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Awareness of the Concept of Makerspace: The Scenario of University Libraries in Nigeria

By

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ABSTRACT

The study assessed the awareness of the concept of makerspace by librarians in university libraries in South-South, Nigeria. This study adopted the descriptive survey research design. The population of this study is 237 (Two hundred and thirty-Seven) librarians working in State, Federal, and Private university libraries in South-South, Nigeria. A total of 237 copies of the questionnaire were distributed to the respondents and 218(92%) copies were returned and found usable for the study. The data obtained from the questionnaire were analysed using descriptive statistics (frequency count and percentage). The findings revealed that the librarians in university libraries in South-South, Nigeria are aware of the concept of Makerspace to a Very High Extent. This finding also revealed that the librarians in university libraries from the South-South, Region of Nigeria are aware of the benefits of Makerspace deployment in university libraries. It is clear from the finding that no university library in South-South, Nigeria had adopted Makerspace, the finding also shows that no university library is in the process of establishing a Makerspace (Initiation Stage). The findings indicated that the challenges affecting the deployment of Makerspace in the university libraries in South-South, Nigeria are unavailability of space for Makerspace, inadequate library funding, high Cost of Makerspace facilities, inadequate qualified staff to operate the makerspace, among others. It was recommended from the study that library management should try to initiate plans to adopt and implement Makerspace in their university libraries because of its enormous benefits to users, adequate space should be allocated to site Makerspace in university libraries due to the wide range of equipment/ facilities that will be housed on the site and sufficient funding should be allocated to university libraries to cater for the cost of equipment/ facilities as well as other training-related cost for users and librarians.

Keywords: Awareness;Makerspace;Librarians;University Libraries;Nigeria

INTRODUCTION

University libraries are established mainly to aid the teaching, learning, research and recreational needs of members of their academic community. Users visit university libraries for diverse purposes; to study, for personal self development, prepare lesson notes, gather materials for research as well as independent learning and entertainment. The library is indeed a growing organism as propagated by S.R Ranganathan in 1931, as new trends are evolving for university libraries speedily. According to AL-Mousawi (2018) new trends are evolving for libraries that are focused on promoting physical visits to the library, attracting users as well as marketing the library as an active place to study and learn. One strategy that has gained prominence in attracting users as well as fostering independent learning, research and entertainment in this 21st century is the development of makerspaces for university libraries. Makerspaces are also known as Do-it-yourself spaces, learning spaces, hackerspaces, tech shop, innovative spaces etc. is a space where individuals or groups try their hands-on stuff, share ideas and invent new things. Researchers in the literature have affirmed that while some aspects of the maker movement such as hobbyists, craft and art groups, practical education, and science existed for ages, the launch of Make: Magazine in 2005 and the Maker Faire in 2006 by Dale Dougherty and its published contents about maker related projects lead to the birth of the maker movement (Burke, 2014; Ochs, Powell & Czirr, 2019). Dougherty sees making as a form of play that performs an essential psychological role and also agitated that everyone should be involved in the making movement. Burke (2014) defined makerspaces as a section in the library where users can utilise equipment and tools to design, build and create new things. Similarly, Hussain and Nisha (2017) see Makerspace as a physical space in the library that allows information, knowledge, and experience sharing which host different people that may have different backgrounds academically, ethnically, and socially.

Currently, there is a decline in the physical visit to university libraries and this could be attributed to the increasing electronic access to library services and resources that is rampant in this 21st century. Also, the dissatisfaction of a user, proximity to university library site as well as attitude of library professional could have resulted in the declining use of university libraries. To solve the challenges of decline in the physical visit to university libraries, Alonge (2020) posited that the need to satisfy the unexpressed needs of users and to influence them to patronise and

profitably engaged in libraries lead to the emergence of the makerspaces. The need for implementing makerspaces in university libraries is born out of the need to increase patronage as well as attract new prospective users to the library. The facilities/ equipment that should be in a makerspaces may differ from one university library to another and this can be influenced by the finance available at the disposal of library management during the setup stage of the maker space though there is always room for improvement in the future. Most university libraries in some cases try to acquire 3D printing machines, 3D photocopying/ scanning machines, Laser Cutters, Sewing machines, different academic software, soldering irons, CNC machines, Workspaces or tables, cameras, Computers, Blending Machines, and other consumables.

