Centre	28	5	7	10	1	3	4	58	67%
None	1	0	0	0	1	2	0	4	5%
Total	**39**	**7**	**10**	**12**	**2**	**12**	**4**	**86**	

Table 2. The following trends fit best into the present design and use of University library.

TRENDS	UNIBEN	TAU	BIU	IOU	ESU	AAU	SAU	Total	Percent
Population growth	13	1	3	3	0	7	1	28	15%
Academic library as a place for social capital	23	2	4	5	1	8	1	44	23%
Community living room	0	0	1	0	0	1	0	2	1%
Traditional service desk and reading places	10	1	3	1	0	7	2	24	13%
Design excellence and	10	0	2	4	1	3	1	21	11%

function								
Environmentally and ecologically sustainable design	8	0	4	3	1	6	0	22	12%
New information and communication technology	22	3	5	5	3	10	2	50	26%
Total	**86**	**7**	**22**	**21**	**6**	**42**	**7**	**191**	

Table 3. Characteristics that best describes architectural design of library

CHARACTERISTICS	UNIB EN	TA U	BI U	IO U	ES U	AA U	SA U	Tot al	Perc ent
Functional	25	3	4	3	1	11	4	51	15%
Adaptable	11	1	4	6	1	6	0	29	9%
Accessible	26	3	5	6	1	9	3	53	16%
Varied	5	0	1	0	0	2	0	8	2%
Interactive	7	0	2	2	1	5	1	18	5%
Conducive	17	1	3	2	1	6	3	33	10%
Environmentally friendly	14	1	3	4	1	5	2	30	9%
Safe and secure	21	1	3	4	1	6	3	39	12%
Suitable for information technology	26	2	5	7	1	7	1	49	15%
Aesthetics	7	1	0	2	12	0	0	22	7%
Total	**159**	**13**	**30**	**36**	**20**	**57**	**17**	**332**	

67% of respondents claim that the university library architecture plays the role of learning centre, similarly, New information and communication technology and Academic library as a place for social capital combination, (49%) amount to about half of Trends befitting the present design and use of University library while accessible, functional and suitable for information technology combination (46%) form crust of the characteristics that best describes the architectural design. Therefore, the nature of university library architecture in Edo State Nigeria cut-across as a learning centre, a place of social capital and new information technology that are accessible, functional and suitable for information technology.

Research Objective 2: To find out the problem of Library Staff due to University architectural designs of library

Table 4. Which of the following is a problem for library staff due to the architectural design of your library?

PROBLEM	UNIBEN	TAU	BIU	IOU	ESU	AAU	SAU	Total	Percent
Image and identity	1	0	2	0	0	3	1	7	2%
Flexibility and multi-functionality	4	2	2	0	0	6	1	15	4%
Order and orientation	3	0	0	1	0	5	1	10	3%
Accessibility	2	1	1	0	0	5	0	9	3%
Collection layout	2	1	4	1	0	6	0	14	4%
Shelving and display	2	0	3	3	0	4	1	13	4%
Furniture and fittings	17	1	4	0	0	5	0	27	8%
Service desk	3	0	5	2	0	3	0	13	4%
Marketing and branding	6	1	3	2	1	4	0	17	5%
Health and safety	10	1	1	2	0	6	0	20	6%
Lighting	11	1	5	1	0	7	1	26	8%
Acoustics	0	0	0	1	0	4	0	5	1%
Ventilation	26	1	3	2	0	4	0	36	11%
Heat	25	1	3	3	0	5	1	38	11%
ICT Cabling	5	0	3	0	0	7	0	15	4%
ICT Networking	9	2	2	2	0	4	0	19	6%
Cooling	12	1	2	1	0	4	0	20	6%
Wi-Fi	6	1	3	5	0	3	0	18	5%
Direction signs	6	2	1	2	2	5	0	18	5%
Total	**150**	**16**	**47**	**28**	**3**	**90**	**6**	**340**	

Ventilation and heat combination (22%) accounts for majority of the problems experience due to university library architectural designs by Library Staff others include lighting and furniture and fittings accounting for 8% respectively.

Research Objective 3: To find out the nature of spaces supported by University library architectural

Table 5. What types of spaces do you have included in your library?

