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Refocusing mobile makerspace outreach efforts internally as professional development

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Abstract

Purpose – The purpose of this paper is to uninitiate new and non-traditional library resources, such as those commonly found in a makerspace, can often seem abstract, intimidating, or even unrelated to the library mission. The University of Nevada's DeLaMare Science and Engineering Library set out to engage its on-campus library colleagues to increase awareness and understanding of the new technologies being offered in support of active learning and discovery.

Design/methodology/approach – The science and engineering library is experimenting with an ongoing series of inreach/outreach workshops that enable other library faculty and staff from across the greater library organization to experience their non-traditional services and resources. A first pop-up maker technology workshop took place in June 2015 and was composed of three sessions including an introduction to 3D printing and modeling, digital design literacies, and lendable technologies. A survey was distributed to attendees for feedback.

Findings – Anecdotal evidence suggest the event was successful, offering a potentially powerful mechanism for engaging and informing library staff about non-traditional resources and technology.

Originality/value – This outreach approach may prove valuable for other academic libraries to similarly create awareness of non-traditional resources and technologies among its colleagues.

Keywords Academic libraries, Emerging technologies, Active learning, Makerspace, Knowledge creation, Staff development

Paper type Case study

Introduction and background

The University of Nevada, Reno (UNR) was established in 1874 as the state's land grant institution and is Carnegie ranked as a high research, comprehensive doctoral university (The Carnegie Classification of Institutions of Higher Education, 2015) The Mathewson-IGT Knowledge Center (MIKC) is the main library on campus and provides primary support to the student body of approximately 20,000 students. The DeLaMare (DLM) Science and Engineering Library is a small branch library on the campus of the UNR. Over the past five years, DLM has acquired and provided access to a variety of non-traditional maker resources and services including 3D printing and scanning, laser and vinyl cutting, a large collection of lendable technology with programmable electronics, virtual reality goggles, and more.

In support of its outreach mission, DLM faculty and staff regularly take this maker technology on the road engaging with both the University and greater Reno communities at a variety of events. These outreach and engagement efforts have repeatedly proven to be successful, prompting the consideration of their possible use as part of internal professional development and outreach. To the uninitiated, such new and non-traditional library services can often seem abstract, intimidating, or even unrelated to the library mission. The authors set out to engage their on-campus library peers by means of mobile makerspace inreach efforts to increase awareness and understanding of the new technologies being offered in support of active learning and discovery.



Literature review

The buzz around makerspaces in the library community continues to grow as more libraries of all kinds continue to create spaces that foster making and active learning. While some question whether or not makerspaces belong in academic libraries (Farkas, 2013), many agree that “The library is in a unique position to be able to leverage the wealth of learning and opportunities for knowledge creation that access to such technology can provide in a way that most individual departments are not” (Kurt and Colegrove, 2012). Often seen as the heart of the university, academic libraries are already destinations where students, faculty, and staff can utilize shared resources, collaborate with each other or study individually in a variety of spaces, and create knowledge. Its central position in academia means any new service or resource, including a makerspace, provided by the academic library will have a larger impact on the university as a whole, reaching already existing patrons and utilizing its vast outreach network to attract new ones, than any other academic department on campus.

Makerspace values closely align with academic libraries’ missions and goals. A recent survey of academic libraries with makerspaces concluded that, “The democratization of technology, the maintenance of the library’s perception as a leader in technology innovation, and continued support of scholarship are the most cited reasons for including a makerspace in an academic library” (Rich, 2014). Through makerspaces, academic libraries are able to not only be seen as innovative leaders on campus, but can also expand the ways they support scholarship, especially across the STEAM disciplines. Beyond monograph and journal access, explicitly including support for active knowledge creation via physical means such as 3D printing and other “maker” technologies.

