Let Us Make: Interrogating Personnel's Perception towards Makerspace in a Nigerian University Library

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ABSTRACT

Makerspace offers an innovative way for university libraries to render services and achieve its core objectives. However, there is low level of adoption in Nigerian university libraries, hence the need to investigate the personnel's perception towards makerspace as an innovative learning platform. To achieve this, the descriptive research design was used to elicit data with the aid of a structured questionnaire, from the 96 library personnel in John Harris Library, University of Benin. Of the 96 copies of questionnaire distributed, 68 copies were returned and analyzed using descriptive statistics. The results showed that the library personnel were familiar with makerspace even though they still require more information about it. Also, that makerspace gives students the opportunity to acquire ew skill and enhances collaboration among learners. Moreover, the study revealed that budget constraints, high cost and maintenance of equipments, erratic power supply and lack of staff training are some of the perceived challenges to makerspace implementation. Consequently, the study revealed that university libraries should strategize on how to increase allocation of funds, organize makerspace webinar for personnel, ensure stable electricity supply and create a dedicated space for makerspace in the library. In conclusion, makerspace will provide students with the technological exposure and creative abilities required for the future, and as such effective planning should be made for its deployment and sustainability in Nigerian university libraries.

1. Introduction

Over the years, university libraries have remained central to the learning endeavor of students as reflected in their objectives for establishment, which is to support the teaching, learning and research activities of their parent institution. However, as civilization makes possible, there is a paradigm shift in learning culture of university students and resultant change in their expectation from libraries

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towards meeting their learning needs. Consequently, university libraries are adopting new approaches to sustain relevance and provide a robust learning platform for users. This precipitated the adoption of makerspace in university libraries in developed and developing countries like Nigeria. This makerspace according Chicago Public Library (2019) provides library users with novel opportunity to explore and learn with tools for personal development.

University library's quest to fulfill their objectives and blend with the current innovative trend occasioned the redesigning of library's space to accommodate a dedicated space for making in these libraries. Makerspace according to Aiyeblehin, Onyam, and Akpom (2018) is a place where people create, collaborate and share knowledge and resources in order to birth creativity and innovation. However, the concept of makerspace transcends beyond just having a conducive space, to include availability of the right tools for making, makers and mentors. The advent of makerspace in the university library provides a lucrative platform and opportunity for learning. This is because makerspace provides a conducive atmosphere for collaborative learning (Oyewole & Igbinovia, 2017), while making is in itself considered a lifelong learning quest (Julian & Parrott, 2017). Despite the relevance of makerspace in stimulating collaboration and learning among students, how well university libraries have adopted this innovation especially in developing countries like Nigeria, is a discourse open for scholarly investigation.

The adoption of makerspace in Nigeria university libraries have been investigated to the extent of examining the concept and perceived benefits (Okpala, 2016). The author advocated for makerspace in Nigerian academic libraries in order to build community of collaborators, introduce students to new technology and boost the library's image. However, Kalu, and Chinyere (2019) in an empirical investigation of makerspace as an emerging trend in Nigerian academic libraries asserted that academic libraries in Nigeria do not have makerspace neither is there any plan to establish it in the nearest future. Therefore, makerspace have not received adequate deployment in Nigerian universities, regardless of its immense benefit especially as it helps fulfill their learning objective.

The deployment of makerspace in Nigerian universities could be influenced by several factors including its perceived benefits and challenges or difficulties to its implementation and utilization. This assertion is informed by the technology acceptance model (Davis, Bagozzi, & Warshaw, 1989), where individuals' attitude towards a system and the behavioural intention to use that system could be predicted by the degree to which the system will be of benefit to the individual and the ease or challenges associated with using the system. Consequently, among other things, this study investigated the perceived importance of makerspace and challenges associated with implementing makerspace in Nigerian university libraries using John Harris library as a case study.

