

The “Stone Soup” Approach to Creating a Library Makerspace

Students acquire, communicate, share and create knowledge through more than the printed word, and libraries are in a position to provide equitable access to a variety of multimodal resources enabling students to do so. Embracing this mission, one medium-sized public academic library was determined to open a makerspace. How does a library in a state with well-publicized and major budget cuts to higher education manage to do this? Through collaborative relationships, using and creatively repurposing what it has, and intentional communication. This article describes one library’s process in gauging interest, soliciting support, and successfully implementing a makerspace. It focuses on communication strategies used to manage perceptions of such an audacious undertaking in a climate of austerity.

Keywords: makerspaces, digital studio, collaboration, technological innovation, academic libraries

Introduction

In the popular folktale, *Stone Soup*, travelers--poor and hungry--arrive in a village, asking for food. When the villagers decline, lamenting their own meager provisions, the travelers set about making ‘stone soup.’ They put a stone to boil in pot of water and share their vision of what this soup will become. The villagers begin contributing a carrot here, a potato there. Soon they do indeed have a delectable soup that all can enjoy. The process is not unlike the one that an academic library in Wisconsin used to create a library makerspace, where a perceived lack of resources made the realization of such an undertaking dubious. However, by communicating a vision, identifying and maximizing existing unused or underutilized resources, and soliciting

contributions of expertise and funding from a range of individuals and organizations, they created a makerspace against all odds.

Audacious thinking

A well-publicized and unprecedented \$250 million budget cut in 2015 accompanied by tuition freezes ever since, spelled budget crisis for the University of Wisconsin System. The University of Wisconsin-Eau Claire McIntyre Library, serving a campus of 10,000 students, absorbed a 25 percent reduction to its overall budget, mostly in staffing but also 11% to its materials and supplies budget. McIntyre Library was hardly in a position to dream big. At the same time, the NMC Horizon Report cited makerspaces as an important development in educational technology for higher education, predicting time-to-adoption at two to three years (Johnson, Adams Becker and Estrada 2015, 40). Interest in do-it-yourself (DIY), making, or the “tradition of tinkering” was experiencing a renaissance of sorts following the economic crisis in 2008. (Lahart 2009)

Libraries, doing what they always do, were responding to community needs and interests. Libraries began offering access to spaces, equipment, technology, supplies, and training to support and inspire this growing trend. Makerspaces--already gaining a foothold in public libraries--were beginning to appear in a few academic libraries. (Radniecki and Kenke 2017)

John Burke, in his book, *Makerspaces: A Practical Guide for Librarians*, describes makerspaces as taking “libraries on a path related to their traditional role of sharing expensive resources to increase knowledge but this time toward releasing the potential of patrons to create.” (2014, 2)

Defining Makerspace

Definitions of makerspaces are as wide-ranging and varied as the implementations of the concept. A makerspace is usually some combination of space, tools, technologies, supplies,

expertise, and community, but not necessarily all. In keeping with the folktale analogy, a makerspace can be anything from a grand palace, such as Case Western's multimillion dollar, 7-story Sears [think]lab outfitted with state-of-the-art prototyping and fabrication equipment, intellectual property and legal assistance, and robust community connection (Case Western Reserve University 2020) to 'one's own little corner' such as the University of Las Vegas Lied Library Tech Corner (Schuck, et al. 2017). A makerspace may not be a space at all. Some libraries accommodate makers by creating mobile makerspaces (Gierdowski and Reis 2015), checking out equipment and tools through 'libraries of things' and maker kits (Robison and Shedd 2017), or offering maker programming. How makerspaces manifest themselves is a function of budget, demand, space, staff, and receptiveness of the community--or campus--to the idea.

The maker movement caught the interest of McIntyre Library staff who had been following the growth of makerspaces, primarily in schools and public libraries. Rather than becoming discouraged that the dire budget situation would make such an initiative prohibitive for the university library, staff believed that economic hard times offered a context that spoke to the value of a makerspace. Its focus on innovation and entrepreneurship, combined with its core mission of sharing access to often costly tools, resources and expertise, strengthened the resolve of library staff. Perhaps this was the ideal time to promote the idea.

Gauging interest/feasibility

The first step was to gauge receptiveness to the idea of pursuing a makerspace within the library. While some library staff were enthusiastic about the idea, others were skeptical. Some expressed concern that library makerspaces were passing fads. Others were concerned that the idea was frivolous and could detract from the mission of an academic library. Several were concerned

about how such an idea would be received both within and beyond the campus community at a time when the university was under intense public and political scrutiny. And there were those who supported the idea, but thought the current financial circumstances made any action untenable. Undeterred, the library systems coordinator – driven by some of the very qualities that define makers, such as a proclivity for experimentation and innovation, a willingness to risk failing, and a learn-by-doing disposition – continued advocating. In summer of 2016, he received director approval to explore the feasibility of developing a library makerspace.