However, studies that dwell on librarians' awareness of makerspaces concept, university libraries' level of adoption of makerspaces, and the challenges affecting the full implementation of makerspaces in university libraries are very scanty. This study is carried out to fill this great lacuna in knowledge as well as add to the view existing literature on makerspaces for university libraries.

STATEMENT OF THE PROBLEM

Makerspaces are known to be of great benefits to users in terms of learning as it provides a platform for users to try their hands on stuff independently. One great benefit of makerspaces is that users can try their hands on a particular routine so many times until they get it right and this leads to mastery and enhanced knowledge in the given routine they are executing. Despite the aforementioned benefits, from observation of the researchers the adoption of makerspaces in university libraries, is still very low. It can also be observed from the literature that only a few scholars have written on librarians' awareness of the Makerspace concept in Nigeria.

This study is set out to unravel the reasons for the low adoption of makerspaces in university libraries in South-South, Nigeria as well as fill the gap in knowledge in the area of awareness of Makerspace by librarians in university libraries.

OBJECTIVES OF THE STUDY

The main objective of the study is to ascertain the awareness of makerspaces by librarians in university libraries in South-South, Nigeria. The specific objectives of the study are to:

- ✓ Find out librarians' extent of awareness of the concept of makerspace in university libraries in South-South, Nigeria.
- ✓ Ascertain librarians' understanding of the benefits of makerspace.
- ✓ Find out the level of adoption of Makerspace in the university libraries.
- ✓ Determine the challenges affecting the full deployment of makerspace in university libraries.

RESEARCH QUESTIONS

The study will provide answers to the following research questions:

- ✓ What is the extent of librarians' awareness of the concept of makerspace in university libraries in South-South, Nigeria?
- ✓ What is librarians' understanding of the benefits of Makerspace?
- ✓ What is the level of adoption of makerspace in university libraries?
- ✓ What are the challenges affecting the full deployment of makerspace in university libraries?

LITERATURE REVIEW

The literature review were done in line with the objectives of the study; literature will be reviewed on librarians' extent of awareness of the concept of makerspace by librarians in university libraries, librarians understanding of the benefits of makerspaces, the level of adoption of makerspace, and the challenges affecting the full deployment of makerspace in university libraries.

Librarians' extent of awareness of the concept of makerspace in University Libraries

There are only a handful of studies on librarians' awareness of the concept of makerspace in university libraries in Nigeria. The makerspace innovation is growing exponentially as more library managers are becoming increasingly aware of the prospects of providing communities with innovative workspaces. Kalu and Chinyere (2019) advocated for the adoption and domestication of makerspaces as an emerging trend in academic libraries. The researchers collected data from the respondents via interview through email, telephone, and face to face conversations. Results from findings revealed that university librarians were aware of the makerspace concept as an emerging learning space in academic libraries. Hussain and Nisha (2017) studied the awareness and use of library makerspaces among library professionals in India. The result of the findings revealed that all the respondents were fully aware of the concept of makerspace. Also, Okuonghae (2019) studied the issues and challenges of creating makerspaces in Nigerian libraries. The researched mention lack of skilled manpower to handle makerspaces as well as a poor level of awareness of the concept of makerspaces among librarians has lead to the decline in the deployment of makerspaces in Nigerian university libraries. However, Colegrove (2013), observed that several libraries are aware of the benefits of makerspaces to librarians and library users hence they are slowly but steadily introducing it across the globe.

Librarians understanding of the benefits of Makerspace in University Libraries

A lot of researchers have written on the benefits of makerspaces to users of university libraries, with only a few empirical studies in the area. Institute of Museum and Library Services (2014) outlined some benefits of the makerspace to include: provide organized activities and a safe environment for users to explore, allowing users to develop skills relevant in this 21st century, provide community service outlets for users to engage and develop themselves, enable users to explore and pursue their educational goals as well as access online applications useful to users. However, participants in the Mt. Elliot makerspace stated that learners' self-identity can be positively enhanced through active participation in the makerspace, with a degree of increased self-efficacy being demonstrated (Sheridan, Halverson, Litts, Brahms, Jacobs-Priebe, & Owens, 2014). Fisher (2012) outline some of the benefits of makerspace to include; makerspaces in libraries can provide an opportunity for new types of rich cross-disciplinary interaction to occur

since students from all areas and discipline can work together and share expertise, learn new skills and expand their thinking and discover new possibilities. According to Abram (2013), libraries (with Makerspaces) can: provide access to a wide variety of tools and technology; facilitate group interaction, knowledge, and resource sharing; supply access to physical space for individual project development; provide an open environment for expression of creativity and innovation; access to equipment for prototyping project ideas for users.

