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Ready or not: The state of makerspace in University Libraries in Delta and Edo State, Nigeria

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Abstract

Makerspaces at university libraries in Delta and Edo, Nigeria, were explored in this study. The study used a descriptive survey design. A total of 127 librarians from libraries in Delta and Edo states participated in the research. The Census Sampling Technique was chosen in this study since it is often appropriate for a manageable population size; hence, the whole staff of 127 librarians at Nigeria's state universities was utilized. A systematic questionnaire was utilized to obtain data from respondents. The questionnaire responses were analyzed using descriptive statistics (frequency, percentage, and mean) to determine the answers to the study questions. The findings indicate that librarians have a favorable attitude toward makerspaces when given a chance. Additionally, the data indicated that university libraries in Delta and Edo States, Nigeria lack the organization and infrastructure necessary to accommodate Makerspace. The findings indicate that the barriers to fully integrating makerspace into university libraries include the lack of space for the establishment of a makerspace, makerspace equipment's exorbitant price, erratic power supply, a scarcity of people with the requisite expertise to deploy makerspaces, conventional librarians have an unfavorable view of makerspaces, too many maintenance issues associated with makerspace equipment, and noise issues associated with makerspace. The study demonstrates that university libraries in the Delta and Edo States, Nigeria, are not yet prepared to offer makerspace services. The study recommended that library and university administration provide the structure and facilities necessary for the successful integration of makerspaces into university libraries, and that library administration should encourage the creation of a supportive atmosphere for the successful integration of makerspaces into university libraries.

Keywords: Makerspace; Readiness, University Libraries; Delta State; Edo State; Nigeria.

Introduction

Libraries are used by librarians, faculty, staff, students, and researchers to fulfill their institution's instructional, research, and recreational needs. To achieve the aforementioned responsibilities, university libraries offer services and acquire a diverse range of information resources aimed at addressing their clients' information demands. University libraries provide user-centered services and information resources that are matched with the parent institution's curriculum. Information and communication technology progresses, university libraries automate their services to boost users' access to current services and resources while also eliminating time barriers due to access being possible at any time[1].

To attract and retain patrons, university libraries are undergoing a series of disruptive innovations that are altering their operational norms and practices. Previously, libraries were believed to be places where talking, standing, and moving were discouraged in order to minimize noise and distraction. It is becoming more and more common for libraries to create areas where patrons may work on their skills and knowledge while also having fun, enjoying themselves, and unwinding. Librarians are establishing "makerspaces" within their libraries for collaboration, practical activities, and learning. New library trends are emerging that emphasize boosting physical library visits, attracting users, and promoting the library's dynamic study and learning environment to the general population[2]. Developing makerspaces for university libraries is one strategy that has gained momentum in attracting users and enabling autonomous study, research, and enjoyment in the twenty-first century[3].

All ages are welcome to use makerspaces to pursue their passions, acquire new skills, and develop their creative abilities using both physical and digital equipment and materials. This is what Weebly calls a "makerspace[4]." University libraries are actively creating makerspaces for hands-on activities to assist students enhance their abilities in many industries. This novel approach has been quickly adopted by academic libraries worldwide[5,6]. It's rare to find a study on the state of Nigerian university libraries that includes a makerspace. An investigation of the state of makerspaces at libraries in Nigerian universities in Delta and Edo states aims to fill a knowledge vacuum and act as a guide for future studies.

Objectives of the Study: The study was focused on the following objectives: i. Examine librarians' perception of

makerspace in university libraries in Edo and Delta State. ii. To ascertain if the university libraries have the structure and facilities to incorporate makerspace. iii. Determine the challenges affecting the full incorporation of makerspace in university libraries.

Research Questions: The study provided answers to the following research questions: i. What is librarians' perception of makerspace in university libraries in Edo and Delta State? ii. What are the structures and facilities in place to incorporate makerspace in university libraries? iii. What are the challenges affecting the full incorporation of makerspace in university libraries ?

Literature Review: The review of the literature was done in line with the research objectives of the study.

Librarians' Perception of Makerspace in University Libraries: There was an investigation on a suburban school district's deployment of makerspaces. District and school authorities were found to be interested in long-term planning to embrace makerspace to assist its users in developing skills and gaining a more in-depth grasp of the technology used in makerspaces[7]. The attitudes of library workers regarding makerspaces was assessed and found that it will assist library users acquire new skills, according to the results of the survey. Those who believed that makerspaces will promote student collaboration are behind those who believe that makerspaces will improve student cooperation. A minority of respondents, however, question the value of makerspace, claiming that libraries can have an impact in other ways and that they have more pressing issues to deal with. The results indicated that library personnel value makerspace, with an average mean of 2.94 and a criteria mean of 2.50[8]. A survey was conducted on makerspace attitudes. According to the findings, 87 percent of public library librarians believed that introducing and installing makerspace in public libraries is necessary because there is a need for diversification of the library's role. Thirteen percent of those who said they didn't need it cited a lack of space, equipment, workload issues, and personnel limitations as justifications. Information professionals have a good attitude regarding makerspace. The report also reveals that the study's respondents are eager to embrace innovation[9].

