

3D PRINTING AND CREATIVE LITERACY: WHY MAKER CULTURE BENEFITS LIBRARIES

Sharon Ginsberg

An iPhone case. Chocolate. Custom board game pieces. A mastodon bone. A replacement knee.

What do all these objects have in common? Each is something that has been created using a 3D printer. While some of these creations will require additional work before they are viable for everyday use, the field of 3D printing is advancing rapidly and creators are finding fascinating, unique applications for the growing technology on a regular basis.



Figure 1: The Makerbot Replicator, a popular, open-source printer, surrounded by printed creations. Strands of solid resin enter the top of the printer, are melted, and are extruded onto the plate (where the completed robot is standing). Image: “The Replicator TM with Prints” by Makerbot Industries on Flickr. Used with a Creative Commons Attribution 2.0 Generic License. <http://www.flickr.com/photos/makerbot/6667803681/>

When I began my placement at the University of Michigan’s 3D Lab (a part of the university’s library system), I, like many, had only a vague sense of 3D printing and what it was capable of. The technology seemed to have a definite “cool” factor, but what purpose could it serve in the real world, I wondered, and why was I hearing about it being used in libraries? Beyond this, what was its connection to the growing popularity of library makerspaces?

The first thing I learned at the Lab was how a 3D printer works. Just as an ordinary desktop printer lays down ink on paper, a 3D printer lays down layers of material onto a build plate. There is a wide range of materials used by these machines: plastics, powders, and metals are common, while some of the more unique materials can be food or biological materials. There is even a printer being developed that may one day print using melted lunar rocks (BBC News 2012). While regular printers translate the information

contained in a text or image file into a real-world version, 3D printers translate a three-dimensional computer model into a real-world object.

It turns out the similarities between desktop printers and 3D printers do not end there. MakerBot's Andrew Pelkey quotes Wired Magazine's editor-in-chief Chris Anderson, saying that 3D printing technology has "made us all into designers. In the way that desktop publishing made us all into publishers...we now have access to design tools" (Pelkey 2012). These days, desktop printers are a standard feature in most libraries, and are generally recognized as useful not only in the library's mission to provide technology access, but also in giving patrons the power to produce, reproduce, and disseminate their ideas. Similarly, 3D printing allows for the average person's creative ideas to be fully realized and achieved, a process I observed first-hand at the 3D Lab as I watched engineering students print design prototypes or heard about the Lab staff printing custom-designed fixtures for their overhead lights.

The biggest revelation for me—and the connection to maker culture—came when I taught my webinar and in-person workshop to introduce people to 3D printing basics. I found that, although many people were familiar with 3D printing as an idea, most lacked an understanding of the technology's potential and uses. Repeatedly, I found attendees asking for additional real-world examples and wondering how to apply the knowledge to their own ideas. What these people were missing, I realized, was a kind of creative literacy.

Maker culture matters for libraries because, essentially, it teaches and promotes that creative literacy. The culture consists of makers—people dedicated to learning and sharing any type of craftsmanship skills. They value individual or small group creation, rather than mass production, and support creation over consumption. To assist with the sharing of knowledge, supplies, and projects, makers often construct and congregate in makerspaces or hackerspaces. The University of Michigan's 3D Lab expands beyond 3D printing into makerspace territory by offering services like motion capture, virtual reality, and even a digital production class where students learn the art of computer graphics. Although in many cases these spaces do involve this type of high-tech machinery, a makerspace can really be any place where people gather to create and participate in Do-It-Yourself projects, ranging from creating electronics to writing software to designing their own clothing. Makerism is not about the specific tools, but about the creation process and spirit.

I see creative literacy as knowledge that gives individuals the power to transform their ideas into reality. This is makerism at its core, and I believe this type of understanding could make all the difference for the people I spoke with during my webinar and workshop. As a whole, maker culture shifts control to the individual, helping her achieve self-sufficiency and success by giving her power over her own ideas. With makerism and creative literacy, someone with a unique vision understands her options, and can transform that notion into a solid plan. Much as patrons benefit from learning information literacy or digital literacy at the library, they could also be empowered by learning the skills, tools, and attitudes of making.

The mission of the library is not just about access, but about learning, as well, and it is for

this reason that makerism in libraries seems like such a natural fit. The Madison Public Library's Library Makers blog (2012) writes:

<begin quote>

Libraries have always had a reputation for being places of learning. Traditionally, the books housed in libraries have been perceived as the library's main purpose, and indeed books are a great way to learn. However, in today's increasingly digital world, it is important to remind the public that valuable learning also takes place outside of books and libraries are a great source of person-to-person learning experiences.

<end quote>

Maker culture plays directly into these person-to-person learning experiences—as patrons designing and experimenting in makerspaces learn from both librarians and each other—and into the library's existing goal of helping its patrons develop valuable skills.

Makerspaces in libraries also help transform many people's traditional understanding of libraries as places of consumption. Often, patrons are used to seeing the library as a source for passive materials like books, movies, and music. As libraries struggle to change this perspective, many are turning toward promoting the space as a place of active creation, as well as finding new ways to reach out to and bring together the community. In *Library Journal*, Lauren Britton (2012) writes:

<begin quote>

Incorporating Maker spaces into library service can have a life-altering impact on community members, who then have the tools, access, and training necessary to tinker with and remake their world. Just as libraries are reflections of their patrons, Maker spaces can reflect the needs and desires of the local residents. Typically, the spaces will: foster play and exploration, facilitate informal learning opportunities, nurture peer-to-peer training, work with community members as true partners, not as users or patrons, develop a culture of creating as opposed to consuming.

<end quote>

These ideas are not new for libraries; it is not unusual for them to offer technology or crafting classes or to host events that provide the community with opportunities to interact with and help each other. Therefore, bringing makerism into libraries naturally extends the library's mission to serve residents' needs by providing the training and resources by which individuals can develop important skills and literacies, and participate in their communities.

During my placement at the 3D Lab, I saw first-hand the benefits and potential of a library promoting and teaching makerism through its tools and services. Whether the technology is a 3D printer, a sewing machine, complicated circuitry, or even just a collection of assorted objects and glue, through maker culture and makerspaces, the library can help its patrons develop the necessary skills for a sense of creative literacy, by which they can take any idea from conception to creation.

Sharona Ginsberg is a second-year master's student at the University of Michigan's School of Information, where she is studying Library and Information Science. She currently works at the university library, assisting with technology workshops and providing one-on-one technology instruction. To view her webinar on 3D printing, visit <http://bit.ly/3d-webinar> or <http://bit.ly/VNMdXR>.

REFERENCES

BBC News. 2012. "3D printers could use Moon rocks, say scientists." Retrieved December 4, 2012, from <http://www.bbc.co.uk/news/technology-20542496>.

Britton, Lauren. 2012. "The Makings of Maker Spaces, Part 1: Space for Creation, Not Just Consumption." The Digital Shift - On Libraries and New Media. Retrieved December 4, 2012, from <http://www.thedigitalshift.com/2012/10/public-services/the-makings-of-maker-spaces-part-1-space-for-creation-not-just-consumption>.

Madison Public Library. 2012. "Library Makers: hands-on learning for all ages." Library Makers. Retrieved December 4, 2012, from <http://librarymakers.blogspot.com>.

Pelkey, Andrew. 2012. "What's The Dreamweaver Of 3D Design?" MakerBot. Retrieved December 4, 2012, from <http://www.makerbot.com/blog/category/scanner/3d-scanning>.