Adoption of Makerspace in the university libraries

Some institutions in the developed world had already embraced makerspace as a forum for providing experimental hands-on learner experiences and also as a tool to increase creativity and encourage self-development. Some notable examples of these institutions include the University of Ottawa's Richard L'Abbe Makerspace, which was established in 2014; the Invention Studio at Georgia Tech, Taubman School of Architecture's FabLab, University of Victoria MakeLab (Yusuf, Segun-Adeniran, Esse, Izuagbe, Iwu-James, Adebayo, Fagbohun, Olawoyin & Owolabi, 2019). Wong and Partridge (2016) studied thirty-one (31) of forty-three (43) Australian universities and the findings revealed that twelve (12) have makerspaces and three out of these few have two makerspaces dedicated for this purpose, these are the University of South Wales, University of Sydney and Manash University. Michalak and Rysavy (2019) did a comparison of makerspaces with academic research libraries and the findings revealed that nearly one-quarter of ARL institutions (n=26; 23%) indicated they have a makerspace. In Nigeria, the level of adoption of makerspaces is still at the early stage (Yusuf, Segun-Adeniran, Esse, Izuagbe, Iwu-James, Adebayo, Fagbohun, Olawoyin & Owolabi, 2019). Okpala (2016) made a case for makerspace for academic libraries, the researcher highlighted that the Centre for Technical Vocation Education Training and Research Mobile College established in 2015 serves as a mobile makerspace established by the University of Nigeria, Nsukka.

Challenges affecting the full deployment of makerspace in university libraries

A lot of challenges exist that affect the full deployment of makerspace in university libraries. Bell (2010) affirmed that makerspace gadgets like 3D printers, laptops, computers, laser cutters, soldering irons, propellers, sewing machines, etc. costs a lot and may be difficult to acquire with the limited fund made available hence it could pose as a major challenge to the

establishment of makerspaces. According to Aiyebilehin, Onyam, and Akpom (2018), some of the problems facing maker spaces in Nigerian libraries have been explained as persistent issues affecting all ICT-related initiatives in Nigerian libraries. These problems vary from the negative view of traditional librarians, inadequate library funding, the absence of librarians' ability to implement creative library techniques, to the absence of qualified staff to operate the makerspace. In addition, is a low level of understanding among librarians of the idea of Maker Spaces, there is the issue of poor storage facilities and poor library infrastructure maintenance culture. In addition to cost facilities and funding issues, Okuonghae (2019) in a study of the issues and challenges of creating makerspace in Nigeria libraries identified a Lack of Adequate Skilled Staff to manage makerspaces, space issues, Lack of Interest by Library Staff / Staff Resistance to Change, Incessant Power Outages, Mentorship Issues, Low User Patronage of Library, and Technophobia as the challenges affecting the adoption of makerspaces in Nigerian Libraries. Yusuf, Segun-Adeniran, Esse, Izuagbe, Iwu-James, Adebayo, Fagbohun, Olawoyin and Owolabi (2019) identified the issue of personnel training as this will incur more cost for library management as well as increase the job schedule of librarians in university libraries.

RESEARCH METHODOLOGY

This study adopted the descriptive survey research design. The population of this study is 237 (Two hundred and thirty-Seven) librarians working in State, Federal, and Private university libraries in South-South, Nigeria. The total enumeration sampling technique was used for the study because of the manageable size of the population. The instrument used for data collection was a structured questionnaire. Copies of the questionnaire were distributed to the respondents by the researchers through the aid of two (2) research assistants who were duly trained by the researchers. The data collection period will last for a period of two months. The data obtained from the questionnaire were analysed using descriptive statistics (frequency count and percentage).

RESEARCH FINDINGS

This section presents the findings of the study based on the study objectives. The data were analysed using descriptive statistics i.e. tables, frequencies, and percentages.

Questionnaire Response Rate

Table 1 revealed the response rate of the questionnaire distributed for the study.