John Harris Library (JHL) is the main library of the University of Benin (UNIBEN) which is a federal university in Edo State, Nigeria. The university was founded in 1970 as an Institute of Technology, and later became a full-fledged university in 1971. Currently, the university has thirteen faculties and several departments, institutes and units, with student enrollment of over 40,000 both in full-time and part-time programmes (University of Benin, 2020). The John Harris library serves as the intellectual hub of the university, with the objective of providing information resources and services to members of its parent institution. According to Obasuyi (2020), the library has two E-libraries with about 228 computers with Internet connectivity, several electronic databases, over

211,000 current books, 344 titles of journals across numerous subjects, and audio-visual materials. The JHL has a sitting capacity of 4,700 and branch libraries in its faculties.

1.1 Statement of the Problem

Review of literature has shown the relevance of makerspace in university libraries. Okpala (2016) specifically made a case on the perceived benefits of makerspace in university libraries. However, there tends to be a discrepancy between what is and what ought to be in terms of makerspace deployment in Nigerian university libraries. With reference to John Harris Libraries, preliminary investigation revealed that the library has adequate space and human resources to deploy makerspace. However, there is yet to be a functional makerspace and subsequent making as a contemporary learning approach in JHL.

According to Curry (2017), there is scarcity of in depth research on makerspace in academic libraries, yet questions keep arising on the future roles of libraries beyond conventional practices. Consequently, there is a dearth of empirical investigation on makerspace in university libraries especially in terms of unearthing strategies that could enhance the implementation of makerspace in Nigerian university libraries. Therefore, this study was conducted to provide empirical solution to the identified problems.

1.2 Objectives of the Study

- Ascertain the library personnel's familiarity with makerspace
- Ascertain how library personnel heard about makerspace
- Determine the perceived importance of makerspace
- Examine the perceived challenges to establishing makerspace in university library and
- Examine the perceived strategies to the effective implementation of makerspace in university libraries.

2. Literature Review

According to Wight (2015), makerspace hinges on the maker movement which is built upon constructivism ideology that emphasizes hands-on learning, through building and making. This gives students control of the learning process and instigates in them an entrepreneurial spirit, spur self learning, collaboration among students with different learning styles and help build a sense of community. Feinstein, DeCillis, and Harris (2016) noted that makerspace are places where people can design and invent among a commodity of makers. They further noted that makerspace fosters creativity among students and that while students engage in making, with the cycle of attempting and failing until success is achieved, they become risk-takers, innovative and persistent in dealing with life issues. Makerspace has received attention in the educational sector including libraries, as an innovative and participatory way of learning (Wong & Partridge, 2016).

One of the missions of every university library is to provide users with information resources

and technologies that are not affordable to them as an individual, which is consistent with the goal of makerspace in libraries (Burke, 2015). Thus, university libraries are expected to establish makerspace to provide an avenue for their patrons to access materials and technologies. While some university libraries already exist without makerspace, Wong and Partridge (2016) admonished that university libraries make renovations, there should be strategic plans to implement makerspace in the libraries. However, how familiar library personnel are with the concept of makerspace is open to scholarly discourse.

According to Aiyeblehin, Onyam, and Akpom (2018), lots of "libraries in developed countries have well-developed makerspace programs and facilities" (p.24). By implication, librarians in developed countries are well familiar with the concept and operations of makerspace. They are so familiar with makerspace due to several makerspace trainings organized for library staff to explore emerging technologies (Groves, 2016). The familiarity of librarians with makerspace is crucial to its effective deployment and optimal utilization. The use of makerspace in libraries is of great learning significance and could change students' perception towards learning. As Buerkett (2014) affirmed that when students learn through making, it changes the way they perceive the world around them.

