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Milner Library Makerspace Working Group Final Report

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Introduction

The Makerspace Working Group was created in 2016 with the following charge:

To investigate the development of a makerspace in Milner Library’s uLab space. Specifically, the project team will explore the professional literature, perform a needs assessment, gather feedback from campus and external users and identify potential campus and off-campus partners to define what should be included in the makerspace. The team will produce a schedule for development of the makerspace, ascertain short- and long-term expenses, identify potential staffing and corresponding professional development and training needs, and develop an assessment plan for makerspace usage.

Interest in a potential makerspace grew out of discussions by former Milner Library Dean Dr. Dane Ward with a number of other college deans who approached him about the development of such a campus space in Milner Library. In addition, the library was re-considering the use of the uLab computer lab space which has experienced a precipitous drop in usage—over 88% in the last sixteen years. Since Milner Library was beginning to consider a comprehensive space planning process, the results of the working group will inform that process in FY18. Lastly, campus currently does not provide a centralized developmental support center for students’ use of technology for classroom and extracurricular projects. Typical IT help desk technical support (e.g. configuring email, installing MS Office, removing malware, replacing a broken screen) is provided by the Technology Support Center and TechZone. Their scope does not include instruction on how to use or apply software or specialized equipment.

The working group utilized a design thinking process that stresses iterative and participatory planning. Following this method, the working group developed proposed solutions only after completing a discovery phase that involved considerable information gathering.

To prepare for the discovery phase, the working group:

1) consulted the professional literature and visited web sites of over sixty similar learning spaces in academic settings
2) developed areas of focus: fabricating technologies (e.g. band saws, drills), specialized software (e.g. GIS), specialty technologies (e.g. 3D printer, One Button Studio)
3) developed interview questions and processes for a card sorting exercise, interviews, and focus groups
4) submitted an Institutional Review Board protocol
5) clarified that feedback should inform two stages: renovation of the current uLab space and identification of long-term recommendations for the library’s planned space planning process
6) identified possible interviewees, site visit locations, and focus groups

During the discovery phase, the working group held sixteen interviews with nearly thirty campus and off-campus stakeholders and subject matter experts; went on thirteen site visits to makerspaces and similar learning spaces in the Bloomington-Normal, Champaign-Urbana, and Chicago areas; and led six focus groups—two each with undergraduates, graduates, and faculty and staff—attended by approximately fifty participants in April 2017.

A review of the accumulated feedback and information gathered in the interviews, site visits, and focus groups led to insights that could be categorized into two broad groups: help/support/programming and technology/resources/space.

Help/Support/Programming

- The need for certification or training for the space was mentioned in numerous settings, especially in relationship to ensuring the safety of the users and proper handling of specialty equipment. This was particularly true for use of spaces that would include fabricating and audio/video technologies.
- There was little consensus about hours of service—responses varied in and between the different feedback constituencies. The lack of expressed need for weekday mornings was about the only consistent finding. Hours would be needed on weekdays and weekends, including evenings.
There is a desire for qualified staffing with some full-time personnel. There was not widespread agreement on the status of the position (e.g. library staff, educational technologist, instructional designer) or the type (e.g. drop-in service, scheduled consultations, workshops or other programming).

There was great interest in Milner’s space collaborating with current or proposed similar spaces on campus, such as Studio Teach and the College of Business 3D printing lab. Milner’s space was seen as providing complementary access to some other campus offerings while also being able to provide some supplementary services and tools in a building with the most generous hours on campus.

There was a considerable call for providing scheduling of potential spaces (e.g. One Button Studio) in the Milner space. Some users would like the ability to schedule online.

In discussions about programming and services, more respondents asked for offerings related to specific skills (e.g. using Photoshop to save family photos) or use of technologies or tools rather than general experimentation. The latter would definitely still be welcomed.

Fear of failure and waste of materials was noted as being a characteristic of student users. Any budgets and/or charging models would need to take this into account.

Milner will have to take a clear and direct lead in identifying and providing examples of potential uses for both students and faculty. Students and faculty/staff responded that they would need to see something first - whether it’s how the technology works, how to teach/incorporate it into the class, or how to use it for specific projects and/or assignments.