Create an exploration task force

A Makerspace Exploration Task Force was formed by soliciting volunteers among the library staff who had interest or expertise. Five library faculty and staff members stepped up, each bringing unique areas of expertise, including technology, crafting, sewing, game design, and academic liaison responsibilities and curriculum integration experience. Recognizing the importance of representation beyond the library, four additional members were recruited. Faculty members from the art and computer science departments, the university videographer, and the student director of the student senate Information Technology Commission joined the task force. These members were strategically identified, not only for the unique perspective and expertise they could bring to the table, but also for their enthusiastic dispositions and potential to build support across campus for the initiative.

Possibilities, principles, priorities

The goal of the Task Force was to assess interest among faculty and students for a campus makerspace, and subsequently to create a proposal for creating one. In early meetings the group

identified principles that would guide their work. They agreed that a makerspace should prioritize:

- Sustainability: Emphasis should be placed on reusing, repurposing, and recycling materials.
- Training and education: One-on-one instruction, group workshops, training, and integration into the curriculum would be essential for success. Learning in the makerspace should prioritize creation and experimentation over consumption of information.
- Democratization of access to resources: Resources should be freely available to all students (regardless of major), faculty and staff, to the extent possible.
- Community: A makerspace should be more than space and equipment; it should facilitate interaction, collaboration, and a sharing of skills and ideas.

The task force met monthly during spring 2017 and completed a proposal in July 2017. The proposal communicated the vision for a makerspace, including a definition and description of how students and the campus could benefit from such a resource. It included a plan that outlined what the library would be contributing to the effort, and an estimate for both a startup and ongoing budget. (Appendix 1) The proposal was submitted to the library director as a document she could use in expanding awareness of the project and soliciting support.

Soliciting support

Soliciting support was twofold. First the library needed to generate and identify support for the idea. That in turn would help in building a compelling case in soliciting financial support.

Faculty

The Task Force proposal was shared with and discussed among library faculty, who each serve as liaisons to academic departments. During the summer of 2017, library faculty reviewed the proposal, consulted the literature on makerspaces in college settings, and began collecting examples of academic applications of makerspace resources. (Mekolichich and Wirgau 2017) (Lawrence University n.d.) (Pope 2017). During fall semester 2017, library faculty used their professional networks and interactions to spread the word that the library was interested in creating a makerspace and to begin gathering input on the idea. Through the library's email newsletter, librarians invited faculty across campus to a makerspace interest meeting. In a chance meeting during the 2017 total solar eclipse viewing on campus, the library director made the acquaintance of a new math faculty member, who – it turns out -- had several 3d printers, considerable expertise, and a passion for making. This faculty member would become instrumental in the development and promotion of the space. Fifteen faculty, representing 11 distinct departments and offices, including art, math, English, materials science, and computer science, joined library staff to form a Makerspace Interest group. Members of this group shared reasons for their interest in the project, what they would most like to see in a makerspace, curiosity about what the library was planning, and even mild concern that the library might duplicate resources already available on campus. Both their interest and their concerns helped the library better craft its message. The members of the interest group would serve as ambassadors for the idea within their disciplines.

Students

While library staff were growing and assessing enthusiasm among faculty, they wanted to do the same with students. Employing the theory that showing is more effective than telling, they borrowed 3d printers from the aforementioned math faculty member and set up demonstrations

in the student center. The novelty of the 3d printers captured student interest and drew them in. Librarians were then able to talk with them about makerspaces, ask them what they would like to see in such a space, and invite them to sign a petition in support of the library plan to create one.

Library staff also engaged student senators. Representatives from the Student Office of Sustainability (SOS) and the student Information Technology Commission (ITC) were particularly interested in the proposal. Both groups are responsible for making recommendations to the Senate regarding the distribution of portions of the student segregated fee budget. Both groups encouraged the library to present a proposal to their bodies.

The library approached these presentations in the way one would any funding or grant proposal. They attended student senate and commission meetings ahead of time to get a sense of their decision-making processes. They reviewed the student senate bylaws to better understand the funding criteria used in allocating funds. According to the bylaws, the student technology fee, managed by the student ITC, “is intended to provide students with additional services and should not replace existing funds intended to support student technology,” and “funding should concentrate on areas that visibly benefit all students.” (University of Wisconsin-Eau Claire 2018, 76) The library was confident that they could make a strong case for the makerspace emphasizing these criteria, as the makerspace would be a new initiative available to every student on campus. The Student Office of Sustainability manages a ‘Green Fund,’ used to “foster sustainability in our campus community through innovation, education, and foundational improvements.” Further, they define sustainability as “the intersection of environmental health, economic prosperity, and social wellbeing.” (University of Wisconsin-Eau Claire 2020) The library’s proposal to this group emphasized the reuse, repair, and repurpose aspects of the makerspace. The proposal emphasized workshops for students that promote sustainable practices

by teaching lifelong skills that reduce and prevent waste. It described the library's goal to provide the tools and expertise needed to teach students how to fix things that are broken, repurpose traditional waste items into new creations, and make new reusable items from sustainable materials. It also spoke to the contributions that creation, innovation, and community make to social and economic well-being.

The library developed a more detailed budget, offering different funding level 'packages.'