No of Questionnaire Distributed	No of Questionnaire Retrieved	Percentage
237	218	92%

From **Table 1**, it was revealed that a total of 237 copies of the questionnaire were distributed to the respondents and 218(92%) copies were returned and found usable for the study. The response rate of 92% is considered appropriate for the study because the standard response rate for most studies is 60% (Dulle, Minish-Majanja & Cloete, 2010).

Section A: Demographic Characteristics of the Respondents

Gender Distribution of the Respondents

Table 2: Gender of the Respondents

Gender	Frequency	Percentage
Male	124	57%
Female	94	43%
Total	218	100

Table 2 shows clearly that 124 (57%) of the respondents were male, while 94 (43%) of the respondents were female.

Section B: Analysis of the key findings of the study

Find out librarians' awareness of the concept of makerspace in university libraries in South-South, Nigeria.

Table 3: Librarians awareness of the concept of Makerspace in university libraries

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

Librarians awareness of Makerspace Concept	VHE	HE	LE	VLE	Total (%)
I am aware that makerspace is a collaborative workspace	178 (82%)	18 (8%)	8 (4%)	14 (6%)	218 (100%)
I am aware that makerspace is composed of facilities such as 3D printers, laser cutters, CNC machines, soldering irons, sewing machines, etc.	164 (75%)	40 (18%)	6 (3%)	8 (4%)	218 (100%)
I am aware that makerspace enhances the independent learning experience of Users	162 (74%)	38 (17%)	12 (6%)	6 (3%)	218 (100%)
I am aware that makerspace enhances mastery of skills which results in self-development	174 (80%)	24 (11%)	14 (6%)	6 (3%)	218 (100%)
I am aware that makerspaces are informal sites for creative production in art, science, and engineering	138 (63%)	62 (29%)	14 (6%)	4 (2%)	218 (100%)
I am aware that makerspace build the creativity and innovativeness of users.	144 (66%)	42 (19%)	24 (11%)	8 (4%)	218 (100%)
I am aware that makerspace can be used for illustrative practical sessions to build users' skills.	156 (72%)	37 (17%)	12 (6%)	13 (5%)	218 (100%)
I am aware that users can utilise the facilities in the makerspace to design, build and create new things.	140 (64%)	56 (26%)	14 (6%)	8 (4%)	218 (100%)
I am aware that the output of Makerspace usage can be physical designs or designs in digital forms.	122 (56%)	58 (27%)	24 (11%)	14 (6%)	218 (100%)
I am aware that makerspace boost the interpersonal relationship between students of separate field and backgrounds.	176 (81%)	28 (13%)	10 (6%)	4 (2%)	218 (100%)

From Table 3, it was revealed from the findings that the respondents were aware of the concept of Makerspace to a Very High Extent.

Ascertain librarians’ understanding of the benefits of makerspace in university libraries

Table 4: Librarians’ understanding of the benefits of makerspace in university libraries

Understanding of the benefits of Makerspace	True	False	Total (%)
Makerspace provides an organized and safe environment for users to explore.	204 (94%)	14 (6%)	218 (100%)
Makerspace enhances the independent learning experience of users	208 (95%)	10 (5%)	218 (100%)
Makerspace allows users to develop skills relevant in this 21st century.	212 (97%)	6 (3%)	218 (100%)
Makerspace provides community service outlets for users to engage and develop themselves.	196 (90%)	22 (100%)	218 (100%)
Learners’ self-identity can be positively enhanced through active participation in the makerspace.	145 (67%)	73 (33%)	218 (100%)
Makerspace provides the opportunity for new types of rich cross-disciplinary interaction	202 (93%)	16 (7%)	218 (100%)
Makerspace enable learners to share expertise, learn new skills, and expand their thinking	186 (85%)	32 (15%)	218 (100%)
Makerspace provides an open environment for the expression of creativity and innovation	168 (77%)	50 (23%)	218 (100%)
Makerspace can be used for practical sessions for learners	180 (83%)	38 (17%)	218 (100%)
Makerspace boost problem-solving and critical-thinking skills	192 (88%)	26 (12%)	218 (100%)
Makerspace can also be used to meet the recreational needs of users	174 (80%)	44 (20%)	218 (100%)