The Structure and Facilities to incorporate Makerspace by University Libraries: Depending on the amount of space and funds available, libraries' makerspaces can take on a variety of shapes and sizes. As part of his research on academic libraries and makerspaces, the stages involved in establishing a makerspace was analysed. The researcher drew attention to the startup's structural and technological requirements. All the essential equipment and facilities must be available in a well-ventilated, visually pleasing makerspace[10]. Before contemplating any other machines for the makerspace, a 3D printer was considered a must-have tool. As indicated by research of the classic makerspace, there is no predetermined list of tools or technologies that must be offered as long as individuals may design and build their artifacts[11]. Following the completion of their research, Wong and Partridge discovered that laser cutters, CNC routers, PCB milling machines and 3D printers were among the items discovered in Australian university libraries, as were computers, electronics, soldering equipment, power tools, hand tools, and supplies for making crafts[6]. The 3D printer was the most often mentioned piece of equipment, followed by the laser cutter. A research on how to stay relevant in today's rapidly evolving makerspace movement, it was found that while 3-D printers and other prototyping technology are important and vital to today's creative culture, additional facilities and programs supporting alternative styles of making across disciplines should be studied and appreciated[12]. In relation to production, computers, large-format printers, sewing machines, and performance stages can all be considered.

Challenges affecting the full incorporation of makerspace in University Libraries: Several obstacles were found, such as a shortage of library space, restricted library financing for facilities for creative endeavors, inadequately qualified staff in charge of the makerspace and its activities, and safety issues for its patrons, such as worries[3]. Due to a lack of library infrastructure repair, there were numerous power outages that kept people away from the makerspace. The cost of establishing a makerspace at a university library has been under discussion for some time. When you just have a little budget to work with, it might be tough to afford high-end 3D printers, laptops, computers, laser cutters, propellers, and sewing machines like these[13]. Makerspaces encounters three common challenges. The equipment that may be purchased is constrained by financial limits, and copyright, accountability, and ownership are legal considerations[14]. Running makerspaces is tough since there are not enough competent people[15]. 2019 saw an investigation on Nigerian university libraries' makerspaces[16]. As a result of these investigations, it was determined that the library's physical space was inadequate, its power supply was unstable, and its equipment maintenance, bandwidth, hardware, and software costs were high.

Methodology

A descriptive survey design was utilized in this investigation. A total of 127 Nigerian university and public library employees from the states of Delta and Edo participated in the study. In this study, the Census Sampling Technique was adopted since it is frequently suited for a manageable population size; hence, the whole population of 127 librarians was used. A structured questionnaire was used to collect data from respondents. To identify the answers to the research questions, the questionnaire responses were examined using descriptive statistics (frequency, percentage, and mean).

Results and Discussion

This section presents the questionnaire response rate, analysis of the demographic representation of the respondents, and

answering the research questions. Analysis of the library personnel demographic information are mention in tables.

Table-1: Questionnaire Response Rate.

Number of Questionnaires Administered	Number of Questionnaire Returned	Percentage of Questionnaire Returned
127	118	93%

A total of 127 persons received the questionnaire, with 118 (93%) of them returning it. The study's response rate (93%) is deemed satisfactory. Research having a response rate of less than 60%, according to Johnson and Owens can only be approved for publication in "rare" situations. In most research, a return rate of 60% is considered acceptable[17].

Table-2: Number of Respondents from the University Libraries

Name of University Library	Librarians' Population	Percentage (%)
Federal University of Petroleum Resources, Effurun, Delta State.	8	7
Nigeria Maritime University, Okerenkoko, Gbaramatu, Delta State, Nigeria	8	7
John Harris Library, University of Benin, Edo state,	12	11
Delta State University, Abraka, Delta State	16	14
University of Delta, Agbor	6	5
Dennis Osadebe University, Asaba	4	3
Delta State University of Science and Technology, Ozoro.	4	3
Ambrose Ali University, Ekpoma, Edo State	8	7
Edo University Iyamho, Etsako West, Edo State,	5	4
Edwin Clark University, Kiagbodo, Delta State.	4	3
Novena University, Ogume, Delta State.	7	6
Western Delta University, Oghara, Delta State.	5	4
Micheal and Cecilia Ibru University, Agbarha-Otor, Delta State.	5	4
Igbenedion University Okada, Edo State	7	6
Wellspring University, Egbuobanose, Edo State	6	5
Samuel Adegboyega University, Ogwa, Edo State	6	5
Benson Idahosa University, Benin City, Edo State	7	6
Total	118	100%