Package A (\$33,471.38) included items deemed necessary to create a functional makerspace.

Package B (an additional \$9218.50) included additional materials and equipment that were not necessarily essential to get started, but that would be nice to have now or later. Package C (an additional \$29,241) contained higher-end "wish list" items, such as a laser cutter, a 3d scanner, and music recording equipment. Recognizing that the student groups were unlikely to fund ongoing expenses such as staffing, those expenses were not included in the proposed funding options. The library posted proposal documents, along with links to examples of other university makerspaces, on a website (<https://lib.uwec.edu/MakerspaceProposal>) for easy and transparent access.

The two student groups voted enthusiastically to provide funding, splitting the cost of Package A, startup costs for creating a proof-of-concept functional makerspace. As a result, 2018 marked the disbanding of the Makerspace Exploration Task Force and its replacement with a Makerspace Implementation Task Force.

Donors

As library staff were working with faculty and student groups, the library director was also sharing the makerspace vision with the campus advancement office, ensuring that they were

aware of the project when they met with potential donors. The library provided advancement staff with a copy of the proposal. As plans coalesced and funding came in from the student groups, the advancement office was kept apprised. Their interest in the project increased once the library had something to show – student commitment to provide start-up funding and a functioning space.

From idea to implementation

The generous support of the student groups was just what the library needed to move from stone to soup, but it would benefit from additional ingredients.

The library's determination of what it would provide in the way of space, staffing, and supplies for a makerspace was ambitious. In committing to creating and managing a makerspace in an environment with flat staffing and budget, the library had to look at itself holistically and honestly. In assessing its metaphorical pantry, the library identified what it could contribute to the 'soup.'

Space

Like many libraries, McIntyre Library had abundant space as a result of the decades-long trend of collections moving to electronic format, the weeding of outdated materials, and reductions in staffing resulting in diminished need for office space. The library determined that it had ample real estate for a makerspace; what it lacked was funding to renovate the space. The library considered both the option of pursuing funding for a major facilities renovation to accommodate a state-of-the-art makerspace with room for expansion, as well as the option of making do with an existing 'good enough' space. To ask for significant funding to renovate and create an ideal space would be a longshot, and it threatened to delay the project indefinitely. Instead, the Task

Force and library administration proposed using a modest imperfect space that would require little in the way of renovation. It could serve as a proof-of-concept, they reasoned. The space, a former staff lounge turned storage room, was in the basement, at the end of a dark hallway. It was small and hard to find. But it had a locking door, cabinets, a closet, and most importantly, a sink. It required little more than removing old carpet and polishing the concrete floor beneath, slapping a little chalkboard paint on the peeling cabinets, and updating power and data, to get started.

Staffing

How could the library possibly commit to staffing and providing support for a makerspace when it had lost positions in recent years and would be unlikely to add new ones? By employing a stone soup solution, of course. All library faculty and staff were invited (not required) to join the makerspace team. Those interested agreed to carve a minimum of two hours out of their work week to staff the space and attend meetings. Supervisors were encouraged to allow interested staff to participate. Several staff members were excited by the opportunity. They saw it as a break from their routine, a way to incorporate their creative skills and interest into their work, an opportunity to learn new skills, and a chance to work with colleagues from other library departments. All who were interested found that they were able to reprioritize responsibilities to carve out two hours a week. Some staff, of course, would contribute more. The library systems coordinator would assume the management role of the makerspace. The recent implementation of a shared library services platform in the University of Wisconsin System centralized some of the support and maintenance responsibilities previously carried out by local library systems staff. The systems coordinator was able to shift some focus to developing and managing a makerspace. By the time the makerspace opened, six library faculty and staff members (of 25) comprised the

makerspace team. It is worth noting that the opportunity to not only participate but also serve on a steering team for the makerspace was empowering to library staff. The staff who chose to work in the makerspace reported finding more satisfaction in their jobs, given the opportunity to create and work on something they found meaningful.

Throughout the planning year, the library was experiencing a change in leadership. The library director retired in early 2017, when the Makerspace Exploration Task Force was just forming. A library faculty member was ultimately hired into the director position, leaving her previous position vacant. Rather than backfill the position as it was, the library took the opportunity to restructure the staff, reassign responsibilities, and create a new library faculty position with some makerspace responsibility. The new digital learning librarian position would become part of the makerspace team and would assume a leadership role in connecting makerspace and digital technologies to the campus curriculum.

Supplies

The dark cloud of the university's budget cuts had resulted in eliminating an art education program. This was a devastating development for the art department, students, and art education in the state. But the timing of the program's demise had a silver lining. The art department had to get rid of myriad art supplies and equipment. An art faculty member who had been a member of the Makerspace Exploration Task Force, offered them to the library for the makerspace. This influx of supplies expanded what would be available for students at the outset, it filled the makerspace shelves with an array of materials for creating, and it eased the pain experienced by art faculty heartbroken by the loss of their education program. They were consoled in knowing that the supplies would continue inspiring and enabling students to create.

