Makerspace in the Academic Libraries in Nigeria: Issues and Benefits

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Abstract
The purpose of makerspace is to allow patrons to learn through direct experimentation and from each other. It is more about the intentions of the makers than about the qualities of the space itself. This paper seeks to contribute to makerspace literature in the academic libraries in Nigeria. They authours examined this through understanding the purpose and history of makerspace, what is done in makerspace, value of makerspace in the academic library, procedures for establishing makerspace, challenges and way forward. conclusively, makerspaces can be seen as an emerging phenomenon that could help form positive directions for academic librarianship and learning technologists, an opportunity to be involved in supporting a less distant, more embodied and human relationship with technology and of teaching information, digital and critical literacy in a new context.

Keywords: Makerspace, Technology Devices, Digital literacy, Academic libraries, Learning technology.

Introduction

The MakerSpace is a place to safely use tools and equipment to explore creativity and test technical skills. It's open to all students and staff to walk through and engage with new technologies and tools. A makerspace is a place where students can gather to create, invent, tinker, explore and discover using a variety of tools and materials. A library makerspace may be an area and/or service that offers library patrons an opportunity to create intellectual and physical materials using resources such as computers, 3-D printers, audio and video capture and editing tools, and traditional arts and crafts supplies.

Makerspaces are classified as a type of library service offered by librarians to patrons. Patrons of varying ages can work together, alone, or with library staff on creative projects. These spaces often give community members access to tools, technology, and social connections that may not be easily accessible otherwise. Library makerspaces do not require specified areas; a pre-existing space can be temporarily

modified (or "made") to better suit the needs of participants. A place where some tools, materials, and enough expertise can get them started. These places, called makerspaces, share some aspects of the shop class, home economics class, and the art studio and science labs. In effect, a makerspace is a physical mash-up of different places that allows makers and projects to integrate these different kinds of skills stated by Dale (2016), A Makerspace is a metaphor for a unique learning environment that encourages tinkering, play and open-ended exploration for all as agreed by Laura (2017); she also adduced that academic library maker space assessment literature is still in its infancy.

An academic library is a library attached to a higher education institution which serves two complementary purposes to support the school's curriculum, and to support the research of the university faculty and students. The support of teaching and learning requires material for class readings and for student papers. In the past, the material for class readings, intended to supplement lectures as prescribed by the instructor, has been called reserves. In the period before electronic resources became available, the reserves were supplied as actual books or as photocopies of appropriate journal articles. Academic libraries must determine a focus for collection development since comprehensive collections are not feasible. It is in view of this that the focus of this paper is to examine issues and benefits makerspace in the academic libraries in Nigeria.

History of Makerspace

Over 20 years ago in Germany, the concept called a hackerspace began. The first independent one (called C-Base) was a place where programmers could meet, work and share ideas. While these types of spaces had existed in u[illegible] and corporations, this was the first independent space where any programmer, no matter his or her affiliation, could go to collaborate with other likeminded programmers. Other hackerspaces soon followed both in Germany and around the world. The goal of these spaces was to "hack" technology to make it do things it wasn't meant to do.

Over time, the hackerspace evolved. As cutting-edge technology such as 3d printers and CNC machines became less expensive, hackerspaces branched out and makerspaces were born. At this point in time, there is little difference between the terms hackerspace and makerspace. Hackerspace is a community-operated workspace where people with common interests, often in computers, technology, science and digital art can meet, socialize and collaborate. This definition also can apply to a makerspace. In fact, there are a variety of terms used interchangeably at this point. Hackerspace, Makerspace, TechShops, FabLabs and Innovation Spaces have all been used to describe similar concept. Makezine.com has a very good article describing the nuances of these spaces. Whatever they are called, however, the idea

of a large collaborative space focused on innovation in science, technology, engineering, art and math grew. Corporations, commercial spaces, k-12 schools and universities began to see the value that this type of thinking could offer to employees, communities, teachers and students.

The force behind the initial "maker movement" is believed to be the creation of Make: magazine in 2005, which published information about maker-related projects. The momentum grew when the magazine devised a series of venues for makers to express themselves and share their creations deemed "maker fairs" Libraries took notice and began offering programs and redesigning spaces to address related interests within their communities. The first public library with a maker space was the Fayetteville Free Library (2015). The Library created spaces where students, adults, and other "makers" can do hands-on projects as part of a learning process or the development of an idea or product is a movement that is gathering steam around the country and the world. The new value placed on labs that are places for developing skills for innovation and invention harkens back to the age of Thomas Edison and Alexander Graham Bell and breakthroughs such as the electric light bulb and the telephone. There is a new understanding that evolving technologies can empower people and especially students to create solutions to problems and challenges in our world. In fact, the ability of America to compete on the world stage may depend on the ingenuity of their youth and their ability to create solutions to the problems that face humanity.