On the importance of makerspace to university libraries, Wang, Wang, Wilson, and Ahmed (2016) asserted that it provides students with the enabling platform for knowledge and skills acquisition through hands-on learning. This implies that makerspace is an innovative approach for university libraries to achieve their learning objectives. According to Johnson, Adams Becker, Estrada, and Freeman (2015), makerspace space provide an environment where students are free to experiment and make things individually and as part of a productive community. Thus, another importance of makerspace is reflected in its ability to make students independent learners as well as team players with the aim of achieving success. This correlates the assertion of Bagley (2012) that makerspace in libraries make students independent learners by teaching them how to think for themselves and creatively proffer innovative solutions to problems. By implication, students who have mastered the act of problem solving in a library makerspace will become solution providers in the "outside world". Bagley's position is supported by Uzezi, Joy, and Agbeniaru (2020) when they noted that makerspace offers an educational platform for experimental and collaborative learning and helping students discover their potentials through hands-on creation using combination of tools.

Moreover, makerspace in libraries exposes students to technology for creating and making. This was the position of Harris and Cooper (2015) when they opined that one of the missions of makerspace is exposure to new technologies and the development of related skills. This exposure to technology is crucial is equipping the students with life-skills that could be useful to them after graduation. This skill could make them entrepreneurs after graduation and consequently earning a living. In line with the aforementioned, Barrett et al. (2015) posited that makerspace encourages entrepreneurial activities and technology knowledge transfer. Thus, makerspace in university libraries equips students with the knowledge and skills required for a competitive future. However, with the glaring importance of makerspace in university libraries, there are still challenges that face the establishment of makerspace in libraries.

Uzezi, Joy, and Agbeniaru (2020) gave the challenges of makerspace in Nigerian libraries to include the lack of trained librarians to manage makerspace programmes, poor funding for adequate

structures and facilities, the tendency of making activities to create loud noise from equipments disrupting the expected serenity of a library, lack of maintenance culture towards equipments, and library personnel's resistance to innovation. On the challenges faced by makerspace in libraries, Dellot (2015) averred that regardless of the idealistic nature of Royal Society of Arts (RSA) towards making and makerpsace, issues like financial pressure and environmental issues cannot be ignored. The author further noted that other concerns include the sustainability of materials used for making, legal issues between creative commons and intellectual property rights, health and safety concerns (Dellot, 2015). The deployment of makerspace in university library is a long term goal and a project that requires strategizing. As part of this strategy, the library must ascertain where and how to fund the project. For example, the library makerspace at Curtin University and USQ funds its makerspace project from the resources available in the university as well as seeking assistance from grants, partnership and donations (Curtin University, Curtin Makers, 2015). Thus, while funding seems to remain a challenge common among libraries, there is need for libraries to look out for extra funding in order to successfully implement innovative ideas.

3. Methodology

The study adopted descriptive research design to gather data in a bid to ascertain library personnel's perception towards makerspace deployment in JHL. The structure questionnaire was used as a tool to elicit data from library personnel in JHL. A total of 96 library personnel comprising of both librarians and library officer constituted the population size of the study.

The study employed a structured questionnaire to elicit data from the respondents. The questionnaire consisted of five sections. Section A elicited information on the demographic distribution of the respondents to include year of professional experience, gender and designation. Section B elicited data on makerspace familiarity by the library personnel. This section was divided into an objective question on their familiarity with makerspace and how they heard about it. The section C of the instrument elicited data on the perceived importance of makerspace. Section D elicited data on the perceived challenges in establishing makerspace in university libraries while the last section E was on the strategies to effectively implement makerspace in the libraries. The items on each scale were generated based on related literature and the researchers' knowledge of the concept. The items were measured against a four point likert scale of Strongly Agree (SA), Agree (A), Disagree (D) and Strongly Disagree (SD), with scoring points ranging from 4 to 1 respectively.

In a bid to ensure face validity of the instrument, experts in the field of librarianship and emerging technologies vetted the questionnaire and make corrections accordingly. The corrections were effected to have an updated version of the questionnaire which was further subjected to reliability to ensure the internal coherence of the measuring scale. Consequently, 20 copies of the questionnaire were pretested using library personnel in Ambrose Alli University, Ekpoma. The cronbach alpha method was used to ascertain the reliability coefficient of the instrument which yielded 0.75 cronbach alpha.