Promotion and knowledge of the space, resources, technology, help, support, and programming will be vital, especially as many participants stated that they did not currently know about many things the library currently offers. One Undergraduate focus group agreed about the usefulness of the bathroom newsletters.

Technology/Resources/Space

There was a general call for the space to be flexible, relaxed, inviting, and safe. There would need to be methods to store in-process projects and archive or save finished projects. There was also frequent mention of the need for meeting spaces in this location, as well as the ability to offering conferencing or interviewing capabilities. Presentation support was not just seen as offering tools and space, but also for development of skills.

There was interest in fabricating technologies, such as drills, saws, soldering tools, but acknowledgement that the current targeted uLab space, even after renovations, would likely not be suitable given a variety of environmental (e.g. venting), practical (e.g. insufficient space, noise), and other reasons. There was also acknowledgment of a campus effort to develop a STEM makerspace focused on experiential learning, creativity, collaboration, and innovation and Milner believes such a space is more appropriate place for fabrication technologies. Arts and craft technologies, such as sewing machines, were seen as possibilities in the current renovated Milner space.

3D printing was among the most mentioned items and often generally assumed this service would be offered in the Milner space.

Gaming and augmented or virtual reality were specifically mentioned as supporting current curricular needs, but were among the items that patrons least expected to be available in an academic library setting. There is not currently a focused campus effort with these technologies, so they would provide a real opportunity for Milner to take the lead.

Equipment that would support pre-service teacher students, such as laminators, large format printers, vinyl cutters, etc., would be quite welcomed.

Audio and video recording spaces were among the most heavily utilized services offered in the site visit locations. They also elicited a considerable amount of interest from interviews and focus groups. These were seen as two separate entities—One Button Studios and fully-developed audio and/or video studios with soundproofing, software, equipment, and support. The former is designed to be relatively plug-and-play while the latter would require considerable financial and personnel investment in development and support.
Data visualization was mentioned frequently especially in response to questions about digital wall technologies. Given Milner’s current interactive video screen location (third floor, east wall), prior “digital wall” offerings, and close collaboration with Arts Technology, consideration should be given to integrating it into a future Milner space.

Building and expanding on the external feedback, the Working Group identified additional challenges:

- Milner Library does not have a central role in curriculum development which may make linking the space to existing and future curriculum challenging.
- A number of spaces already exist on campus that offer a subset of the services and equipment Milner Library intends to offer in this space. It will be essential that the Milner Library space extends and enhances the existing spaces through collaboration with campus partners, rather than competing with them.
- Milner Library must be willing to extend beyond its traditional offerings for both how the space is used and technology/equipment is made available to patrons.
- Recruiting and keeping qualified staff, both full-time and student workers, could prove challenging due to the diversity and demands of the services, technology, and equipment.
- Given the lack of campus models to emulate and the uncertainty of continued costs for staffing, new and refreshed equipment, materials, and maintenance, sustainability of the space will be challenging.
- Sustainability and long-term budget forecasting are a challenge given the unpredictability of the State of Illinois budget and its impact on Illinois State University budgets year-to-year.

Proposals and Recommendations

Core Concept

Milner Library is developing a space that will offer a flexible, relaxed, inviting, and safe place for students in support of their personal and curriculum-based projects by providing them access to specialized technology and assistance with using that technology. The space also supports and enables faculty projects and classroom assignments. The space will be staffed by qualified, full-time personnel who are familiar with the software and equipment available in the space and are knowledgeable in tying these technologies to the differing curricular and other needs of campus partners. The space is meant to push the envelope of technological and space offerings on campus beyond the traditional computer lab by encouraging experimentation and learning-by-doing.

In the process of gathering feedback, the focus of the working group has transitioned from a Makerspace to a new technology space more akin to a digital media lab.

Programming/Services

Based on feedback, there was strong interest in the space and staff supporting development of specific skills—such as using certain technologies or tools—and offering a variety of types of instruction, including drop-in service, scheduled consultations, workshops, and other programming. General experimentation would definitely be welcomed but may not be a primary focus of programming or instruction.

Proposed Initial Development – Renovation of uLab

The initial stage of development would involve the conversion of a portion of the current uLab space—on the east side of Milner Library’s second floor—into a new technology space.