Table-2 shows how many library staff from each university took part in the study. There were more library personnel 16(14%) from Delta State University, Abraka. This is closely followed by those from University of Benin, Edo State 12(11%), Federal University of Petroleum Resources, Effurun, Delta State, Nigeria Maritime University, Okerenkoko, Gbaramatu, Delta State, Nigeria, and Ambrose Ali University, Ekpoma, Edo State-18(7%), Novena University, Ogume, Delta State, Novena University, Ogume, Delta State and Benson Idahosa University, Benin City, Edo State-7(6%), University of Agbor, Wellspring University, Egbuobanose, Edo State, and Samuel Adegboyega University, Ogwa, Edo State- 6(5%), Edo University Iyamho, Etsako West, Edo State, Western Delta University, Oghara, Delta State and Micheal and Cecilia Ibru University, Agbarha-Otor, Delta State-5(4%), Dennis Osadebe University, Asaba, Delta State University of Science and Technology, Ozoro and Edwin Clark University, Kiagbodo, Delta State - 4(3%) respectively.

Table-3: Gender of the Respondents.

Gender	Frequency	Percentage (%)
Male	66	56%
Female	52	44%
Total	118	100

From Table-3, it can be seen that there are 66(56%) male library personnel, while there are 52(44%) female library personnel. This means that there is more male library personnel than their female counterparts in the study.

Research Questions: Answering of the Research Questions are mention are mention in following three question.

Research Question 1: What is librarians 'perception of makerspace in university libraries in Edo and Delta State?

Table-4 shows that with an aggregate mean of 3.19 which is greater than the criterion mean of 2.50, in conclusion, librarians have a favourable view on Makerspace at their university library, if the enabling environment to execute the innovation can be supplied.

Research Question 2: What are the structures and facilities in place to incorporate makerspace in university libraries?

From Table-5, it is glaring that libraries in Edo and Delta States lack the necessary infrastructure to accommodate a Makerspace. It is necessary to note that before Makerspace can be incorporated in the university libraries' understudy the necessary structure, space and facilities need to be made available.

Table-4: Librarians' Perception of Makerspace in University Libraries in Edo and Delta State.

Librarians' Perception of Makerspace	VHE	HE	LE	VLE	Mean
I am ready to incorporate Makerspace to increase my library patronage.	85	16	12	5	3.53
I am ready to sell the idea of Makerspace to my Management.	78	22	8	10	3.42
I will be glad to guide users in using Makerspace.	82	12	10	14	3.37
I feel makerspace would enable libraries to meet up with their mandate.	68	26	12	12	3.27
I will be ready to agitate for the creation of space for Makerspace in my university library	56	32	24	6	3.16
I will be ready to train users on the use of Makerspace	48	36	22	12	3.02
I am willing to showcase end products emanating from my library Makerspace	42	28	32	16	2.81
I will be ready to put all safety precautions into consideration for Makerspace Setup	44	20	46	8	2.85
I am ready to Incorporate Makerspace for boosting the learning needs of my Users	78	16	12	12	3.36
Aggregate Mean					3.19
Criterion Mean					2.50

Note: VHE- Very High Extent; HE- High Extent; LE- Low Extent; VLE- Very Low Extent.

Table-5: Structures and Facilities in Place to incorporate Makerspace.

Structures and Facilities for Makerspace Setup	Available	Not Available	Total (%)
There is the availability of Building for Makerspace in your University Library	-	118	118(100%)
There is the availability of Space within your University Library for Makerspace	12(10%)	106(90%)	118(100%)
3D Printing, Scanning, and Design Facilities	22(19%)	96(81%)	118(100%)
CNC Machines	-	118	118(100%)
Laser Cutters	-	118	118(100%)
Digital Fabrication Tools	-	118	118(100%)
Craft Facilities	-	118	118(100%)
Sewing Machines	-	118	118(100%)
Toys and Robots	-	118	118(100%)
Welding Tools	-	118	118(100%)
Software for Programming	26(22%)	92(78%)	118(100%)
Computers	118	-	118(100%)
audio and visual devices	98(83%)	20(17%)	118(100%)
Soldering Equipment	-	118	118(100%)
Table and Chairs	118	-	118(100%)
Safety Equipments	62(53%)	56(47%)	118(100%)

Research Question 3: What are the challenges affecting the full incorporation of makerspace in university libraries?