A total of 96 copies of questionnaire were distributed and monitored to ensure optimal collection. Of the 96 copies distributed, 68 copies were retrieved and found usable which constituted 71%

return rate. The retrieved data were analyzed using descriptive statistics of frequency, percentage (%) and mean with the aid of statistical package for social sciences (SPSS).

4. Presentation of Results

This section presents the results of the analysis and the interpretation of the results using tables in accordance with the study's objectives.

The **Table 1** below shows the demographic distribution of the respondents, depicting that majority of them had a good amount of professional experience which makes them familiar with library issues. On the gender distribution of the respondents, there are more females than male in JHL though with a difference of 1.2%. In addition, majority of the respondents are library officers who possess diploma degrees in library and information science.

Table 1. Demographic Information

S/N	Years of Professional Experience	Frequency	Percentage(%)
1	0-5 years	18	26.5
2	6-10 years	8	11.8
3	11-15 years	24	35.3
4	16-20 years	6	8.8
5	over 20 years	12	17.6
	Gender		
1	Male	31	45.6
2	Female	37	54.4
	Designation		
1	Principal Librarian	4	5.9
2	Senior Librarian	6	8.8
3	Librarian 1	8	11.8
4	Librarian II	2	2.9
5	Assistant Librarian	17	25.0
6	Library Officers	31	45.6

The majority of respondents noted on the **Table 2.1** below that they are familiar with the concept of makerspace. This implies that majority of the respondents can relate with issues raised with regards to makerspace and effectively communicate their perception towards makerspace accordingly.

Table 2.1 Familiarity with Makerspace

S/N	Familiarity with Makerspace	Frequency	Percentage(%)
1	Highly familiar	23	34
2	Familiar	25	37
3	Fairly Familiar	11	16
4	Not Familiar	9	13
	Total	68	100

The **Table 2.2** below shows that though a lot of the library personnel have heard of makerspace majorly through literature and on the Internet, majority of them still need more information on makerspace. This suggest that majority of the respondents with a mean score of 3.09 do not have sufficient information/knowledge on makerspace with can affect their perception towards the deployment of makerspace in university libraries.

Table 2.2 How Librarians heard about makerspace

S/N	Items	SA	A	D	SD	Mean
1	I have come across makerspace in literature/Internet	10	37	13	8	2.72
2	I have been taught makerspace technologies	7	12	40	9	2.25
3	I have heard about makerspace in the news	5	18	25	20	2.12
4	In a conference/workshop	9	24	28	7	2.51
5	I enrolled for Workshop on makerspace	4	0	46	14	1.97
6	I need more information on makerspace	27	26	9	6	3.09

The **Table 3** below shows that majority of the respondents perceived that makerspace will provide library users with the opportunity to learn new skills. This is closely followed by those who felt that makerspace will enhance collaboration among learners. However, the minority of respondents negate the importance of makerspace on the ground that libraries can make impact through other means and that the library has other pressing issues to attend to. With an average mean of 2.94 and a criterion mean of 2.5, the result shows that the library personnel perceive makerspace to be important in university libraries.

Table 3. Importance of makerspace in libraries

S/N	Items	SA	A	D	SD	Mean
1	Makerspace brings back our library users and will offer opportunity to market and showcase our new books, databases, journals, etc.	29	27	8	4	3.19
2	Makerspace offers users opportunity to acquire new skills	25	39	3	1	3.29
3	Makerspace enhances collaboration among learners	19	47	1	1	3.24
4	Makerspace will help project the library's image	18	35	13	2	3.01
5	Makerspace is not important because there are other ways to create impact and we have other pressing issues in the library	6	11	25	26	1.96
	Average mean = 2.94					

The **Table 4** below shows the perceived challenges makerspace will encounter in JHL. Majority of the respondents opined that budget constraint will hinder the establishment of makerspace in the library. This is followed by the high cost and maintenance of making equipments as well as erratic power supply that could impede use and likely damage equipments. The challenge with the least response from the respondents is the challenge of training users.