Proposed technology/tools (covered in greater detail in one-page profiles at end of document)

- 3D Printing Room
• Digital Media Stations
• One Button Studio
• Pre-Service Teacher Equipment
• Soundproof Booth

Space needs

• Storage lockers – to store patrons’ unfinished projects

A Gaming Space was also considered for the Initial Development given piloting of a gaming room for specific English courses in recent years. However, there was not enough positive feedback given in the focus groups, interviews, and site visits to pursue it as this point. However, if the decision was made to pursue this addition to the space, there are many exemplars in libraries to inform the process. Lastly, a gaming space would not require extensive changes to the uLab space, so it could be more easily accommodated than space, technology, and tools noted in the Future Development phase.

Expansion of the loanable technologies was discussed as being in the space, but given uLab space constraints, the working group decided to suggest expansion of available technologies (e.g. multimedia equipment and coding/maker kits) but for circulating technologies to remain in Access Services.

Future Development – New space/expansion

Future development, in the form of a custom-built space or expansion of Milner, would almost assuredly require external funding. This section is seen as informing the FY18 Milner Library space planning process.

Technology/Tools

• Larger, dedicated Audio/video studio spaces
• Fabricating technologies that aren’t in the proposed campus Makerspace
• Digital visualization walls
• Virtual Reality Room

Space needs

• Meeting spaces
• Conferencing/Interviewing space
• Presentation space
• Technology support space – especially if TechZone support services moved to Milner

Scheduling

The space would need to incorporate scheduling options, such as mediated use of current scheduling options like Outlook, or investigate additional software that would allow for both mediated and unmediated scheduling. During interviews and site visits both on- and off-campus, various scheduling options were discussed and seen. If pursued, scheduling software should be capable of being adapted for use in other library areas (e.g. group study rooms).

Staffing
As seen in the aforementioned feedback, one of the most consistent responses was the need for a full-time staff person to lead and manage the new space. Administratively, this position could report to the Information Use & Fluency or Library Information Technology Services departments. Given the instructional and technical demands of this space, there would need to be coordination between these two departments, regardless of where the full-time staff person reports. The space would also likely see at least partial reassignment of duties by existing LITS staff. Full-time staffing would potentially benefit from alternative scheduling that begins in later morning or early afternoon and extends into the evening.

Graduate assistants would be another good option for this type of space by providing higher quality service than can often be provided by typical student workers. G.A.s could potentially assist with evening staffing.

There would need to be additional student worker funding for this area. Currently, the space is single staffed by students annually for roughly 4,500 hours at a cost of approximately $37,500. Funding for uLab student workers currently comes from Milner’s share of Tech Tuition dollars. The students essentially act as room monitors and are not required to have specialized skills. Given the need to attract students with specialized skills, we suggest an increase in the starting wage.

Depending on the staffing model of the full-time staff and potentially graduate assistants, there may also need to be an addition of a second student worker during evening hours. If there is enough demand, there could also be consideration to restoring the midnight to 3:00 am shift that was eliminated with the recent budget cuts; this likely would be student worker staff.

**Budget/Sustainability**

The budget for the Initial Development would come primarily from Milner and funding requests to the Provost Office and Administrative Technologies. Future Development would be a possibility for advancement opportunities.

There would need to be a commitment to the purchase of new technology and tools and sustained refresh budgets. This could be done through the use of Milner Library’s Marie Jessa Fund.

**Professional Development**

Professional development sessions would be offered both internally to Milner personnel and to campus faculty, staff, and students. Internal professional development training would work best through a collaboration between the new space staff and the Information Use and Fluency department.

Sesssions for campus personnel could be coordinated with the Center for Teaching, Learning, and Technology. Feedback suggested offering both drop-in sessions as well as the availability of drop-in and scheduled consultations.

To attract faculty to incorporate the technology, tools, and services of the new teaching space, Milner could consider funding a faculty fellows program with course buy-outs or a summer program that allows for course re-design, similar to CTLT’s DART Online or the Center for Community Engagement and Service Learning’s American Democracy Project grants that encourage integration of civic engagement and serving learning into students’ curricular experiences.

