

Beyond the Page: Outreach and Research in Academic Library Makerspaces

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INTRODUCTION

Libraries have long been centers of support, outreach, and research, but one normally thinks of these in terms of books and archives. The library of the twenty-first century, however, is rapidly being reimagined as a place beyond the page, fostering “creativity, innovation, and ‘making’” of knowledge in new arenas [1]. As a literal manifestation of knowledge production, ‘making’ has recently taken hold in libraries through the form of fabrication services and makerspaces. Often cited as central, academically-neutral campus spaces, libraries already embrace many facets inherent in maker culture; they provide not only a “Third Place” to support collaborative research and experimentation, [2] but also library staff members who embrace maker values of access, democracy, diversity, education, and lifelong learning as part of the American Library Association’s Core Values of Librarianship [3].

Still, the link between academic research and makerspaces is not always apparent for faculty, staff, and students of disciplines traditionally bound to the book. Active curation and outreach by experienced staff members are often necessary to prompt interest and critical engagement for those unfamiliar with making technologies. Using examples from two library makerspaces at the University of Virginia and Temple University, this paper argues that active engagement and outreach by knowledgeable and passionate makerspace staff are often critical for expanding critical making and tinkering to fields traditionally without studio, workshop, and lab experience. In particular, the staff provide access points for faculty and students through contextualization, collaboration, and publication, thereby integrating making within broader academic interests, as well as shaping its role in future educational and research trends.

BARRIERS-TO-ENTRY

When discussing makerspaces, the physical space, equipment, materials, and safety are often primary topics. This focus is perhaps unsurprising given the term ‘makerspace’--with both the agent of action and the location present in the designation itself. Yet, it is undoubtedly also due to the financial and organizational logistics required to designate or adapt a space, acquire the necessary equipment and materials, and develop safety procedures. When discussing ways to reduce barriers-to-entry, or obstacles users might encounter, it makes sense to focus on these factors. Aiming to foster critical making and engagement through iterative experimentation and tinkering, the University of Virginia’s Scholars’ Lab Makerspace and Temple University’s Digital Scholarship Center (DSC) Makerspace are situated within libraries to accommodate some of these very considerations. The Scholars’ Lab

Makerspace (located in the Alderman Library) and DSC Makerspace (located in the Paley Library) both occupy highly accessible spaces within their campus’ main library and both are attached to digital humanities and digital scholarship centers. Both provide training and hands-on access for a range of maker tools, including 3D printers, Arduino and Raspberry Pi, 3D scanners, sewing machines, and a laser cutter between the two of them. Moreover, both are funded primarily by the library, charge little or no fees for use, and provide 30-40 hours a week of open access and staff support.

Yet, “build it and they will come” does not necessarily apply to library makerspaces. While many users are familiar with making through their academic studies or personal interests, many faculty and students have never encountered these technologies or methods, let alone thought critically about the relevance of making for their own research. Even though the library is in an academically-neutral space, this unfamiliarity and even confusion about the purpose of a makerspace and how it is used might create the sense that a makerspace is not open or relevant to everyone. While themed programs or project-based workshops might expand participation, this apparent irrelevance is a major barrier-to-entry for faculty and students who might otherwise benefit academically from critical making and the resources found in a makerspace. Active support from makerspace staff and continual outreach are therefore vital to bridge this disconnect and reduce any mental barriers-to-entry.

CONTEXTUALIZATION

Makerspace staff members at both institutions are not only critical for the reception and training of users coming into the space, but also the contextualization of makerspace methods and results in a variety of different fields. The Scholars’ Lab Makerspace is staffed by five to seven paid undergraduate and graduate students and supported by full-time Scholar’s Lab staff members, while the DSC is staffed by a combination of full-time library staff members, Council on Library and Information Resources (CLIR) Postdoctoral Fellows, and graduate students. As part of their position, the staff members at both institutions are encouraged to tinker in the makerspace and develop projects related to their personal and academic interests as part of their job description. This freedom of access, time, and materials allows staff members to experiment, iterate, and even fail, all while gaining to experience and insight into makerspace technology and workflows.

Staff members at the Scholars’ Lab and DSC makerspaces all have diverse academic backgrounds; spanning science, engineering, humanities, and business fields. As they develop their own technical expertise and research interests in the

makerspace, staff members are encouraged to lead open workshops that contextualize the tools, theories, and methods. At the Scholars' Lab Makerspace, workshops include Intro to photogrammetry, wearable electronics, sewing, and 3D printing. At the DSC Makerspace, workshops include Unity 3D, 3D modeling for 3D printing, introduction to photogrammetry, and play host to a physical computing community group. Moreover, many staff members take on their own collaborative projects with faculty, students, and staff both within and outside their fields of specialty. As makers, tinkerers, and researchers themselves, they act as a bridge between these resources and the academic world they inhabit and provide a low-stakes introduction to making that might not be possible within discipline specific venues. For example, one Bio-med student at the University of Virginia expressed more comfort coming to the Scholar's Lab Makerspace over her own department fabrication space because there was less pressure and judgement as she tried and iterated upon her ideas.

COLLABORATION

In order to expand the user base and relevance in other fields, both the Scholars' Lab and DSC actively establish collaboration and innovation across departments and disciplines within the makerspace.

For example, to attract more scholars from humanities departments, the Scholars' Lab provides small grants and fellowships (funded by the Library) to graduate students who are working on digital humanities projects. This year, their Praxis Program will fund six graduate students during a year-long concentration on makerspace technologies in a collaborative research project supported by full-time staff familiar with makerspace capabilities. The Scholars' Lab also recently funded and supported a graduate student from the music department to build a physical representation of his project that looks at the audio and video lost during the MP3 and MP4 compression.