Table-6: Challenges affecting the full incorporation of makerspace in university libraries.

Challenges Affecting Makerspace Incorporation	Agree	Disagree	Total (%)
No space or structure for Makerspace set up in my University Library	118(100%)	-	118(100%)
Makerspace equipment is too expensive to purchase	118(100%)	-	118(100%)
Noise issues associated with Makerspace	78(66%)	40(34%)	118(100%)
Insufficient manpower with the skillsets to implement Makerspace	94(80%)	24(20%)	118(100%)
Too many maintenance issues associated with Makerspace Equipments	82(69%)	36(31%)	118(100%)
High Cost of Librarians and Users Training	70(59%)	48(41%)	118(100%)
Issues associated with the Security of the Makerspace facilities	66(56%)	52(44%)	118(100%)
Erratic power supply	108(92%)	10(8%)	118(100%)
Users safety issues associated with Makerspace Establishment	92(78%)	26(22%)	118(100%)
The negative perception of Traditional Librarians about Makerspace	84(71%)	34(29%)	118(100%)
Makerspace can cause a distraction to users	36(30%)	82(70%)	118(100%)
Insufficient Bandwidth	74(63%)	44(37%)	118(100%)

A makerspace is not feasible in university libraries because of the lack of space, the high cost of the necessary equipment, the unstable power supply, and the scarcity of people with the necessary skills to carry out the project. In addition, traditional librarians have a negative view of makerspaces, and there are too many maintenance issues and noise concerns associated with the makerspace equipment. A makerspace's users will not be distracted, according to those who responded.

Research Findings: The findings of the study are highlighted below:

Librarians' Perception of Makerspace in University Libraries in Edo and Delta State: It was found that the aggregate mean of 3.19 was more than the criterion mean of 2.50, indicating that makerspaces are well-liked by librarians at their university library. As previously reported, the majority of library employees had a good view of makerspaces with an average mean rating of 2.94 and a criteria rating of 2.51[8]. Information professionals' positive opinions on makerspaces allow the innovation to be deployed at universities[9].

Structures and Facilities in Place to incorporate Makerspace: In Edo and Delta states, university libraries lack the essential infrastructure and resources to host a makerspace, according to the findings of the study. Because university libraries lack the necessary space and facilities, makerspaces cannot be built or deployed. The discovery of a wide range of makerspaces in Australian university libraries contradicts their findings[6]. Laser cutters, CNC machines, PCB milling machines, and 3D printers are among the equipment available. Laser cutters and 3D printers are the most often utilized technologies in university libraries.

Challenges affecting the full incorporation of makerspace in University Libraries: Findings from a recent study show that the most common obstacles to integrating makerspace into university libraries includea scarcity of available space, high costs of makerspace equipment and unstable power supply, execution is hindered by a lack of qualified personnel, a negative perception of makerspace by traditional librarians, too many maintenance issues with makerspace equipment, and noise issues associated with makerspace. The following factors make establishing a makerspace challenging: a scarcity of available space, a scarcity of funds for libraries, the prohibitively expensive nature of makerspace facilities, inability to manage the makerspace due to lack of skilled employees, safety concerns for users, an unfavorable attitude about makerspace held by conventional librarians, an absence of library infrastructure maintenance culture, and Users may experience annoyance as a result of the amount of time they spend in a makerspace[3.]

Conclusion

A new chapter in academic library services is being written by makerspaces in the digital era. In a makerspace, you're free to try new things and learn new skills on your own. Delta and Edo universities were polled to assess how successfully their libraries implemented makerspaces. Library staff in the states of Delta and Edo are open to the notion of setting up Makerspaces at their institutions. That is to say, makerspaces will be established at university libraries as long as there is sufficient space, equipment, and a setting that is conducive are provided. There is currently no evidence that any of the university libraries under consideration have the requisite space and infrastructure to begin providing makerspace services. Makerspaces at university libraries require a dedicated area and specialized tools. In order to fully integrate makerspace into university libraries, it must overcome numerous obstacles, including a lack of available floor space, the high cost of makerspace equipment, unstable power supplies, a scarcity of skilled workers, the traditional librarians' negative view of makerspace, the numerous maintenance issues with makerspace equipment, and the noise issues associated with makerspace. Research shows that university libraries in Delta and Edo States are not yet structured and prepared to provide makerspace services. According to the conclusions of this study, the researcher suggests that: i. Library and university administration should offer the infrastructure and facilities for the effective implementation of a Makerspace in the library. ii. In order for a university library's Makerspace to be a success, the library's administration must provide the necessary support. iii. Librarians should receive enough training in Makerspace operations so that they may better support their customers.

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