Table 4. Perceived Challenges of establishing/implementing a makerspace in libraries

S/N	Items	SA	A	D	SD	Mean
1	Lack of sufficient space	18	32	12	6	2.91
2	Budget issues – Not enough money to buy books let alone establish a makerspace	34	14	18	2	3.18
3	Lack of access to libraries that already have makerspace	12	27	22	17	2.65
4	The challenge of training the users	8	29	12	19	2.38
5	Security challenges – securing the technologies	8	39	14	7	2.71
6	Erratic power supply could damage the equipments	27	17	22	2	3.01
7	High cost and maintenance of equipments	25	31	8	4	3.13
8	Technophobia among library staff	17	17	18	16	2.51
9	Lack of money to sponsor library staff to training	23	25	18	2	3.01
10	Lack of ICT policy in the library, to guide the implementation process	13	23	29	3	2.68

On the strategies to enhance makerspace implementation in libraries, **Table 5** showed that majority of the respondents indicated librarians should be trained on makerspace and other technology related webinars. This is followed by the allocation of funds for makerspace given that makerspace establishment is a capital project in libraries. Also, as a strategy, the result reinforces the need to ensure stable electric power supply as some of the makerspace facilities will run on electricity.The strategy with the lowest indication by the respondents was asking for donations of equipments from philanthropists.

Table 5. Strategies to enhance makerspace implementation in libraries

S/N	Items	SA	A	D	SD	Mean
1	Applying for grants to NGOs, Fed. Govt, other funding bodies	26	26	15	1	3.13
2	Asking for donation of equipments from philanthropists	16	35	16	1	2.97
3	Sponsoring of librarians for maker workshops	20	46	2	0	3.26
4	Libraries organizing workshops and training programmes	16	49	3	0	3.19
5	Integrating Maker Education into the students' curriculum	22	43	3	0	3.28
6	Creating a space in the library for makerspace	23	45	0	0	3.34
7	Creating awareness programme on makespace movements and its benefits	26	42	0	0	3.38
8	Collaboration with other libraries that have implemented makerspace	20	36	8	4	3.06
9	Ensuring stable electric power	36	32	0	0	3.53
10	Allocation of funds for makerspace in university libraries	37	31	0	0	3.54
11	Nigerian Library Association should float a conference on makerspace in libraries	26	40	2	0	3.35
12	Librarians should participate in makerspace and IT-related Webinars	41	26	1	0	3.57

5. Discussion of Findings

The study found that library personnel are familiar with the concept of makerspace though they require more information and knowledge about it. This is in alignment with the study carried out by Kalu and Chinyere (2019), on the advocacy and domestication of makerspace in Nigeria. The result of the study showed that library personnel are aware of makerspace as an emerging learning space in academic libraries. The need for academic librarians to be familiar with makerspace was also buttressed by Okpala (2016) when the author advocated for the need to organise online courses on makerspace in order to increase their knowledge level. This knowledge will enhance their ease of use of makerspace technologies which will in turn affect their level of acceptance and adoption of makerspace innovation. Online courses or webinar will equip librarians with knowledge of makerspace best practices, who will in return train and mentor users during making.

On the importance of makerspace in libraries, the study revealed that makerspace provides an opportunity for users to acquire new skills and enhance collaboration among learners. Hitherto, libraries are central to increasing the information and knowledge base of their users. However, with the introduction of makerspace to libraries, users can now learn new skills that could be useful to them in their educational and vocational pursuit. This supports the assertion of Pisarski (2014) that makerspace is a place to learn new skill and become a creator through access to specialized equipments. By revealing that makerspace prompt collaboration among learners, the study supports Burke (2015) who affirmed that makerspace in academic libraries provide learning skills and collaborati

on between peers, acceptance of idea sharing and exchanging information. Thus makerspace helps the learners to maximize individualism while encouraging collaboration (Schrock, 2013). Thus, in line with previous literature, the library personnel perceive makerspace to be important and this should spur its deployment in university libraries