In keeping with the necessity to be cost conscious and its commitment to sustainability, the library sought and continues to seek opportunities to reclaim and reuse supplies rather than purchasing new. Key to the success of this approach is ongoing and widespread communication with individuals and departments about what the library is doing and what it needs:

- Library staff regularly monitor stock in the campus surplus store, which offers free reclamation of surplus property for departmental use. Through surplus, the library acquired worktables and chairs for the makerspace. They didn't have to be new or stylish, just sturdy. When the library was pricing the purchase and installation of fume hoods, they communicated with campus facilities staff. Facilities has just removed a fume hood from another building and offered it at no cost to the library. It too was neither new nor shiny, but it was functional.
- Early in the planning process, library staff connected with a math faculty member who was teaching math concepts through quilting. Staff had reached out to her to both tell her about the makerspace plans and to seek her input on a sewing machine purchase. She had successfully acquired several machines, a collection of fabric, and sewing supplies through grants and donations from the local sewing community. When she retired a few months later, she asked that her sewing lab be given to the library makerspace.
- Library staff have gotten into the habit of considering whether materials and equipment can be used in the makerspace before discarding them. When a whiteboard was removed from a renovated classroom, it found a home in the makerspace. Like any library, McIntyre Library has a steady supply of weeded materials. Maps, books and CDs have been recycled in a variety of workshops. Similarly, shelving and map cases have been

repurposed into makerspace storage. Underutilized lockers from elsewhere in the library were moved to the makerspace for students to store projects in progress.

- In communication with various groups and stakeholders about the makerspace, the library solicited donations of supplies. In summer 2017, before the opening of the makerspace, two library staff members presented workshops at a university staff conference. One workshop was on hand lettering and bullet journaling, and the other was a creative problem-solving team event using materials one might find in a makerspace. At both sessions, presenters promoted the upcoming opening of the makerspace and welcomed donations of supplies that people might have at home. As a result, the library received generous donations of fabric, yarn, knitting supplies, decorative scissors, and other craft supplies. An art faculty member who once discarded high-quality illustration board rectangles--the 'insides' byproducts from her students' art matting projects--now saves them for the makerspace. In the fall 2018 biannual newsletter distributed to faculty, staff, donors and emeriti, the library included a "Makerspace Wishlist," identifying items large and small needed in the library. (Hillis 2018, 5)
- The library experimented with a call for specific donated materials as well. It held a t-shirt drive, promoted as a sustainability initiative, through which 170 t-shirts were collected to use for upcoming makerspace workshops.

Communication

Critical to the success of the stone soup approach to creating a makerspace was continued communication. The library was balancing messages to manage sometimes seemingly contradictory perceptions. Library staff were attempting to build awareness and enthusiasm, while at the same time quelling concerns that the library was straying from its central academic

mission; the library wanted to engage students with ‘fun’ programming while at the same time demonstrating the academic potential of the makerspace. The library wanted to demonstrate that the makerspace was a financially viable undertaking while continuing to solicit additional funding and support.

Managing of perception

Developing a new major resource like the makerspace while simultaneously cutting library databases raises eyebrows. Library staff were acutely aware of risking the perception that the library’s new initiative was coming at the expense of books, databases, or other things that libraries ‘are supposed to do.’ They were equally aware that some might view the makerspace as nonessential, frivolous, or out of scope. Library communication from the inception of the idea, through implementation and forward focused on three messages:

- Makerspace is an example of libraries doing what they have always done. It is another iteration of providing equitable access to shared resources. In a promotional video created by the campus marketing department, makerspace is introduced in the context of other library services. The video emphasizes the message that despite predictions of its demise, libraries persist because they adapt in how they make available to students the resources they need to learn, explore and be successful. (University of Wisconsin-Eau Claire 2018)
Makerspace is named as one of several services contributing to that outcome.
- Makerspace draws additional funding to the library. Addressing concerns that the makerspace is diverting funding from core library collections, library staff make a point to acknowledge the funding from student organizations in communications and discussions. The message is particularly important in communications with faculty, also weathering budget reductions and justifiably concerned about library book and journal

collections. An article in the library newsletter, distributed to all faculty and posted online, introducing the space states, “The funds to create the space were provided by the Student Office of Sustainability (SOS) and the Information Technology Commission (ITC).” (Hillis 2018, 4) Similarly, email communication between library liaisons and faculty, and announcements made at university faculty and staff senate regarding makerspace acknowledged the funding sources.

- Makerspace offers a solution in economically challenging times. Turning the notion that a makerspace is a frivolous undertaking in austere times on its head, the library communicated the value of a makerspace in sustainability and economic terms. The library promotes the financial advantage of sharing rather than duplicating costly resources across campus. For example, the art and math departments, each with interest in providing their students with access to a laser cutter, were unable to purchase their own. The materials science department had one, but it was limited to use by students in that department. Through collaborative efforts – and the library’s guarantee that shared equipment will be available to all students and thus have greater impact – the library was able to make a more compelling case for securing funding.

