Critical Making with a Raspberry Pi - Towards a Conceptualization of Librarians as Makers

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ABSTRACT
Makerspaces, designated spaces to foster creativity and technology skills, are increasingly being incorporated into libraries. Although makerspaces in libraries are depicted positively in the literature and are praised by professional organizations, there is little exploration of the acculturation that results as libraries and makerspaces learn to coexist. In keeping with Matt Ratto’s model of “critical making,” we used the process of collaboratively building an interactive Readers’ Advisory Device (RAD) that runs on a Raspberry Pi computer to elicit introspection. In this poster we describe how our interdisciplinary group faced challenges working with unfamiliar tools and technology through a non-hierarchical, collaborative, and iterative process, seeking knowledge and skills from the maker community. We then engaged the wider community around both how and why we developed this device by exhibiting it at a Maker Faire. Our experience taught us about the making process and helped us think critically about the intersection of libraries and makerspace cultural values. We found that making is as much an act of networking as of creation.

Keywords
Raspberry Pi, makerspace, libraries, critical making.

INTRODUCTION
In 2014, Library Journal named Edmonton Public Library (EPL) its Library of the Year, singling out its makerspace as the primary reason for its selection (Maimann, 2014). The EPL’s makerspace includes a 3D printer, an Espresso Book Machine - which allows patrons to self-publish books in print format - and Raspberry Pi kits. Makerspaces are places designed to foster creation and lifelong learning through democratized access to tools and expertise. Despite libraries seeing high circulation and use numbers, critics have argued against the continued relevance of libraries, especially from the tech sector (Siegler, 2013). Thus, the inclusion of makerspaces in academic and public libraries has been suggested as a way of engaging and fostering community in the library, while demonstrating the continuing value of libraries. While there has been positive reaction to makerspaces in libraries, as demonstrated by Edmonton’s recognition, the experience of being a librarian in a makerspace context is new and therefore little explored.

BACKGROUND
In the last ten years, makerspaces have arisen out of “maker culture,” a do-it-yourself movement that encourages experimentation with materials and ideas in the act of creation. In a report, Sharples et al. explained that “maker culture encourages novel applications of technologies, and the exploration of intersections between traditionally separate domains and ways of working including metal-working, calligraphy, knitting, and computer programming” (Sharples, et al., p. 33). Learning new skills through self-directed projects is encouraged, centred on a hands-on rather than study based approach, a dynamic that Kuznetsov and Paulos characterize as “talking with” instead of “talking at” (Kuznetsov & Paulos, 2010, p. 302). Makerspaces are, quite simply, established places where people are encouraged to come make something, with the space acting to foster community involvement and networked knowledge practices as makers share expertise and materials. Shared knowledge and peer-led learning are the fundamental characteristics of maker culture and their presence is what distinguishes a makerspace from a workshop or a tool library (Kuznetsov, 2010, p. 8; Sharples et al., 2013, p. 34).

The introduction of makerspaces to libraries is a recent phenomenon, with over twenty public library systems hosting such spaces in the United States and Canada, including Edmonton, Chicago, and Idaho public libraries.
Proponents argue that libraries are a natural home for makerspaces. In a talk she gave at Atlanta Mini Maker Faire, Buffy Hamilton argued that “a makerspace culture supports the mission of libraries to enable lifelong learning and to support knowledge creation in their communities” (Hamilton, 2012, p. 12). Kelly argues that makerspaces are a kind of community programming and can be seen as an extension of library services (Kelly, 2013, p. 4). However, there are questions about how to integrate makerspaces into existing library practices and spaces and in ways that encourage the intended collaboration, shared knowledge, and peer-to-peer learning. Bilandzic and Foth argued that “the physical environment of future library and collaboration spaces must provide perceived affordances that enable users to retrieve and access information from the community of other library users” (Bilandzic and Foth, 2014, p. 81). In other words, the library must provide physical manifestations of the collaborative knowledge practices afforded by the integration of makerspaces into libraries. Libraries and librarians need to consider their role in the cultural practices fostered by adopting the makerspace ethos into the library.

In this poster we explore how becoming makers brought us to critically engage with the fundamental principles of makerspaces and to a greater understanding about what it means to both engage with and foster these spaces as information professionals.

**MAKING I.T. – BUILDING THE RAD**

Libraries are experimenting with what technologies should be included in a makerspace, how to implement them, and what the role of the information professional is in these new spaces. As new members of the library and information science community, our student chapter of ASIS&T set out to embrace the makerspace philosophy of learning through doing by programming a Raspberry Pi to deliver book recommendations at the push of a big red button. Only two members of our seven person group had any programming experience and none of us had hardware experience. The Raspberry Pi Readers’ Advisory Device (RAD) presented a significant learning opportunity, exactly the kind of project that is valorized in the maker community (Hlubinka et al., 2013, p. 34).