The DSC Makerspace, in turn, has forged collaborative relationships with other Temple libraries and departments to encourage creative application of this technology by both deferring and funding making activities. For instance, in collaboration with Ginsburg Library, the DSC Makerspace established a pilot program for free 3D printing for educational, research, or clinical purposes. With the conclusion of the pilot this fall, the libraries will evaluate if it is sustainable to implement permanently. Alternatively, a collaboration with the Center for the Advancement of Teaching generated a new annual Innovative Teaching with Academic Makerspace Technologies grant to cover any equipment and material expenses for makerspace assignments. While the grant encourages faculty to try new teaching methods by awarding grants ranging from \$500 to \$3,500, the grant also provides them with the opportunity to shape the makerspace by selecting the technologies and materials they need. DSC staff member outreach has been critical throughout this process as they participated in presentations on critical making, workshops on course design and objectives for different technologies, and individual project consultations leading up to the application deadline. The six faculty recipients represent architecture, radiology, surgery, sociology, and media studies and will present on their

experiences at Temple University's Teaching with Technology symposium in Spring 2018.

By providing the incentive, time, funding, and support for these projects, the UVA and Temple makerspaces expand the stakeholders, users, and audience of the makerspace beyond the immediate space to the larger academic mission of their libraries and universities.

PUBLICATION

In the work of experimentation and tinkering, both positive and negative results are important to guide academic and educational discussions. It is therefore imperative that students, scholars, and employees alike discuss their experiences. At both the Scholars' Lab and DSC Makerspaces, makerspace staff members (graduate and full-time) and users alike are encouraged to share their process and results through blog posts, conference presentations, and peer-reviewed articles.

At the Scholars' Lab Makerspace, two collaborative makerspace projects were initially shared through a Scholar's Lab staff member's blog posts. The first of these projects, 3D printed archaeological sites and artifacts, was subsequently picked up and featured in a campus publication, a local NBC affiliate, and finally CBC Radio in Canada. The second project, a 3D printing assignment for a Russian course, was later presented by the instructors at the November 2016 Association for Slavic, East European, and Eurasian Studies conference and accepted for publication in *Russian Literature*.

At Temple University, student workers are also encouraged to blog about their makerspace experiments. Faculty, however, are increasingly showing interest in publishing their makerspace experimentation and results. While these projects have not been completed or written about yet, DSC staff members are currently working with researchers in biology to accurately describe the 3D printing process they used to generate models used in their experiments. These researchers aim not to communicate their results, but rather the limitations and potentials of the process for other researchers to try. More recently, one recipient of the Innovative Teaching with Academic Makerspace grant is working with DSC staff members to devise an experiment testing the use and efficacy of using anatomical 3D models in their course.

These publications provide opportunities not only to shape public engagement in makerspace methods and results, but also academic discussions of making and pedagogy. As scholars, departments, and institutions become more familiar with the advantages of makerspace research and opportunities, it will encourage others to experiment with and build on their successes.

CONCLUSION

While the Scholars' Lab and DSC makerspace differ in some particulars, they nevertheless support non-science disciplines by breaking down barriers to entry and through contextualization (helping humanities scholars see their scholarship as making), collaboration (support for and working with students, faculty and staff on research projects), and publication (creating and supporting scholarship and outreach surrounding academic making). Both institutions are experimenting with various methods and modes of encouraging scholars to

utilize the space and resources. Recently, the UVA Library conducted a student survey to gauge interest in and understanding of makerspaces at UVA in general. The survey was conducted with the intent to guide efforts to create a new undergraduate focused, highly available makerspace in one of the libraries. The limited survey showed that most students were unfamiliar with makerspaces, but were interested in the technology offered.

While analysis of makerspaces in libraries is yet nascent, the following steps seem critical in making a library makerspace a success:

- Find someone passionate to run the makerspace. It is imperative to find at least one person who is excited about the technology and wants to share the knowledge and tools with others. Excitement begets excitement.
- Make it as easy as possible to use the space. Think about the location, the signs used to notify and direct people, and the physical barriers (doors, walls, partitions) that allow or prohibit visibility of the space. A more open floor plan provides a feeling of an open and accessible space. Mental barriers must also be addressed. Continual outreach to faculty and students through workshops, project descriptions, blog posts, and other forms provide needed prompts and encouragement for future makers.
- Give people incentives to use the technology. Secure funding from the library or collaborate with teaching and technology centers. Reach out to department chairs, deans and provosts about how to fund research.
- Network with liaisons and train library staff about what you do. They meet students all day long. One of the important purposes of a library is to match researchers with resources. If your library staff know about your space and the resources available, then they can refer the students they meet.

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[2] Usually identified as cafés, bars, coffee shops, and beauty parlors, a Third Place functions as place away from home and work (or dorm and classroom) that has no entry fee or is inexpensive. It is a welcoming place with comfortable furniture, an inclusive atmosphere, and is both intellectually and socially stimulating. Libraries already fit many of these characteristics, as do Makerspaces. As libraries adjust to changing patron needs (as they always have), it makes sense to add the ability to apply knowledge in the form of making. Theresa Willingham and Jeroen de Boer, *Makerspaces in Libraries*, Lanham, MD: Rowman & Littlefield, 2015.

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APPENDIX: ADDITIONAL READING

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