Programming

The library was also intentional in communicating the value of the makerspace in programming choices. Library staff had known from early on in the planning that they wanted to have a grand opening event but were uncertain what that would be. Again, a serendipitous conversation provided the answer. The Eaux Claires music festival, a project of hometown music celebrity, Justin Vernon of the band Bon Iver, provided the venue for a conversation that would inspire an idea for the grand opening event. The music festival featured art installations in addition to

music. One artist featured at the summer 2017 festival was a recent UW-Eau Claire music composition graduate turned installation artist and self-described maker. The library director, who knew him as a student, stopped by his art installation. When he mentioned that he was using the Arduino electronics platform for his installation, the discussion quickly turned to making and makerspaces. The artist talked about his path from being a musician to making his own instruments to experimenting with sound and art. He was delighted to hear about the library's emerging makerspace plans. A year later, library staff invited him to be a guest artist featured at the grand opening, where he offered a presentation and a robot-building workshop. Not only did he epitomize the intersection of the arts and technology that the makerspace developers envisioned, but he was an alumnus who embodied the University's tagline, "The Power of And," encouraging students to explore and connect multiple interests. The library was confident that the campus marketing and alumni offices would be interested in covering his visit, and indeed they were. They created and posted a video featuring the grand opening event and the guest speaker, thus amplifying the visibility of the event and the makerspace. (Wermund 2018) . The grand opening event garnered local media attention for the makerspace as well. (WEAU 13 News 2018)

The makerspace doors opened fall semester 2018, and while intellectually staff knew not to expect hordes of students immediately, some were admittedly discouraged by the meager number of visitors to something they were so excited about. They knew that it could take time for word to spread and for curricula to evolve to incorporate the new resource. They also knew that they had to actively promote the service, both to faculty and students, and give them a reason to take time out of their busy lives to visit. The makerspace team developed a series of introductory workshops, aiming for balance between 'crafty' workshops and 'techie' workshops,

recognizing that if the makerspace were too closely identified with one or the other, they risked losing interest among populations for whom that particular aspect of the space held little appeal. The workshop topics were largely driven by the interests and abilities of the library staff as well as the library's commitment to sustainability. During the fall 2018 semester the library offered 22 workshops, nearly doubling that number to 41 offered the following spring. More than 1100 students, faculty and staff attended the 61 workshops – with 40 unique descriptions -- offered in the first year (Appendix 2).

Gathering and telling stories

As people discovered and started using the space, library staff began collecting stories. Examples of how individuals and groups used the makerspace to pursue individual interests, solve problems, teach lessons and build community comprised a powerful communication toolbox.

Examples of problem-solving stories include:

- During the week of Homecoming, the campus mascot (a birdlike creature) experienced a wardrobe malfunction. In a panic over a broken zipper, the mascot came to the makerspace for an emergency repair. The makerspace, the library shared on social media, saved Homecoming!
- A student used the 3d printers and design software to prototype a device for use with a longboard that he hopes to patent.
- Students taking up the hobby of rock climbing on a budget used the makerspace to make their own chalk bags.
- Library staff, in learning to use the technologies and embracing the DIY and repair ethos, have used the 3d printers to create parts to fix broken tape dispensers and

computer keyboards, used power tools in fashioning brackets to mount computer monitors and whiteboards, and used the vinyl cutter to address library signage and wayfinding challenges.

The collected stories and examples enable the library to make more compelling cases to potential donors, and they stimulate ideas among faculty of how they can incorporate this resource into their classes. Makerspace staff set up a spreadsheet in which they collect stories and testimonials that the library can draw upon for communication and promotion.

In the Stone Soup tale, villagers began contributing more ingredients once they began smelling the broth and believing that the plan was indeed attainable. The collected stories enabled the library to reach out to past and potential new donors for continued support. Whereas initial requests for start-up funding required a leap of faith--much like stone soup—once things were simmering and there was a successful proof-of-concept, the library was in a stronger position to solicit contributions.

The university advancement staff value stories of impact. In spring 2019, they assisted the library in setting up a makerspace advancement fund and running a trial crowdfunding effort that raised \$1000. They continued sharing stories with potential donors, and one responded with funding for a laser cutter, an item from the initial wish list.

Throughout the year the library shared stories and updates on progress with the student groups that provided the initial funding. A year later, the library went back to them with additional requests. To the student Information Technology Commission, the library made a pitch for \$55,000 to fund a digital studio, which comprised and expanded on the unfunded elements of the original makerspace “Package C” proposal. The student ITC funded the project, and

implementation is underway. The Student Office of Sustainability, impressed with the array of sustainable workshops offered during our first year, provided funding for workshop supplies into the second year.

In addition to using stories to elicit financial support, the library is using stories to encourage faculty engagement. Initially the library's communication with faculty was to invite them to tour the space and to ask what they would like to see in the space. While some faculty expressed interest, the library started experiencing a greater level of interest and engagement among faculty once communication efforts started including stories demonstrating how colleagues were using the space. Stories were included in library faculty newsletters, emails, and conversations. Early examples included:

- A music history instructor had her students build operational transistor radios.
- An art professor introduced her sculpture students to 3d printing.
- A game design class used makerspace resources to design and create game pieces.
- Language faculty had students practice secondary language skills by instructing classmates in a craft project.