The belief in the democratization of information is also a core value of all of libraries. They provide access to a wealth of information, resources, and technology to anyone who walks into our doors. In rural areas where the distance to a library is great, librarians have long offered bookmobile services which travel to remote areas to provide access to information. Libraries are now providing access to physical making technology through similar mobile means. In Fryslân, Netherlands, a mobile fab lab, similar to a bookmobile, called Frysklab was started by the city’s public library to bring maker curriculum and tools to young learners in rural areas (De Boer, 2015). MakerMobile of Vancouver, BC has outfitted a traveling classroom with work benches, tools, and computers (MakerMobile, 2015). STE(A)M Truck in Atlanta, GA resembles a food truck and trailer whose goal is to bring maker tools, including 3D printers, electronics, and hand tools, to local area schools (Community Guilds, 2013). Mobile makerspaces can also imply other innovative ways to provide access to resources. Lacking the physical space to house large maker equipment, the Idaho Public Library system now provides various types of “Make It, Take It” kits which patrons can check out and use to make a plethora of DIY projects outside the library (Idaho Commission for Libraries, 2015). The Arrowhead Library system is addressing the lack of physical space in some of their branches by creating a mobile makerspace in which equipment travels between the various branch libraries for making activities and programming (Damon-Moore, 2015).

Professional development is a broad term that encompasses all types of continuing education opportunities for library staff and faculty. Academic libraries change over time in response to the constant flux of higher education and through professional development librarians can participate in continuous engagement with their colleagues

and stay abreast of current trends in the field. Continuing education and professional development involves becoming increasingly engaged with the field and can take on many looks including attending conferences, further coursework, viewing webinars, and so on. The benefits of these programs include improved workplace communication and customer service and it stimulates creative energy in library faculty and staff (Jennerich, 2006). As Guo states, “With technology changing faster than ever, it is easy to be left behind. A major challenge that library employees always face is keeping up with the ever expanding number of technologies available for use in libraries” (Guo, 2014). We first saw the library community utilize internal professional development to address this challenge by utilizing the Learning 2.0 (or “23 Things”) program originally developed at the Public Library of Charlotte Mecklenburg County (Blowers, 2006). As libraries across the world adopted this program which emphasizes play, experimentation, and social interaction as a means of learning, there were reports of astounding change among librarians’ attitudes toward emerging technologies. Titango and Mason (2009) concluded that the program “[...] fundamentally changed the staff’s way of thinking and working”. While studying the impact of the program at the Yarra Plenty Library in Victoria, Australia, Lewis noted that “Library staff are capable of learning new technologies, and that it is OK to learn through exploring and playing with web applications rather than having to wait for more formal structured training to be scheduled” (Lewis, 2008). We found the success of the Learning 2.0 program to be encouraging and informative as we sought out ways to encourage understanding of new maker technologies through play and experimentation with our own colleagues.

Methods

DLM librarians hosted a pop-up maker technology outreach event as an internal professional development opportunity – a demonstration of what resources and services the libraries are currently offering and how they are contributing in supporting the teaching, learning, and discovery missions of the University. It had been noted casually by some MIKC librarians that they were unaware of what new technologies were being offered in DLM and would like there to be more communication between the libraries on services and resources available in each location. Upon examination of potential causes for lack of communication and awareness of services and resources, it was realized that library staff across the organization may not have regular opportunities to be a part, or even notified, of what is happening in a branch library. Whether within a single large building or across geographically diverse locations it can be challenging to effectively communicate availability of services and resources throughout the greater organization. In the hope of closing that gap, DLM librarians took advantage of a break in the academic calendar in June 2015 to close the physical gap between UNR library spaces and host a “Maker Learning” event for all staff housed in the main library building on campus. New and non-traditional library resources, such as those commonly found in a makerspace, can seem abstract, intimidating, or even unrelated to the library mission. DLM staff looked at this as a chance to exhibit the skills and literacies provided by those resources and their benefits to students, faculty, and staff in science and engineering departments on campus (Plate 1) as well as an opportunity to build stronger working relationships with MIKC staff (Plates 2 and 3).

A concerted effort was made to showcase a representative sample of high-use technologies which lent themselves to a pop-up workshop. Separate sessions were devoted to technologies which may present perceived high barriers to learning



Plate 1.
DLM staff and
students
participating
in science and
technology-related
outreach events in
the Reno, NV
community and
in Washington, DC

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Plate 2.

A participant utilizing the Oculus Rift virtual reality headset to engage at the lendable technology session



Plate 3.

