More than Shiny New Spaces for Tinkering: Fostering Design Practices and Thinking in University Makerspaces

Carol B. Brandt, Temple University, USA
Rikke Toft Nørgård, Aarhus University, Denmark

Recently Makerspaces have made a bold appearance in universities as an effort to cultivate skills in innovation and creativity among tertiary students (Barrett et al., 2015). Makerspaces are open learning environments where Science, Technology, Education, and Math (STEM) educational tools and materials are used. Such design studios, also known under names such as makerspaces, hackerspaces, and fablabs, are creative, do-it-yourself (DIY) spaces where people can gather to ideate, create, invent, and learn with new technologies. Celebrated as being on the cutting edge of innovation, makerspaces are touted as providing students with creative opportunities. Yet, we contend that exposure to this learning environment with its technology is not sufficient to propel students into a creative mindset or a maker identity (Anderson, 2012).

The purpose of this paper is to provide a framework for pedagogy in university makerspaces. We argue that becoming proficient in design practice and design thinking is vital for makerspaces to realize their potential. Design practices and design thinking are central to these learning environments even though the tools, the characteristics of the spaces, and the technologies vary widely. Ames et al. (2014) argues that a common goal of makerspaces is the development of a making culture, founded on democratic notions whereby participants have equal access to building, sharing knowledge, and leading discovery. Toward this goal, makerspaces require staff and instructors to facilitate learning that contrast fundamentally from the didactic instruction of a lecture, or even laboratory-based instruction (Brandt et al., 2013). Using a theoretical framework based on learning communities (Lave & Wenger, 1991), we define design thinking as related to a set of practices: how to approach a problem, iterate ideas, prototype, and critique solutions (Schön, 1987). Design thinking is not always an intuitive process; it requires practice, training, reflection, and flexibility (Nørgård, 2015; Sheridan et al., 2014).

Yet, few STEM instructors or staff have experience in a design studio or understand what it means to facilitate students’ learning and design thinking. Being technological literate and skilled in coding doesn’t necessarily qualify a person to teach in a makerspace. This paper outlines practices that introduce students to the norms of particular design communities (Human Computer Interaction, Engineering, or Industrial Design, for example). To understand the cultural practices and construction of knowledge in the makerspaces, we use data from a two-year qualitative study of design studios at three US universities. Through the analysis of video data, design artifacts, and tools for tracking meaning making as it occurred in the studio between students and their instructors, we offer a framework for training instructors and support staff in ways to facilitate students’ design work and building in university makerspaces. In this way, makerspaces can be a model for a different kind of learning in the university, one in which staff, instructors, and students co-create and innovate to solve pressing problems in their own communities.