In reaching out to both students and faculty, library staff found success in a 'reverse tabling' strategy. Rather than staffing a table at events to promote library resources, library staff now attend events to visit tables staffed by others. They ask questions to learn more about organizations and initiatives, and suggest how library resources can support them. For example, rather than staffing a table at a student organization festival at the beginning of the year, hoping that students will approach the library table, library staff now visit the other tables, meeting and talking with students representing student organizations. Librarians tell students about the

makerspace, suggesting specific ways they might make use of the makerspace. Some groups have acted on the suggestions to hold group team-building events or make buttons to represent their groups in the makerspace. Similarly, librarians attended a campus faculty event showcasing high impact teaching practices. One librarian learned about a community outreach program administered through the communication disorders department in which students conducted home visits with people with aphasia. Students had to design activities for these home visits, often arts or craft activities. The librarian suggested to the faculty members overseeing this program that they refer students to the makerspace as a resource for designing those activities. The faculty members were receptive and enthusiastic. They had heard about the makerspace but had not yet made the connection to how it could be useful to their students. Had librarians been staffing their own table rather than visiting the other tables, this conversation would have never occurred.

Conclusion

Against the odds McIntyre Library was able to create a modest makerspace by piecing together resources and funding. The library used small successes to leverage further support, thus growing the endeavor incrementally. Maintaining and expanding the offerings will require more of what got them to this point: continuing multifaceted communication efforts, seeking out mutually beneficial collaborations and financial support, and thinking creatively about how to use what they have at their disposal.

In addition to continuing with current traditional communication methods, including social media, website, newsletters and news releases, the library is experimenting with additional modes of communication.

- They recently worked with a campus videographer in creating a promotional video to air on the student-run television station and prior to movies in the campus film series (https://cdnapisec.kaltura.com/index.php/extwidget/preview/partner_id/2370711/uiconf_id/42910141/entry_id/1_hasbf7g/embed/dynamic).
- They are experimenting with using an annual overarching theme for all library communications efforts. The 2019-20 theme is “Create with Us,” inspired by the up-and-running makerspace and the up-and-coming digital studio.
- The library is serving as a client for a market research class, whose spring 2020 project is to develop a market research report exploring factors that motivate or demotivate students to engage in creative learning activities in the library makerspace and digital studio.

Unlikely to see an increase in the base budget any time soon, the library recognizes that maintaining and expanding these resources going forward will require continued effort, creative ideas, effective collaborations, and careful stewardship of resources. To that end, they are:

- Launching a new advancement initiative, McIntyre Valued Partners (MVPs), to grow their cadre of library supporters. Access to the makerspace will be among the membership incentives offered.
- Restructuring staffing. In the past year, the library combined its reference and circulation service desks, and eliminated some low-use library hours, freeing up student staffing hours. They have begun using student staffing to extend the hours that the makerspace is open. From an original 26 hours per week, the makerspace is now open 35 hours per week, including more evening and Friday hours to meet demand.

- Crowdsourcing training. As the library prepares to open the digital studio, they are contacting campus experts, many of whom have provided advice in the purchase of equipment, who are responding with enthusiastic willingness to provide train-the-trainer instruction for library staff in the technologies that will be available.

The journey from idea to implementation of the makerspace was necessarily incremental. It relied on a tireless advocate, amassing a team of creative and resourceful individuals dedicated to the vision, detailed planning, and the dexterity to stray from the plan when necessary to take advantage of unanticipated opportunities. Though our instinct may be to hunker down and weather challenging situations, audacity in the face of austerity can serve to promote collaboration toward a common good. Contrary to an old idiom, many cooks can make great soup.

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McIntyre Library Makerspace Proposal

What is a makerspace?

A makerspace is a place where people come together to create. It contains shared high-tech and low-tech tools and resources. It is a community of experts and novices, sharing ideas and knowledge to inspire the creation of physical items and digital content.

What is our plan?

- We will renovate a room in the McIntyre Library and purchase furniture
- We will purchase basic and advanced tools that facilitate creation
- We will stock basic materials—offering small quantities at no charge
- We will staff the makerspace with student workers and Library/University faculty/staff when possible.
- We will work with Library/University faculty/staff as well as student groups to hold events and classes
- We will work with University faculty to incorporate makerspace projects into the curriculum
- We will work with students to complete their own personal and class projects

How do students benefit from a makerspace?

- Opportunity to develop lifelong and marketable skills
- Gain familiarity with state-of-the-art technologies
- Access to tools and expertise for personal and class projects
- A community. Opportunities for social and creative interaction
- Opportunities for collaboration, exploration, and experiential learning
- Prototyping for entrepreneurs/startups

How does campus benefit from a makerspace?

- It supports our mission to foster creativity in one another
- It provides us with stories of innovation to tell that will be attractive to potential students and donors
- It allows us to be competitive with schools that are already offering these spaces
- Increasing student involvement in extracurricular groups and activities will increase retention
- By providing *all* students with access to technology and resources, a makerspace supports our commitment to equity and inclusivity
- It creates an avenue of success for students who learn best when provided an opportunity for hands-on learning.