Table 4 showed the respondents' understanding of the benefits of Makerspace. The respondents indicated that it is true Makerspace allows users to develop skills relevant in this 21st century, Makerspace enhances the independent learning experience of users, Makerspace provide an organized and safe environment for users to explore, Makerspace provides the opportunity for new types of rich cross-disciplinary interaction, Makerspace boost problem-solving and critical-

thinking skills, Makerspace provides community service outlets for users to engage and develop themselves, Makerspace enable learners to share expertise, learn new skills and expand their thinking, Makerspace can be used for practical sessions for learners, Makerspace can also be used to meet the recreational needs of users, Makerspace provides an open environment for expression of creativity and innovation and Learners' self-identity can be positively enhanced through active participation in the Makerspace. This finding implies that the librarians from the South-South, Region of Nigeria are aware of the benefits of Makerspace deployment in university libraries.

Find out the level of adoption of Makerspace in the university libraries

Table 5: Level of adoption of Makerspace in the university libraries

Adoption of Makerspace in university libraries	Frequency	Percentage
Makerspace is adopted fully in my university library	-	-
Makerspace is in its initiation stage in my university library	-	-
Makerspace is not adopted in my university library	218	100%

From the findings in **Table 5**, it is glaring that no university library in South-South, Nigeria had adopted Makerspace, the finding also shows that no university library is in the process of establishing a Makerspace (Initiation Stage). This implies that much more work still needs to be done in the area of marketing the prospect of makerspace to library and university management. Much emphasis is laid on the electronic library section of the library which is totally different from the Makerspace Concept.

Determine the challenges affecting the full deployment of Makerspace in university libraries

Table 6: Challenges affecting the full deployment of Makerspace in university libraries

Challenges Affecting the Deployment of Makerspace in university libraries	SA	A	D	SD	Total (%)
High Cost of Makerspace Facilities	204 (94%)	8 (4%)	3 (1%)	3 (1%)	218 (100%)
The negative view of traditional librarians to Makerspace	174 (80%)	28 (13%)	10 (4%)	6 (3%)	218 (100%)
Inadequate library funding	206 (94%)	5 (3%)	7 (3%)	-	218 (100%)
Inadequate qualified staff to operate the makerspace	202 (92%)	8 (4%)	4 (2%)	4 (2%)	218 (100%)
Unavailability of space for Makerspace	210 (96%)	6 (3%)	2 (1%)	-	218 (100%)
Poor library infrastructure maintenance culture	168 (77%)	28 (13%)	10 (5%)	12 (5%)	218 (100%)
Incessant Power Outages	144 (66%)	46 (21%)	12 (6%)	16 (7%)	218 (100%)
Cost of personnel/ patrons training	138 (63%)	66 (30%)	8 (4%)	6 (3%)	218 (100%)
Copyright and Intellectual Property infringement	124 (57%)	82 (38%)	6 (3%)	6 (3%)	218 (100%)
Distraction to users as much time can be spent in Makerspace	148 (68%)	38 (17%)	24 (11%)	8 (4%)	218 (100%)
Users safety Issues	178 (81%)	22 (10%)	12 (6%)	6 (3%)	218 (100%)
Neatness, Noise and Maintenance issues	122 (56%)	64 (29%)	22 (10%)	10 (5%)	218 (100%)
Security of the Makerspace Facilities	132 (61%)	58 (27%)	12 (5%)	16 (7%)	218 (100%)

From **Table 6**, the respondents indicated that the challenges affecting the deployment of Makerspace in their university libraries are unavailability of space for Makerspace, inadequate library funding, high Cost of Makerspace facilities, inadequate qualified staff to operate the makerspace, users safety issues, negative view of traditional librarians to Makerspace, poor library infrastructure maintenance culture, a distraction to users as much time can be spent in

Makerspace, incessant power outages, cost of personnel/ patrons training, the security of the Makerspace facilities, copyright and intellectual property infringement, and neatness, noise and maintenance issues.

DISCUSSION OF THE FINDINGS

The study was carried out to assess the awareness of the concept of makerspace by librarians in university libraries in South-South, Nigeria. The study recorded a response rate of 92% which was considered adequate for the study. The data from the study shows that there were more male respondents than females in the study.