SPACES	UNIBEN	TAU	BIU	IOU	ESU	AAU	SAU	Total	Percent
Entry foyer/lobby	17	4	4	5	0	5	0	35	6%
Print collections	6	2	5	6	1	6	1	27	5%
Canteen	28	0	1	2	0	3	0	34	6%
Cyber Café	11	0	3	2	0	5	1	22	4%
Multimedia collection	12	1	3	1	2	9	2	30	5%
Meeting rooms	24	1	4	7	0	6	0	42	7%
Group learning space	14	0	4	7	0	7	1	33	6%
Individual study space	22	3	4	5	2	6	1	43	8%
Training/teaching space	17	0	2	6	1	9	2	37	6%
Quiet study space	19	3	3	7	0	5	1	38	7%
Magazines/ newspaper	24	5	6	8	0	7	3	53	9%
Technology spaces	17	3	5	3	0	8	2	38	7%
Wireless access	16	1	5	5	1	4	1	33	6%
Marked spaces	3	0	3	1	0	5	0	12	2%
Exhibition spaces	12	0	6	6	0	3	1	28	5%
Theatre/ Theaterette	3	0	3	1	0	3	1	11	2%
Multimedia laboratory	6	0	3	3	2	6	1	21	4%
Dedicated spaces	4	0	2	1	0	2	0	9	2%
Students lounge area	10	0	4	6	0	5	0	25	4%
Video Game room	0	0	0	0	0	0	0	0	0%
Total	**265**	**23**	**70**	**82**	**9**	**104**	**18**	**571**	

Table 6. Statements which agree with the needs your library's architectural space supports

STATEMENTS	UNI BEN	T A U	B I U	I O U	E S U	A A U	S A U	To tal	Per cent
My library provides free physical access	18	3	5	7	1	9	1	44	13%
My library supports physically challenged persons	7	0	4	6	0	3	0	20	6%
My library provides research support	25	3	8	7	3	9	3	58	17%
My library promotes students learning and development	25	4	7	8	2	9	3	58	17%
My library provides free information support to less fortunate	11	1	4	3	0	7	1	27	8%
My library is a place to get books/videos/music	10	2	6	4	1	7	2	32	9%
My library provides social support	5	0	5	1	0	6	1	18	5%
My library provides access to electronic information remotely	19	0	6	8	1	5	2	41	12%
My library is a place for meeting/community events	5	0	0	1	0	1	0	7	2%
My library supports office work effectively	17	3	6	5	1	8	0	40	12%
Total	142	16	51	50	9	64	13	345	100%

Major spaces included in libraries in Edo state are magazines/newspaper (9%), individual study space (8%) others are meeting room, quiet study space and technology space accounting for 7% respectively. While statement supporting library architectural space are my library provides research support and my library promotes students learning and development yields 17% respectively followed by my library provides free physical access (13%), my library provides access to electronic information remotely and my library supports office work effectively both with 12% respectively. Consequently, the nature of space supported by university library architecture involves mainly magazines/newspaper, individual study spaces which provides research support, and promotes student learning and development.

Research Objective 4: To find out the functional spaces in University libraries in Edo State, Nigeria

Table 7. What are the three most functional spaces in your library?

FUNCTIONAL SPACES	UNIB EN	TA U	BI U	IO U	ES U	AA U	SA U	Tot al	Perce nt
Textbook collection	18	3	7	8	3	11	3	53	18%
Bindery	13	4	0	1	0	4	2	24	8%
Canteen	4	0	0	1	0	0	0	5	2%
Cyber Café	0	0	1	0	0	3	0	4	1%
Multimedia collection	3	0	0	0	1	1	0	5	2%
Meeting rooms	4	0	1	3	0	1	0	9	3%
Group learning space	2	0	1	3	0	1	1	8	3%
Individual study space	3	0	3	3	1	1	1	12	4%
Training/teaching space	0	0	3	2	0	0	0	5	2%
Quiet study space	7	2	2	3	1	0	0	15	5%
Magazines/ newspaper	9	3	7	7	0	2	2	30	10%
Return Area	2	1	2	1	0	0	0	6	2%
Technology spaces	1	0	3	1	0	0	0	5	2%
Wireless access	2	0	3	2	1	2	0	10	3%
Reference Area	19	1	4	1	0	0	0	25	9%
Exhibition spaces	0	0	2	4	0	0	0	6	2%
Theatre/ theaterette	0	0	1	0	0	0	0	1	0%
Multimedia laboratory	1	0	1	0	1	0	0	3	1%
Special collection	7	1	2	0	0	4	0	14	5%
Student lounge area	0	0	2	1	0	0	0	3	1%
Video Game room	0	0	0	0	0	0	0	0	0%
Circulation	22	5	7	5	1	5	2	47	16%
Cataloging	2	0	0	0	0	0	0	2	1%
Total	**119**	**20**	**52**	**46**	**9**	**35**	**11**	**292**	

Table 8. Why is this space working most successfully?

REASON FOR SUCCESSFUL SPACE	UNIB EN	TA U	BI U	IO U	ES U	AA U	SA U	Tot al	Perc ent
Aesthetics	1	1	0	2	0	1	0	5	5%
Accessibility	18	3	4	6	0	7	1	39	39%
Attraction	3	0	1	5	0	0	0	9	9%
Service	23	4	4	6	3	4	3	47	47%
Total	**45**	**8**	**9**	**19**	**3**	**12**	**4**	**100**	

The three most functional spaces in libraries in Edo state are Textbook collection (18%), followed by Circulation (16%) and magazines/newspaper (10%). The reasons for the successful utilization of these spaces are mainly for services (47%) and accessibility (395). Therefore the functional spaces in universities library Edo state are essentially, Textbook collection, Circulation and magazines/newspaper and the successes attributed to the usefulness of these spaces are evidently due to the services rendered and accessibility to these spaces.

