Short Communications

Makerspace Implementation and Pandemic Response

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Abstract

Makerspaces have continued to be a popular addition to the services offered by libraries. This article will address the creation and implementation of one at a mid-sized medical library. The writer will summarize their personal experience of the steps taken towards opening the makerspace and give insight into the process. This article will also address the trying times brought on by Covid-19 and the challenges faced in an operational perspective.

Background

In 2018, the Virginia Commonwealth University (VCU) Health Sciences Library, which is a mid-size library attached to the health sciences and medical campus of a large university, began discussing making and multimedia services for the library. These services would include 3D printing and scanning, virtual reality and laser cutting as well as an audio/video studio. The larger, nonmedical library in the system, the James Branch Cabell Library, has a large maker and multimedia space. That library's maker and multimedia space was very popular. It was so popular that we felt that assessing the potential value of health and medical making was important.

The two campuses are over a mile and a half apart. They are close enough for the bus or an energetic walk, but far enough that many of our patrons only engage with the medical and health sciences campus. Nevertheless, they anecdotally felt the nonmedical maker and media space had many patron visits and questions coming from the health sciences campus. To give readers a sense of the users from October 2017 through October 2020, the core campus maker and multimedia space reported 981 studio and equipment reservations from the health sciences campus (Figure 1).
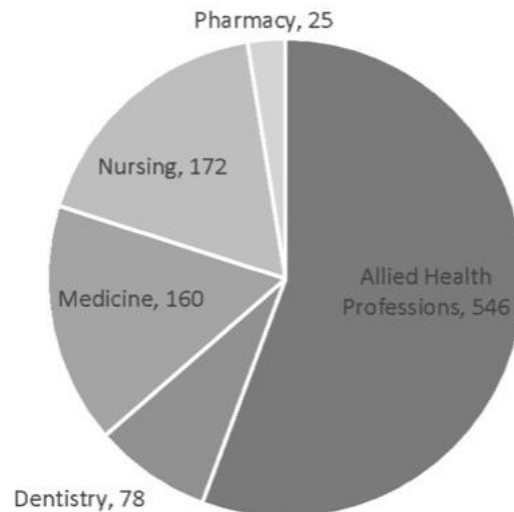
Figure 1: Health sciences reservations in core campus maker/mediaspace, 10/2017 to 10/2020

We began investigating how to provide maker and multimedia services on the health sciences campus. Equipment and tools were a popular part of the nonmedical campus' maker and multimedia services. As a result, we decided to pilot a few equipment and tool services in the health sciences library. There were other construction projects under discussion that made major renovations an uncertain topic when this discussion began in 2018. A limited pilot would help us develop a sense of whether there were requests that were uniquely fitted to the science and health sciences context.

Developing the Makerspace Service

3D printing is an important part of making, and also one of the more training- and support-intensive parts of a makerspace. The library acquired the means to purchase a 3D printer. After some shopping around and discussion with the core campus library's makerspace, we decided to purchase the LulzBot Taz 6. I would like to give you a sense of the experience:

> I vividly remember the day I received the cumbersome box containing the printer, I was excited and there was an air of enthusiasm amongst the staff. The machine had various parts and pieces but assembly was quick, I had already downloaded the program, Cura, to set up the very first print. After the expedient set up the machine whirred into action going to work printing the recommended test print called the Rocktopus, an octopus with a tentacle raised in the "rock on" hand sign. The printer kept on buzzing and building, sounding like a mechanical sing song; this process would take about thirty minutes until the product was finished.

The finished product wasn't as clean nor as perfect as one would think, and the process by all means is not instantaneous. We had a sense that there is an alchemical mystique to 3D printing, turning a strand of filament into an object. When patrons saw the printer moving, they would come to watch, asking about the process and handling sample prints.

We and the patrons were enthralled by the concept and expected no less than perfection. But the 3D printer is certainly not a replicator from Star Trek that instantly produces a finished good. It is a tool that needs to be learned and skillfully manipulated, sometimes thoughtfully coaxed, with various settings and programs to first be learned. Going forward, we knew we were going to have to mediate patrons' expectations of the capabilities of the printer.

Our rollout strategy for the 3D printer was a soft launch. We moved forward with a submission-only process, where patrons could send in requests for printed objects. We wanted broad experimentation so we subsidized the filament costs, allowing free printing. To manage capacity, we placed limitations such as the amount of time the object took to print. We set the limit at five hours, and a user could not submit more than one print at a time. We offered a plethora of colors that patrons could choose from and linked the websites for object databases from the National Institute of Health and Thingiverse.com, a free to download user submitted website. We hesitated on creating any advertising because we didn't know what the initial demand would be like, we wanted staff to feel comfortable with the process before making the services widely known.