What can you do in a makerspace?

Sample Projects

- Lego robot
- Laser-cut and 3D printed art
- Arduino controlled LED cube with a USB interface

Sample Classes and Events

- Introduction to 3D modeling
- Make your own guitar effects pedal
- Build an interactive Halloween costume
- Learn Arduino programming
- Balsa wood bridge building competition
- Open source hardware and software: What's it all about?

What are we asking for?

Startup budget

\$20,000 - Renovating space and purchasing furniture

\$40,000 - Purchasing equipment

Ongoing budget

\$16,000 – Staffing/materials/equipment repair

What do we want to provide with this budget?

Space

- Whiteboards
- Projector
- Sink
- 4 work tables, 1 instructor/work table
- Air filtration
- 3 computers

Equipment

- Laser cutter
- 3D printer
- 3D scanner
- Fume hood
- Hand tools (screwdrivers, wrenches, etc.)
- Power hand tools (drill/driver, Dremel, etc.)
- Electronics (power supplies, oscilloscope, etc.)
- Fabrics (sewing machines, cutting mats, etc.)
- Crafting (vinyl cutting machine, button maker, etc.)
- Art (paints, easels, etc.)
- Digital Art (Wacom tablet, Adobe software, etc.)
- Audio (podcast recording studio)
- Robotics (Lego Mindstorm)

Support

- Regularly scheduled classes and events
- Access to subject experts and equipment training
- Clearinghouse of other related resources on campus

Blugold Makerspace Workshop Descriptions

3D Printed Lithophanes: Learn how to 3D print a lithophane of your favorite photo. We will teach you how to take any image and transform it into a 3-dimensional representation to share with the world. Makes a great gift for family and friends!

3D Printers & Repairs: Learn how to use 3D printers as a tool for repairing broken items! In this workshop we will explore the steps you can take to find 3D models, or even build your own, to extend the life of your broken treasures. We have used these techniques in McIntyre library to repair tape dispensers, create legs for keyboards, & replace missing board game pieces.

3D Printed Accessories (Halloween): Use existing 3D models and a little imagination to accessorize your costume for some flavor

3D Printing 101: Do you know absolutely nothing about 3D printing, but are interested in learning? Join Makerspace expert, Brad, in exploring the process of what makes a good 3D model, how to find it, and how to get it ready to print. We will be using Thingiverse.com <<https://www.thingiverse.com/>> to find models and PrusaSlicer <<https://www.prusa3d.com/prusaslicer/>> to prepare them for printing. Both are free to use and easy to get started using now!

Customize 3D Models: Join us in the Makerspace we learn how to experiment with 3D models using tinkercad.com. We will cover how to find and import 3D models into this interactive webpage and transform them into custom projects to meet your needs.

Equipment Autopsy: Xbox 360: Tired of expensive equipment breaking and then having to just throw it away? Curious about what makes technology tick? Join the Makerspace crew in attempting to repair an Xbox 360 that has mysteriously stopped working. We will demonstrate how to do some research on the product to see if the fix is as easy as replacing a cord. Then we will pop this modern marvel of engineering open and check out the insides. Can't make the event? No problem! We will plan on leaving the top off and the guts hanging around until after Thanksgiving break for public viewing.

Keychain Lights: Experiment in blending 3D printing technology with electronics in this introductory workshop. Makerspace experts, Dan and Brad, will work with you to create a keychain light of your very own. The project will use simple LEDs powered by CR2032/2016 batteries. It is aimed at beginners in both 3D printing and electronics, but open to all UWEC students, faculty, and staff interested in learning. The cost of the workshop will be \$1 or less, depending on which size battery you choose.

Basics of Arduino and Electronics: Take the first step on a journey to building your own electronics/robotics projects. In this workshop, you'll learn what an Arduino is and how you can use it to control LEDs, buttons, and knobs. You'll also learn the basics of how to program the Arduino. After this workshop, you'll be able to search for projects on the internet and understand

what it will take to complete them. No electronics/Arduino/programming experience is necessary for this workshop. If you do have your own Arduino kit or laptop, please bring them with you.

Basics of 3D Modeling: In this workshop, you'll learn what's involved in designing 3D models. We'll investigate using Blender to do 3D sculpting, using Fusion 360 to do 3D Cad design, and what to do with your finished files, including 3D printing and posting to Facebook. Bring your laptop if you'd like to follow along. No design or 3D printing experience is necessary for this workshop.

Build a Calculator with Arduino: Use an Arduino Uno board to assemble and program a calculator. Think of the Arduino like Legos, once you know how to assemble it, you can take it apart and make other things. If you have your own Arduino kit, bring it. Otherwise we have limited Arduino kits to checkout or buy for \$35. Also, if you bring your laptop, we can get the Arduino software set up on it. No electronics or programming experience is necessary for this workshop.