**Assessment**

Given that this type of space is new to the library and largely to campus and a commitment to trying new technology, services, and tools in the space in coming years, there needs to be a clear assessment plan. The plan would consist of usage tracking, such as number of logins, tracking of service interactions, amount of materials utilized, etc.

Regularly scheduled follow-up feedback sessions and environmental scans would ensure the space continues to meet campus needs. The library could hold meetings with college curriculum committees to gauge impact on curriculum.
A campus advisory board should be considered. It would consist of campus partners, faculty and staff partners, and representatives from student organizations that have a natural affinity with the space, such as the Arts Technology Program.

**Conclusion**

Despite the name of the working group, this report does not envision the new space as being a “makerspace.” With the development of this new space, Milner Library has an opportunity to be both a campus leader and partner. It will require an initial and ongoing commitment of fiscal and personnel resources.

Patrons, especially students, would benefit because there is not currently a space on campus that is available to everyone with the services, technology, and tools that have been proposed.

Milner Library and other campus units should consider utilizing design thinking process for future planning. The working group consistently received positive feedback from interviewees, focus group participants, and site visit personnel who expressed interest in the process and often remarked they would benefit from similar efforts.

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**Working Group members**

Nancy Boulware  
Lauren Carroll  
Chad Kahl, chair  
Julie Murphy  
Jason Paul  
Anne Shelley  
Paul Unsbee  
Chris Worland

*Sally Gibson and Rick Satchwell also initially participated as working group members.*
Space/Technology/Tool Profile1: 3D Printing  

Description

3D printing is an additive manufacturing technique that creates three dimensional objects from a digital file.

What needs or opportunities does the technology/tool address?

- Milner would join academic and public libraries nationwide who have incorporated 3D printing into their services.
- Milner could offer an easily accessible space on campus that will allow students, faculty, and staff to 3D print. Currently, there are 3D printing options on campus but locations often have limited access, available resources, etc.
- Potential users could include students, faculty, and staff from nearly every college, department, program, or unit on campus for both academic need and personal interests.
- 3D printing was widely assumed as being added to Milner’s new space based on feedback from focus groups, interviews, and site visits.
- Most site visit spaces offered 3D printing.
- There was professed interest from focus group attendees, interviewees, and site visits hosts in the development of a campus network of units that offer 3D printing to better share best practices, information, and offering details.

Who does the technology/tool involve, both in building and in using it?

- Milner would need to decide on appropriate 3D printer(s) that offer ease of use, support expected needs, have community support for users, and are covered by appropriate warranties. During site visits, working group members were advised to have at least two 3D printers, so one would be available if the other was unavailable (which was common). Filament for 3D printers vary in cost, color, and appropriate usage.
- 3D printers are noisy, so an enclosed space would likely be needed.
- Site visit spaces typically offered mediated services where users submitted designs for printing.
- Some institutions charged for printing by shape, size and/or weight and others offered free printing.
- There is also a sizable professional library community and literature for guidance.

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1 Space/Technology/Tool Profile components adapted from phase 3-2, Refine Ideas from Design Thinking for Educators, © 2012 IDEO LLC. All rights reserved.
2 Pictures taken at site visits to the University of Illinois at Urbana Champaign’s College of Business’ Illinois MakerLab and Northwestern University’s The Garage
Space/Technology/Tool Profile: Digital Media Station

Description
High-performance desktop computers and monitors with audio, video, and image editing software at work areas that allow for collaborative work.

What needs or opportunities does the technology/tool address?
• Milner Library currently offers two digital media workstations with novice- (e.g. iMovie, GarageBand) and advanced-level audio and video software (Final Cut Pro X, Logic Pro X, Adobe Creative Suite). Existing machines will either need to be moved or replaced.
• Existing digital media workstations are not located in areas with staff expertise. Assistance is by appointment.
• Potential users could include students, faculty, and staff from nearly every college, department, program, or unit on campus for both academic need and personal interests.
• Working group members heard considerable interest from campus stakeholders about this potential offering, especially since student needs are not currently being met in a general campus setting.