MIKC Staff at the lendable technology session



for the uninitiated. These included 3D printing and modeling, digital design literacies, and a wide range of lendable technologies. A DLM librarian served as the instructor for each session. Student employees from the library provided additional support for each session – showcasing literacies students had acquired while working with these various types of resources provisioned through the libraries. To be inclusive and increase publicity, the session was advertised through an assistant dean who forwarded event announcements via e-mail to all library and IT staff (see Figure 1). Attendees gathered in a public workspace and then dispersed to the three sessions. The sessions were offered in parallel with opportunities for participants to shift between sessions at half hour intervals. At the end of each session, attendees were given the opportunity to fill out an evaluation asking what they liked about the session and what improvements could

Curious about the tech and activities in DeLaMare? DLM staff are hosting three mini workshops as part of a professional development activity:

- Hands-on with a variety of lendable technologies, from Google Glass and the Oculus Rift virtual reality headset to robotics toolkits and soldering irons: Tech Services lunch/open area
- Introduction to 3D modeling and printing; design something online that could then be printed: Instructional Design lab (room 414)
- Digital/design literacies: take an image from photograph to vinyl cut sticker! @One Dataworks Lab (room 121)

Meet first in the tech services conference room (416). Groups will split up from there.

Put it on your calendar:
 Thursday, June 4, 10:00 a.m. – 12:00 noon.
 Knowledge Center, technical services conference room, 416
 Open to all library faculty and staff.


 | Assistant Dean of Libraries
 | University of Nevada, Reno | w. Mathewson-IGT Knowledge Center

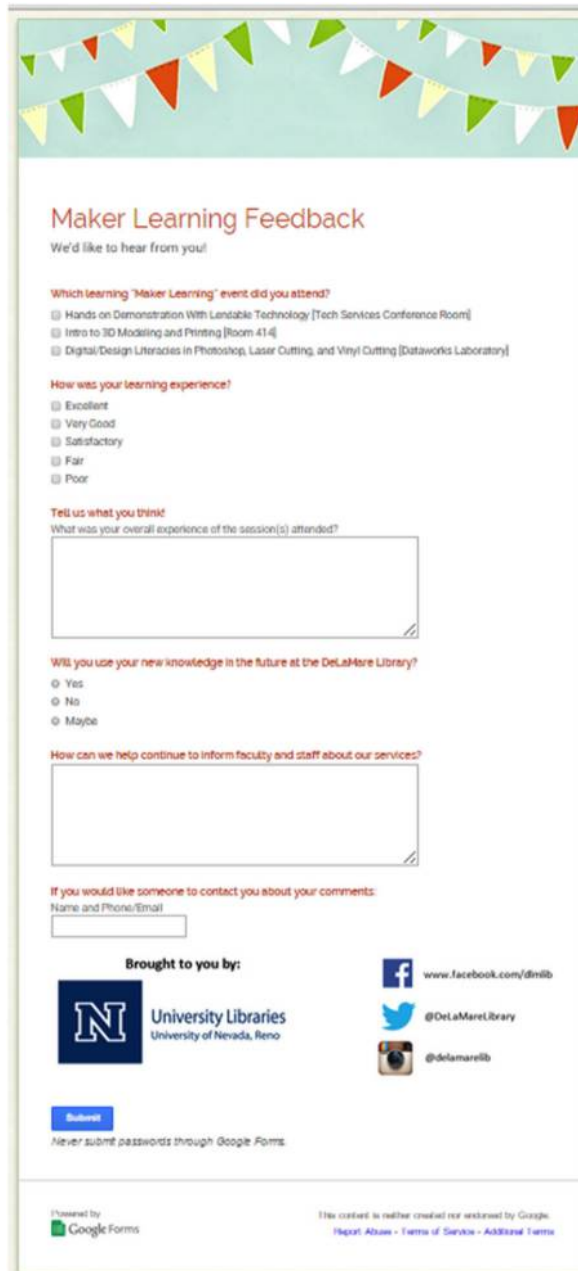
Figure 1.
 E-mail
 announcement sent
 by Assistant Dean,
 inviting all Library
 and IT staff
 to attend the
 Maker Learning
 professional
 development event

be made. An online version of the evaluation was e-mailed to participants following the event to gather more responses (Figure 2).

Particulars associated with each of the three sessions were as follows.