At first there weren't too many submissions and interest in the printer was from passing patrons who were curious about the machine. At this time the 3D printer sat alongside the service desk while we were still in the process of renovating our makerspace where it would eventually call home. Slowly but surely more submissions came in and they varied in "topic"; some were medical themed, many were not (Figure 2 and Table 1). We wanted the patrons to feel like they could submit anything (policy limits permitting). We wanted them to be able to search and find objects and frankly just have fun. Not only were the patrons learning new skills but so were the staff, and there was certainly a learning curve to overcome with these new technologies. Frustration and excitement was a daily roller coaster of emotions the staff rode as they figured out by trial and error how to print objects and work the software. In brief, here are a few variables we consider when printing: temperature, supports (what holds the object's floating surfaces to the base), filament type, and speed.
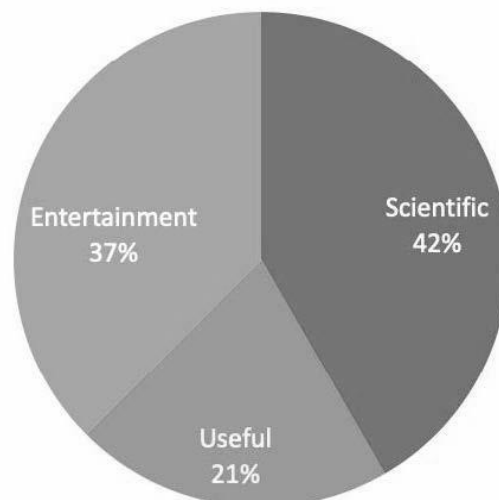

Figure 2: Category of 3D print request (in percentage)

Table 1: Count of 3D print request (by category)

	Scientific	Useful	Entertainment	Grand Total
Number of Requests	20	10	18	48

We also began circulating select multimedia equipment, in order to get a sense of which media functions had the most health science campus interest (Table 2). That served three functions in our pilot – providing the equipment, giving us data on equipment collection priorities for the future, and giving a sense of potential media space demand for future possible renovations.

Table 2: Usage of select multimedia equipment

Equipment Types	Two-Year Usage
Digital SLR Camera	144
Camcorder	84
Projector - Epson PowerLite	46
Podcasting Kit	23

Looking at these numbers, we learned that there was high demand for cameras and camcorders. Multimedia projects with images and video are important, more than audio-only equipment. That means that our pilot audio studio space needs to include software to support voiceover recording and other audio enhancement projects as well as audio-only projects. Furthermore, a pilot multimedia space will be worth investing in, to allow processing and designs that take full advantage of higher-resolution tools like SLR cameras. It also told us more broadly that equipment continues to be interesting and that our patrons want to experiment with digital technologies in our physical space.

Finally in the summer of 2020 we were able to open our makerspace. As the renovations were finishing up, we acquired a few more pieces of equipment: a VR headset, a 3D scanner, a laser cutter, powerful computers, workbenches, and mobile furniture. Interest began to grow and grow; we started having one staff member on call each day to show patrons how to manipulate the machines.

> I for one loved this, I like showing patrons how to print their objects and leave them to their own devices, one patron printed a 3D baby yoda and without any pressure from us posted a photo of it on their Facebook. Word of mouth quickly spread people started coming by asking how to print a baby yoda and once they were there they would check out the other tech.

Arrival of COVID-19

Then the unthinkable happened with the arrival of COVID-19. We halted everything, the building was shut down and we closed down the makerspace. At the time of this writing the situation has not changed and we do not see it changing anytime in the near future. We still accept submissions, but this technology is more hands-on than virtual, requiring trial and error to truly learn the technology and its limitations. We hope that this once in a lifetime occurrence

does not totally halt the interest in and development of these services. We have continued to acquire more technologies, such as additional cameras, to help with their high demand. The hope is eventually, despite these unforeseen setbacks, we will reopen the makerspace and begin anew. We will continue to drive and inspire the creativity and innovation of our population. We will continue to seek new opportunities for equipment and in the meantime, adjust policies and procedures to comply with health and safety standards. Some steps that are being made to reopen the makerspace are being discussed in various work groups. These work groups will make decisions on how patrons will access the equipment, and how that equipment will be cleaned and sanitized. Patron safety is paramount to the functioning of the makerspace and its equipment. In the fall semester we hope to see these policies implemented and patrons able to once again use our makerspace services and resources.