Who does the technology/tool involve, both in building and in using it?
• A full-time staff person, well-versed in the equipment and software, will meet a campus need. Student workers will need to be hired—and likely better compensated—with higher skills sets than Milner currently demands of its uLab staffing.
• Incorporation of loanable media equipment at the Access Services desk, One Button Studio, and soundproof booth will likely be coordinated with these offerings.
• Milner Library needs to make a refresh commitment to ongoing expenses related to technology upgrades and software licenses (that have moved primarily to a pricier annual license model).
• There are also sizable professional information technology and library communities and literature for guidance.
Technology/Tool Profile: One Button Studio

Description
Penn State University describes the One Button Studio as “a simplified video recording setup that can be used without any previous video production experience. The design of the studio allows [one] to create high-quality and polished video projects without have to know anything about lights and cameras. You only need to bring your flash drive with you and push a single button.”

What needs or opportunities does the technology/tool address?
• Milner would join academic libraries nationwide who have incorporated One Button Studios into their services.
• Illinois State University does not currently have an easy-to-use video production option for general use.
• Potential users include students who want to film themselves giving presentations or conducting mock interviews, or who have to create videos for class assignments.
• Working group members heard considerable interest from campus stakeholders about this potential offering.
• Feedback from site visits noted that the One Button Studios were frequently utilized by students, faculty, and staff.

Who does the technology/tool involve, both in building and in using it?
• Penn State University’s One Button Studio site has setup and equipment guides for easy reference, including a detailed spreadsheet of needed equipment (e.g. computer and monitor, camera, lighting, microphone, presentation monitor), prices, and links to suggested purchases. The July 2017 cost estimate was roughly $10,000. Milner Library would also work with the Learning Spaces & Audio/Visual Technologies campus unit to develop and outfit the room.
• Milner would also experience facilities costs since there it not currently an enclosed, soundproof space in the uLab.
• Site Visit feedback noted need for room scheduling; frequent troubleshooting that was typically done by student workers; and periodic technology maintenance by campus or unit information technology departments.
• A reservation system would need to be developed.

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3 Pictures taken at site visit to Northwestern University’s One Button Studio in the library’s 1South location
4 One Button Studio information – http://onebutton.psu.edu
Space/Technology/Tool Profile: Pre-Service Teacher Equipment

Description
Space and equipment that support needs for pre-service teachers.

What needs or opportunities does the technology/tool address?
- This equipment was formerly available from the College of Education in DeGarmo Hall and then supported by the Student Government Association in the Student Services Building.
- This type of equipment and support is available in curriculum centers at academic libraries to support pre-service teachers.
- Specific requests for this type of space were sent to the working group.

Who does the technology/tool involve, both in building and in using it?
- Space would contain a laminator, large format printer, Ellison die cuts, button maker, spiral binding machine, and vinyl cutter.
- Availability of a SMART Board was specifically mentioned by attendees to the undergraduate focus groups.
Technology/Tool Profile: Sound Booth

Description
Sound booth allow for use of digital media station and audiovisual equipment in a sound-dampening space.

What needs or opportunities does the technology/tool address?

- Milner currently has a sound booth on the sixth floor of the library that currently contains a digital media station, but it’s large enough to hold additional equipment, technologies, etc.
- The existing sound booth is currently separate from much of the other multimedia offerings. A sound booth in the renovated uLab space could be incorporated into existing and proposed multimedia services and support.
- Potential users include any students, faculty, and staff that have audiovisual recording needs, especially various departments in the College of Fine Arts, the College of Arts and Sciences, etc.
- Sound booths are found in both academic and public library settings, including a number of the site visit locations.

Who does the technology/tool involve, both in building and in using it?

- Milner should consult with the Learning Spaces & Audio/Visual Technologies, College of Fine Arts, the Eckelmann-Taylor Speech and Hearing Clinic, School of Communication, and other relevant campus units that may be able to provide professional guidance on appropriate options, potential uses, etc.
- Careful consideration will need to be given if purchasing a newer sound booth is more economical than moving the existing one, especially since the manufacturer is no longer in business.
- The sound booth is roughly 7’ x 5.5’ x 8’ with an additional six inches of ventilation fans on top. The interior is roughly 6’ x 5’ x 7.5’. Weight is unknown.
- A reservation system would need to be developed.