Librarians' awareness of the concept of Makerspace in university libraries

It was revealed from the findings that the respondents were aware of the concept of Makerspace to a Very High Extent. This finding aligns with the study of Hussain and Nisha (2017) which revealed that library professionals in India were fully aware of the concept of makerspace. This finding is in total disagreement with the study of Okuonghae (2019) which revealed that a poor level of awareness of the concept of makerspaces among librarians has hampered its deployment in Nigerian libraries. This implies that awareness of the concept of Makerspace is not the issue facing the adoption of it in university libraries as a majority of the librarians in South-South, Nigeria are fully aware of the concept.

Librarians understanding of the benefits of Makerspace in University Libraries

This finding revealed that the librarians from the South-South, Region of Nigeria are aware of the benefits of Makerspace deployment in university libraries. This finding aligns with the affirmation of Abram (2013) that Makerspace is highly beneficial to university library users in different capacities.

Level of adoption of Makerspace in the university libraries

It is glaring that no university library in South-South, Nigeria had adopted Makerspace, the finding also shows that no university library is in the process of establishing a Makerspace (Initiation Stage). This finding does not align with the study of Yusuf, Segun-Adeniran, Esse, Izuagbe, Iwu-James, Adebayo, Fagbohun, Olawoyin & Owolabi, 2019 which revealed that some

institutions in the United States are already deploying Makerspaces for the interactive learning experience of their users. The finding also is in variance with the study of Wong and Partridge (2016) which revealed that some Australian universities are already deploying Makerspace to build the skills of their users. The scenario is different in the South-South region of Nigeria where all the university libraries are yet to deployed Makerspace despite the increased awareness of the concept and its benefit.

Challenges affecting the full deployment of Makerspace in university libraries

The findings revealed that the challenges affecting the deployment of Makerspace in the university libraries in South-South, Nigeria are unavailability of space for Makerspace, inadequate library funding, high Cost of Makerspace facilities, inadequate qualified staff to operate the makerspace, users safety issues, negative view of traditional librarians to Makerspace, poor library infrastructure maintenance culture, among others. In the study of Aiyebilehin, Onyam, and Akpom (2018) the issue of funding was raised as one of the major challenges affecting the deployment of Makerspace in Nigerian libraries. The issue of space for Makerspace in university libraries came out prominent in this study as most university libraries in South-South, Nigeria do not have space for the purpose of Makerspace.

CONCLUSION

Makerspace is an innovative space where individuals or groups can try their hands on stuff, build interpersonal skills, and master particular skills leading to self-development. The Do-it-yourself concept of makerspaces has helped to build the confidence of library users as they attempt stuff independently which in turn makes them creative and self-reliant. The Makerspace innovation is gaining great momentum as librarians in university libraries are increasingly aware of the concept of Makerspace as well as the benefits of it. Despite the increasing awareness of the concept and benefits of Makerspace, all the university libraries from South-South, Nigeria are yet to deploy Makerspace. For university libraries to successfully initiative Makerspace, there ought to analyze the challenges that could hamper the successful implementation of the innovation.

However, from the study, some notable challenges that ought to be addressed are space-related issue to site the makerspace, inadequate library funding, high Cost of Makerspace

facilities, inadequate qualified staff to operate the makerspace, users safety issues, negative view of traditional librarians to Makerspace, poor library infrastructure maintenance culture, a distraction to users as much time can be spent in Makerspace, incessant power outages, cost of personnel/ patrons training, among others. It is high time, university libraries in Nigeria live up to their responsibility as the hub of creative learning space, knowledge creation, and dissemination. Makerspace can help solve the issue of declining use of university libraries in Nigeria, as users would be attracted to use the facilities and explore, building their skills while they interact with their colleagues. It is, therefore, necessary for library managers and university management to support the deployment of Makerspace innovation in their university libraries.

RECOMMENDATIONS

The following recommendations were made in line with the findings of the study:

1. Library management should try to initiate plans to adopt and implement Makerspace in their university libraries because of its enormous benefits to users.
2. Adequate space should be allocated to site Makerspace in university libraries due to the wide range of equipment/ facilities that will be housed on the site.
3. Sufficient funding should be allocated to university libraries to cater for the cost of equipment/ facilities as well as other training-related cost for users and librarians.
4. Safety protocols for both users and equipment in Makerspaces should be in place in university libraries to guide against fatalities.
5. Users of makerspaces should adequately be guided on the ethical issues involved in the use of makerspaces especially the issue of prototyping and other copyright infringements that might occur.

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