On the perceived challenges makerspace could encounter in its deployment in university libraries, the study revealed that budget constraints, and high cost and maintenance of equipments as the major challenges of makerspace. The problem of funding has lingered as a challenge facing libraries all over the world. In addition, makerspace is a project that requires adequate funding due to its nature and this funding seems lacking in university libraries especially of developing countries like Nigeria. In investigating possible challenges to creating makerspace in Nigerian libraries, Okuongha e (2019) averred that inadequate funding is a global challenge to the deployment of new technologies and innovations such as makerspace. The cost implication for makerspace equipments makes adequate funding a critical challenge and issue of consideration in deploying makerspace. This was also the concern of Curry (2017) who opined that makerspace support in academic libraries should greatly consider the high cost of new equipments for makerspace like a quality 3D printer. These equipments is not only costly to purchase but also costly to maintain. Also, the study revealed that erratic power supply poses a challenge to makerspace deployment as most of these equipment runs by electricity. Okuonghae (2019) further noted that Incessant Power Outage affects makerspace in Nigerian libraries as such inventions have been set aside because of epileptic power supply.

The study further revealed that as strategies to enhance makerspace implementation in University libraries, the library personnel should participate in makerspace webinars and conferences, ensuring stable electricity supply, adequate funds should be allocated, the library should dedicate space in the library, among other things. Strategizing for makerspace in university library is crucial to its successful implementation, thus a plan of action must be drafted and followed religiously. As best practice, Wong and Partridge (2016) advocated for planning and strategizing for makerspace. As a strategy to implementing makespace in university libraries, Altman et al. (2015) noted that libraries that desire to deploy makerspace must be responsive to funding. Thus, strategizing for makerspace implementation basically encompasses setting up structures that address the issues and challenges of makerspace space, for sustainability.

6. Conclusion, Recommendations and Limitations of the Study

University libraries in Nigeria are designed to assist their parent institution achieve its objective by providing resources and services in support of teaching, learning and research. However, universities as higher institution of learning are further charged with the all round development of the students and university libraries through the deployment of makerspace will be rightly position to respond to this charge. Makerspace in university libraries provides students with the platform for technological exposure where they can collaborate to create, hereby inciting an entrepreneurial spirit in them. Regardless, of their familiarity with this innovative trend, the personnel of John Harris Library still requires more information and knowledge, as the mission of makerspace must be built around

proper understanding by the personnel. However, some peculiar issues faced with libraries especially in developing countries like Nigeria impede the successful implementation of makerspace initiative. These issues like poor funding, erratic power supply and poor maintenance culture should be address at the level of planning for a makerspace deployment. Consequently, libraries must strategize and effectively set up modalities for the successful implementation and smooth running of the makerspace project in Nigerian university libraries.

Based on the findings of the study and conclusion, the following are recommended:

- University libraries in Nigeria should form a Higher Education Makerspace Initiative aimed at creating awareness on makerspace and proffering solutions to the challenges of its deployment.
- Nigerian universities' management and the Nigerian Library Associations (NLA) should organise free trainings, conferences and webinars on makerspace in a bid to increase the knowledge state of library personnel with regards to makerspace.
- University management should allocate extra funds for makerspace deployment, while the libraries seek for external grants and donations to initiate and sustain the makerspace project.
- University libraries in its deployment of makerspace should source alternative power supply to make up for the incessant power failure in Nigeria.
- When planning for new library buildings or restructuring existing ones, university library management should make provision for makerspace.

Certain limitations are noted with regards to this present study, for which further investigations on makerspace are required. First, the approach adopted by the researcher to measure makerspace familiarity gives room for social desirability bias as respondents could conveniently give favorable answers which might not reflect their true level of makerspace familiarity. Thus, further study can adopt an assessment scale to ascertain familiarity with makerspace. Also, been a case study research, the research lacks an active power of generalization. As such, the results of the study cannot be accurately generalized to the entire university library system in Nigeria. Further research on this area can do a comparative study or investigate a wider population.

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