The Value Of Makerspaces In The Academic Library

A makerspace is an ideal place to incorporate more STEAM (science, technology, engineering, art and mathematics) activities into a fun and inspiring environment beyond the constraints of a traditional classroom setting. Because academic libraries already nurture critical thinking and learning, they are a perfect environment for makerspaces: Librarians can help faculty develop new assignment types that both connect to the disciplinary content and encourage students to experiment with new media. According to the NMC(2015), makerspaces have the potential to effectively address the necessary skill sets for students in the 21st Century. In many cases, faculty is open to thinking about such assignments if they are not solely responsible for the technical aspects of its implementation and the associated risks (Lippincott, Vedantham, & Duckett, 2014). For example, the librarian, as an information specialist, possesses the knowledge and expertise to guide budding scientists to the right instructions and information through library sources such as virtual databases, informative websites and credible journals. However, according to Augustine, (2014), collaborating with trained STEM/STEAM educators, technology faculty and library staff may provide new opportunities by combining their shared skill set and expertise. Science educators and librarians can create a partnership to develop

spaces for probable heightened collaboration, enhanced mutual respect and the achievement of common professional goals.

Issues and Enhancement Strategies on Makerspace In Nigeria Academic Libraries

It is important to consider the following potential makerspace challenges as a "look before you leap" strategy.

(a) Cost of Implementation: While it is certainly possible to establish an academic library makerspace without any significant costs in terms of supplies and space requirements, a developing makerspace will most likely involve extra expenditures over time.

(b) Staffing and Scheduling: Sufficiently staffing a library makerspace and providing programming can be challenging. As Moorefield-Lang (2015) reports, librarians need to get creative with their staffing models when balancing the task of managing both a library and a makerspace. In many libraries outside the country there is only one person available to balance both responsibilities.

(c) Staff and Patron Training: Both librarian and patron training are necessary aspects of library makerspaces, yet these training opportunities are not always readily accessible. As Moorefield-Lang (2015) describes, "Training for maker learning locations continues to be difficult to obtain" and "most preservice librarians are graduating each semester not knowing the skills needed to maintain and serve in makerspaces". Therefore, the impetus to obtain training, keep abreast of new technologies and trends and develop a professional learning network often lies with the librarian or library staff.

(d) Neatness, Noise and Maintenance: Makerspaces, by their very nature, make environment very deity and in some cases, maker activities have the potential to damage existing furnishings. For example, carpets, tables and other surfaces can be damaged with the use (or abuse) of maker tools on their surfaces.

(e) Safety and Liability: Patron safety becomes a primary consideration when makerspaces provide potentially hazardous equipment that could cause harm when used incorrectly or without proper supervision. For example, many makerspaces provide tools like soldering irons, laser cutting equipment and sharp implements such as woodworking tools or saws. As Burke (2014) suggested, for some of the more complicated makerspace equipment there should be a certification process in place for users who wish to use such items.

(f) Copyright and Intellectual Property: A "grey area" surfaces with the newness of rapid prototyping such as 3-D printing in library makerspaces: there are concerns over issues such as copyright infringement, liability and intellectual property. Slatter and Howard (2013) report on the "unique challenges brought to the forefront by content-creation spaces regarding ownership of materials created at the library and legal implications". Furthermore, Moorefield-Lang (2015) reports that a number of

libraries have addressed copyright and intellectual property rights within their user-agreements, placing the onus on the patron to ensure that he/she is respecting copyright law when creating products in the makerspace.

(g) Resistance to Change: Finally, resistance to change can be a library makerspace challenge. As Slatter and Howard (2013) report, library staff can be reluctant to embrace change in their libraries while patrons can be hesitant to accept new directions in library programming. Furthermore, Burke (2014) advises librarians to be prepared with strong rationale for library makerspaces adding the following caution:"Library makers must expect that makerspaces will be questioned in their communities and will not have an easy road to universal acceptance"

Conclusion

Makerspaces represent a desire for radical reform of the education system. An innovation-led economy requires more creativity and problem-solving skills. For schools and universities, makerspaces represent a way to bring creativity and hands-on, project-based learning into Nigeria's education system. It is hoped that makerspaces can help foster grassroots innovation and entrepreneurship. Although maker culture is inevitably open to criticism on the grounds of being an unrealistic ideological movement, it is perhaps impossible to achieve any kind of socially and culturally transformative change without an element of "hope" of positive outcomes:

Within universities, this study has begun to explore how learning can be achieved in makerspaces. Through participation in open access learning environments outside of restrictive normative curriculum structures, each makerspace potentially provides a cross disciplinary experiential learning space that fosters innovation and creativity and allows for self-efficacy to be developed through self-directed learning opportunities in a productive, mutually supportive community environment. Because the academic library is a venue where students assemble to collaborate and learn, it is an ideal area for a makerspace to thrive.

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