Intermediate Arduino and Electronics: Continue your journey to building your own electronics/robotics projects. In this workshop, you'll learn how to control motors and how to connect complicated devices that use external libraries, such as temperature sensors, LCD screens, and IR remote control. After this workshop, you'll be able to complete most Arduino projects found on the internet. Required knowledge: Breadboarding, reading circuit diagrams, uploading code to an Arduino

3D Modeling with Fusion 360: Design your own 3D objects and then make them real with a 3D printer. In this workshop, you'll learn how to use Fusion 360, a free CAD program, to design simple 3D objects. After this workshop, stop by any time you have 30 minutes free and we can show you how to use the 3D printer to print your new object. No design or 3D printing experience is necessary for this workshop.

Intro to Soldering: Learn how to solder an electronics project. Walk away with a Line following car, a digital clock, or a Tetris/Snakes game (while supplies last). Extra costs: Car:\$10, Clock:\$10, Game:\$20

Acrylic Paint Pouring: Create beautiful art (while upcycling scratched records and unused CDs) with acrylic paint pouring. Registration required.

Basic Quilt Blocks: Learn the basics to help you start your very own quilt. No prior skills required.

Book Page Flowers & Paper Crafts: Learn how to repurpose old books, maps and magazines into beautiful decorative flowers and other exciting paper crafts.

Bullet Journaling 101 Organize your life and manage your time better with Bullet Journaling (also referred to as a dot journal). In this session learn the basic method, how to plan and get started with this highly customizable organizer/planner/journal.

Creative Bullet Journaling Organize your life and manage your time better with Bullet Journaling (also referred to as a dot journal). In this session, learn some easy to follow ways to add some extra pizzazz to your journal (like hand lettering, dividers, doodles, and more!)

Craft Cutting with Silhouette Cameo: Discover how to easily prepare paper and fabric cutout designs

DIY Book Page Flowers: Learn how to repurpose old books and magazines into decorative flowers.

DIY Greeting Cards: Make your own greeting cards for any occasion. Supplies provided, just bring your creativity! (Also: **Mixed Media Greeting Cards:** Create a set of customized mixed media greeting cards for any occasion that make great gifts or can be handed out individually. Supplies provided, just bring your creativity!)

DIY Scrunchies + Headbands: Learn the basic sewing skills needed to make your own custom scrunchies and headbands.

DIY Vinyl Decals: Decorate your laptops, iClickers, water bottles and more with your own vinyl stickers using our Silhouette Cameo die-cutting machine!

Dorm Decorations: Get your dorm room or apartment in the winter/holiday spirit with some handmade decorations.

Giftable Book Crafts: Upcycle old books and magazines into beautiful and giftable crafts.

Heart-Shaped Quilt Blocks: Learn some basic quilting skills while creating a fun and easy fabric heart shaped quilt block.

Hem It Up: Learn basic sewing skills to fix loose seams on your clothes and how to hem pants

Sewing Machine 101 : Learn some basic sewing machine skills to enhance your project (whether for a Halloween costume, or any general sewing projects)

Scrunchie Repair Workshop: Revive your favorite worn-out or broken scrunchies with some easy to learn sewing skills.

DIY Bows + Sustainable Gift Wrapping: Learn how to create your own handmade bows, folded boxes, and paper bags using recycled paper and vintage maps!

Costume Workshop: Join us for an open house style Halloween costume workshop! Bring your costume or ideas. Feel free to use our supplies - including fabric, sewing machines, paint, paper, masks, and more.

Learn to Crochet: Crochet 101: Learn the basics of crochet! We will teach you how to hold a crochet hook, the basic chain stitch, single crochet, and how to fasten off. Participants will leave with a 'swatch' and the skills needed to make projects like dishcloths, hand towels, etc.

Recycled T-Shirt Headbands + Tote Bags: Create a 5-strand braided headband or tote bag using recycled t-shirts! Shirts available for use, or feel free to bring your own.

Sustainable Costuming: Bring in last year's costume or some other materials and learn how to make it into something new.

Textbook Covers: Protect your new textbooks with covers made from fancy paper, vintage maps, or the traditional brown paper grocery bags!

3D Paper Snowflakes: Come relax and make beautiful swirling paper snowflakes. Use scrap paper, recycled book pages, or maps to make these fun winter decorations.

Book Purse / Pencil Case: Turn an old book into a new pencil case or clutch bag. Sew a fabric lining and learn how to incorporate a nifty magnetic clasp into your stylish, bookish accessory. All materials provided, but feel free to upcycle a book of your own if you prefer.

T-shirt Tote Bags: Recycle a T-shirt to make a fun, environmentally friendly tote bag. Bring your own T-shirt or upcycle one of ours!

DIY Reusable Lunch Bag: Come to the makerspace and learn how to sew your own reusable lunch bag! These lunch bags are easy to clean and simple to make, no sewing experience required.

Paper Marbling: Learn how to create your own marbled paper. Try your hand at marbling and create a beautiful sheet of your own design to use as stunning stationary or brilliant bookmarks. All materials provided. Rain site for Wed 5/15: Lower level of McIntyre Library