University of Toronto scholar Matt Ratto has been developing what he calls ‘critical making,’ which he defines as the act of material creation as a means of provoking critical reflection. In his work, making becomes a transformative process that causes the maker to reveal and confront issues provoked by new technology. For him, “shared construction itself [is] an activity and a site for enhancing and extending conceptual understandings of critical sociotechnical issues” (Ratto, 2011, p. 254). Our experience of building and programming the RAD reflected this ‘critical making’ process. This act of making caused us to reflect on what fully participating in the maker community meant and furthermore, by selecting the traditional library function of Readers’ Advisory, it forced us to critically engage with how library principles connect to maker community principles. This poster details our edification through experience and has obvious implications for understanding what it means to participate in a makerspace as an information professional.

In creating a device that sought to apply makerspace technologies to a traditional library function, we directly engaged with a point of tension between library values and maker culture. Labeling our device with the term “Readers’ Advisory,” forced us to critically engage with the library principles around traditional Readers’ Advisory - specifically, the disconnect between what we were creating as an automated and randomised device and the presumption of Readers’ Advisory as rooted in interpersonal interaction. Productive conversations arose amongst group members, some of whom are also members of a local professional organization focused on Readers’ Advisory, outside librarians, and maker community members around how the technology intersected with existing library principles and practices.

While the emphasis in makerspaces is on the community atmosphere, there are tools that are associated with makerspaces, including 3D printers, laser cutters, and cheap microcomputers (Sharples et al., p. 33, 2013); all are tools that allow users to create their own designs. We chose to use a Raspberry Pi, a single simple circuit board that can run open-source operating systems and is easy to accessorize. The affordability of Raspberry Pis make them appealing to libraries seeking to bring in the technology of
makerspaces. These aspects also made it appealing to us, as we had no previous experience with similar devices and our funding came from a pie bake sale we held.

Our creative process was highly iterative as solutions to technical problems were tried, modified, and tried again. Every step was documented and posted on social media. The approach took us out of the role of information purveyors, as it was our jobs to help and support each other through creative problem solving rather than being able to provide the path to the answer. Critical assistance came from engaging with the maker community and making connections outside our professional domain. We were challenged to accept that the process required productive failures, cross-disciplinary knowledge, and engagement from maker community members in order to reach a final product.

Every makerspace theoretically exists in a network with every other makerspace as they share knowledge and projects between interested parties (Kuznetsov, 2010 p. 8; Hlubinka et al., p. 3, 23; Sharples et al., 2013, p. 34). We consulted YouTube and blog resources of similar projects.1 A working RAD prototype was taken to a gathering of makers for suggestions, which is how our project became a collaborative one with UBC Rapid, a maker group who laser cut us a transparent case for our RAD. Making is predicated on building on the knowledge of others and contributing to the community in turn. By becoming makers ourselves we found that we inevitably ended up adapting to the social contract of the maker community by engaging with other makers. To remain isolated was unproductive as we learned from makers rather than traditional knowledge sources. Our act of ‘critical making,’ was to spread our awareness outwards and invite others into our project.

CONCLUSION

Melvin Kranzberg’s first law of technology states: “Technology is neither good or bad; nor is it neutral” (Kranzberg, 1986, p.545). The introduction of new technologies like makerspaces has consequences neither good, nor bad, nor neutral for libraries that go beyond the gadgets introduced. The most significant technology in makerspaces is the ethos of sharing: sharing ideas, sharing skills, sharing materials. Creating the RAD was a profoundly social experience. From being inspired by the work of others to asking for help both in person and virtually, our creative process was inherently open and shaped by the contributions of others. We came to embrace our project as a ‘maker’ project, rather than an academic one and our process brought us into contact with the maker community, their ideals, and their cultural assumptions. Our poster describes our experience of peer-led networked learning as an integral and transformative component of makerspaces and how those principles can be useful for creating healthy, vibrant library communities.

FURTHER WORK

Our work exposed tensions in the making process and its relationship to libraries which we plan to explore in further empirical work by installing the device in a library and soliciting survey responses from patrons. As part of the same project, we will run focus groups with library staff to gather data about the perceptions of library technologies such as makerspaces.

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REFERENCES


Figure 2. The RAD at a maker social, in its early form

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1 See Henning (2013), and Philbin (2012) as examples.
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