

# The Creation and Adoption of Technology-Centred Makerspaces in South African Academic Libraries

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## ABSTRACT

Libraries of today are not just a place to consult books and other pedagogical materials but have completely transformed into a space where users can interact, create, and collaborate. Library and information centres are creating spaces called makerspaces in this digital transformation era, whereby researchers work together and share ideas in their various areas of specialisation. Makerspace are relatively new phenomena that create a collaborative and innovative environment for individuals to work on projects and learn about emerging technologies. Technology-centred makerspaces are increasingly being built in academic libraries, typically featuring high-tech machines and software that facilitate creation and design. This study investigated the creation and adoption of technology-centred makerspaces in academic libraries and the impact that makerspaces have on academic innovation. The study utilized literature review analyzed secondary data from articles, journals, periodicals, and publications to identify the need to design makerspaces, what is required in setting up a makerspace, and how academic libraries utilize makerspaces. The benefits accrued from makerspaces, barriers to effective adoption of these spaces, factors enabling adoption of makerspaces, and the state-of-the-art facilities offered by the library were also explored in this study. It is recommended that library management should not hesitate to establish makerspaces in their respective academic libraries, as this will aid in promoting knowledge-sharing, collaboration, creativity, and innovation.

## KEYWORDS

Academic Innovation, Academic Library, Collaborative Learning, Digital Innovation, Digital Library, Hackerspace, Knowledge-Sharing, Makerspace

## INTRODUCTION

Academic libraries are ever-changing hubs, resolutely benefitting the students, faculties and communities that support them. However, with the advent of digital technologies, academic libraries have lost their monopoly as the primary information providers. As noted by Filar-Williams and Folkman (2017), the future of libraries is to be user communities engaging in creating content and using it for community-building, connecting people, engaging students, assisting researchers, advancing knowledge production and promoting knowledge-sharing. Makerspaces, also called hackerspaces or fablabs, make a unique contribution to the partnership between academic libraries

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and digital humanities by providing a creative space for learning new skills and knowledge, experimenting, and sharing materials and equipment. The American Library Association (ALA) pointed out that library makerspaces cultivate community around learning and that they reinforce learning, spark innovation and build problem-solving skills. De Beer et al. (2017) describe ‘making’ as applying creative skills using technologies and tools both digital and analogue, and maker-community activities as driven by values of collaboration, experimentation and problem-solving. The term ‘makerspace’ has been in use since the publication of *Make* magazine in 2005, and the subsequent launch of Maker Faire, an event that demonstrated the popularity of making and showcasing new technologies (Wong & Partridge, 2016).

Makerspace is a collaborative space where people with ideas and interest in technology come together to learn new things, work with their peers on projects, invent new projects, share ideas and consider new ideas. It thus provides the physical space that promotes collaboration between individuals with various and distinct areas of knowledge, which is fundamental to fostering a creative environment. As noted by Konopasky and Sheridan (2020), the making happens across a variety of spaces where there is an educational focus, both informal (i.e. museums, community centers and libraries) and formal (from K–12 to higher education). Makerspace movement thus aimed at supporting a range of learner activities and outcomes including equity, access to technology, virtual community and support, social interaction and creativity (Konopasky & Sheridan, 2020). This expansion of academic library space and function is broadly meant to allow the library to more aptly house functions that support academic success and provide opportunities for faculty and students from different disciplines to mingle (Lewis, 2017).

The establishment of makerspaces encompasses a variety of spaces that match the variety of ways whereby students and faculty do their work quietly and privately in groups with their own technology and with technology supplied by the library (Lewis, 2017). Libraries have remained an ideal setting for makerspace events, and many makerspaces offer community resources like software, hardware, electronics and more. Makerspaces vary depending on the library, but involve providing access to a litany of creative tools like laser cutters, 3D printers, sewing machines, bike repair facilities, microcontrollers, circuits, clay and porcelain (Mestre, 2020). Makerspaces are also associated with creating, building and crafting, and getting hands-on experience in activities ranging from woodworking, sewing and building computers to audio-recording and video editing (Fourie & Meyer, 2015). The success of makerspaces at drawing students to the library is gaining global attention, and universities worldwide are turning to academic libraries as a model on which to base their own makerspaces (Curry, 2017).

While many makerspaces in public libraries are not necessarily high-tech, the ones in academic libraries are almost always centred on technology (Curry, 2017). Makerspaces are also an emerging phenomenon in the United Kingdom, with some universities such as Cardiff, Falmouth, Strathclyde, Kent and University College London (UCL) having developed these technology-based community workspaces (Curry, 2017). The Department of Library Services at the University of Pretoria (UP) is also a home to the first library makerspace in South Africa, and it is open to all students and staff, whether for assignments or personal interest. The UP makerspace gives students access to some of the latest technology trends such as 3D printing, 3D scanning, electronics and 3D design software. Access to the UP makerspace is free, and there are a handful of library assistants waiting to help users. UP or academics are also welcome to contact the makerspace for assistance and guidance for enhanced teaching and learning.

## **RATIONALE FOR THE STUDY**

Traditionally, academic institutions have not promoted environments in which individuals and students play an active role in their own education as well as that of their peers. A makerspace is a technology-enabled space for making things, or an environment where individuals come together to

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