Hands-on with lendable technologies

The lendable technology session exposed attendees to items available for checkout through the library. Items included examples of all those publicly available for checkout and are as follows. Google Glass demo units (Google Glass, n.d.) are wearable technology that resemble a pair of glasses with a small eyepiece in the upper right which responds to natural language voice commands and touch controls. Oculus Rift virtual reality headsets (Oculus VR, 2015) are head mounted displays which provide an immersive experience for users. The ability to develop new games and functionality accompanies this headset. SparkFun Arduino Inventor Kits (Sparkfun Electronics, 2015) are programmable circuit boards used for creating electronic projects. Users can write programs and upload them to the physical board. Makey Makey Invention Kits (JoyLabz, 2015) are small circuit boards used to introduce users, usually children, to electrical circuits and programming. littleBits DIY electronics (littleBits, 2015) are do-it-yourself electronic elements that snap together to create a functioning circuit with no programming needed. Artec 3D scanners (Artec, n.d.) which capture light off reflected surfaces and create detailed 3D models. Raspberry Pi microcontrollers (Raspberry Pi, n.d.) are small, programmable CPUs meant to be affordable solutions to supplement teaching computer programming in a fun way. Lastly, a Leap Motion 3D controller (Leap Motion, Inc., 2015) small USB device which uses Infrared cameras and LED lights to observe 3D objects in motion above it. The items were set up around a long table with discussion and demonstrations for each item. The format was open: attendees were then able to play with and experience any of the technologies that interested them. Two DLM librarians led demonstrations and helped users with the technology. When appropriate, devices were connected to laptops with games ready to play so the user got to experience the interactivity each object provided.



Maker Learning Feedback

We'd like to hear from you!

Which learning "Maker Learning" event did you attend?

- Hands on Demonstration With Lendable Technology [Tech Services Conference Room]
- Intro to 3D Modeling and Printing [Room 414]
- Digital/Design Literacies in Photoshop, Laser Cutting, and Vinyl Cutting [Dataworks Laboratory]

How was your learning experience?

- Excellent
- Very Good
- Satisfactory
- Fair
- Poor

Tell us what you think

What was your overall experience of the session(s) attended?

Will you use your new knowledge in the future at the DeLaMare Library?


- Yes
- No
- Maybe

How can we help continue to inform faculty and staff about our services?


If you would like someone to contact you about your comments:


Name and Phone/Email


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Figure 2.
Maker learning
feedback evaluation
form

Introduction to 3D modeling and printing

The introduction to 3D printing and modeling workshop took place in an instructional design lab in the building and focussed on introducing people about our 3D printing services and learning 3D modeling skills. The goal of this session was to

introduce participants to the relative simplicity of the 3D modeling process and demonstrating first hand that 3D modeling literacies can be acquired by everyone and that they provide clear avenues for the manipulation of real-world objects. Attendees created a functional bottle opener using Tinkercad (2015), a free and easy to use online 3D modeling program. Other free 3D modeling programs that are more advanced such as Onshape were considered for demonstration purposes (Onshape, 2014). Participants were led through the modeling process to create a functional bottle opener that could be 3D printed. Users left the session with a 3D object file ready to be printed (Figure 3).

Digital/design literacies

The digital design literacies session took place in a computer lab in the MIKC with access to Adobe Photoshop CS6. This session was meant to introduce attendees to image-processing literacies needed to use DLM's laser cutter and vinyl cutter. A librarian and a student gave a presentation about how to manipulate images for engraving or cutting on DLM's laser or vinyl cutter followed by a hands-on exercise in which attendees took an image of the University logo and processed it in Photoshop. Tasks included resizing the image, posterization, reducing brightness and contrast, and erasing erroneous bits of the image. Instructors brought along real-world examples from DLM of objects that had been cut or engraved by students or faculty and passed: not only to showcase student projects but to kickstart creativity and imagination among session participants (Plates 2 and 3).