Research Objective 5: To find out the least functional spaces in University libraries in Edo State, Nigeria

Table 9. What are the least functional spaces in your library?

LEAST FUNCTIONAL SPACES	UNIB EN	TA U	BI U	IO U	ES U	AA U	SA U	Tot al	Perc ent
Textbook collection	4	0	1	3	0	3	1	12	5%
Bindery	5	0	5	7	2	5	1	25	10%
Canteen	10	1	4	3	2	4	3	27	11%
Cyber Café	5	2	1	1	2	1	1	13	5%
Multimedia collection	4	1	2	2	0	1	1	11	5%
Meeting rooms	8	0	1	2	0	2	2	15	6%
Group learning space	6	1	2	2	0	1	2	14	6%
Individual study space	15	1	1	0	0	1	0	18	7%

Training/teaching space	3	1	0	0	0	2	0	6	2%
Quiet study space	7	0	1	0	0	1	1	10	4%
Magazines/ newspaper	0	2	1	3	1	1	0	8	3%
Return Area	9	0	1	2	0	2	0	14	6%
Technology spaces	3	3	0	2	0	2	0	10	4%
Wireless access	7	0	0	2	0	1	0	10	4%
Reference Area	2	1	2	7	1	2	1	16	7%
Exhibition spaces	3	0	1	3	0	0	0	7	3%
Theatre/ theaterette	1	0	2	1	0	1	0	5	2%
Multimedia laboratory	0	0	1	0	0	0	0	1	0%
Special collection	1	0	0	2	0	0	0	3	1%
Student lounge area	2	0	1	1	0	0	0	4	2%
Video Game room	4	0	3	1	0	0	0	8	3%
Circulation	4	0	0	1	0	1	0	6	2%
Total	**103**	**13**	**30**	**45**	**8**	**31**	**13**	**243**	

Table 10. Why theses spaces least successful?

REASONS FOR LEAST SUCCESSFUL SPACE	UNI BEN	TAU	BIU	IOU	ESU	AAU	SAU	To tal	Perc ent
Poor design	13	1	5	2	1	6	0	28	37%
Congestion	3	0	2	1	0	2	3	11	15%
Lack of access	17	2	1	2	0	2	0	24	32%
Aesthetics	0	1	0	2	0	0	0	3	4%
Marked space	2	0	1	2	2	1	1	9	12%
Total	**35**	**4**	**9**	**9**	**3**	**11**	**4**	**75**	

The least functional spaces in university libraries in Edo state are Canteen (11%) and Bindery (10%). The reasons adduced for the least functional spaces are poor design (37%) and lack of access (32%). Thus the least functional spaces in university libraries in Edo state are Canteen and Bindery which is due to poor design and lack of access

Research Objective 6: To find out the extent to which University library Architecture contributes to the librarian's effective delivery

Table 11. The level which your library architecture adds the most value to you.

VALUE OF LIBRARY ARCHITECTURE	UNI BEN	TA U	BI U	IO U	ES U	AA U	SA U	To tal	Per cent
My library design helps me in social bonding	2	1	1	2	0	1	0	7	7%
My library design helps me in official integration	7	1	0	3	0	3	0	14	14%
My library design helps me in educational mentoring	7	1	2	3	0	3	0	16	16%
My library design helps me in information research	28	4	7	9	3	6	3	60	62%
Total	**44**	**7**	**10**	**17**	**3**	**13**	**3**	**97**	

Table 12. The level which it helps your effectiveness in your role as a librarian

LEVEL OF SATISFACTION	UNIB EN	TA U	BI U	IO U	ES U	AA U	SA U	Tot al	Perce nt
Satisfied	11	0	1	9	0	5	2	28	39%
Partially satisfied	15	4	4	1	0	5	0	29	41%
Not satisfied	3	1	3	1	3	2	1	14	20%
Total	**29**	**5**	**8**	**11**	**3**	**12**	**3**	**71**	

The level which library architecture adds value to respondents were essentially, that, my library design helps me in information research (62%) while the level effectiveness of librarian roles shows that majority are partially satisfied (41%). The extent to which university library architecture contributes to the librarian effective delivery suggest that the library designs helps in information research, though majority are partially satisfied.

5. Conclusion
If libraries are to remain dynamic, the spaces that define them and the services they offer must continually stimulate users to create new ways of searching and synthesizing materials. There is no question that almost all the library functions

being planned for today will need to be reconfigured in the not-too-distant future. While certain principal design elements—such as the articulation of the perimeter wall, the introduction and control of natural light, and the placement of core areas for stairs, toilets, and heating, ventilation, heating and air conditioning—will remain relatively constant, the majority of space must be capable of adapting to changes in use. If this is to happen, a number of fundamental considerations must be addressed such as physical remodelling.

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