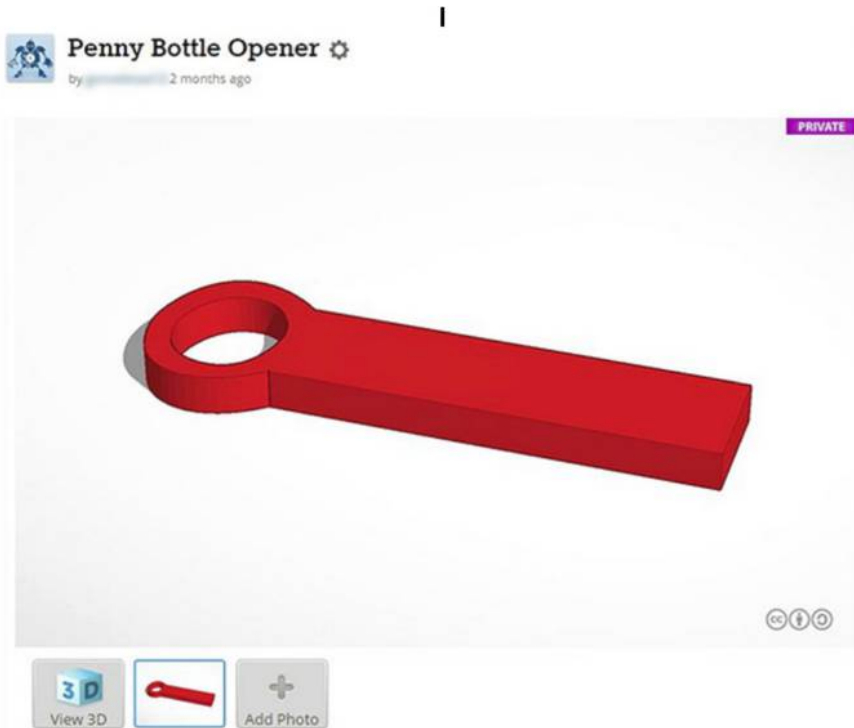


Figure 3.
With the insertion
of a penny into the
bottle opener, the
object is functional

Results and discussion

An estimated 150 faculty and staff housed in the main library on campus, the MIKC, were invited. Of those, approximately 40 (27 percent) attended the event from a wide variety of departments that included library services, technical services, reference services, and administration. Of those who attended at least one session, 16 (40 percent) filled out surveys with responses. No identifying information was gathered to ensure respondents remained anonymous. The survey responses were overall positive with some suggestions about how the sessions could be improved. Of the respondents, all 16 (100 percent) rated their learning experience “Very Good” or “Excellent.” In an additional comments field, respondents gave more positive feedback. Comments included: “Another maker event!” “Offer this type of event again in the future.” And “Have additional training sessions for library staff.” When asked to “Tell us what you think,” results revealed more information. Comments seem to suggest participants think sessions increased their awareness of non-traditional resources and now better understand their utility in learning and knowledge creation:

It was especially useful to see some of the resources and services that are being offered at DLM in order to inform students and faculty about what is available to them there. I don't anticipate being able to use any of the skills or tools myself, but I thought the demos were very interesting and fun.

Loved the 3D workshop and the Lendable Tech table the best. Wish we had more time to work with the 3D program. Everyone in my group really enjoy the sessions [sic].

I hope to see this type of event become an annual show at minimum. Thank you all for putting it on. Great Job!

DLM shows how active learning can come in different forms. Allowing users to tinker and experiment further engages them in the learning process:

[...] Also enjoyed the lendable technology because it demonstrates how learning can come from play and creative experimentation.

Other comments seem to suggest that being mobile and bridging the physical gap facilitated opportunities to engage with the resources that participants had not had before:

I really enjoyed the sessions. I don't spend much, if any, time in DeLaMare, so it was good to spend some time with the staff and technology there.

Attendees outreach supports desires to go deeper and understand more about the technology:

Loved it! A wonderful way for us at the [MI]KC to become familiar with the great work you do at DLM!

Suggestions implied a desire for extended opportunities and more in depth workshops in the future:

[...] Wish we had more time to work with the 3D program.

I'd like to go from design to product in hand.

Conclusions

Preliminary indications suggest this approach – namely, refocussing mobile makerspace outreach efforts internally as professional development – may be

beneficial in addressing the many concerns raised by incorporating non-traditional makerspace services and technology into the academic library setting. As academic libraries have moved toward supporting new methods of knowledge creation along with accompanying resources, staff must remain current with trends and technologies provided today through professional development opportunities (Somerville *et al.*, 2005). The resources provided by the DLM Library are specific to the science and engineering population on campus, which has needs that differ from other departments (Leach, 2008). Group participation in professional development activities is demonstrated to improve working relationships between co-workers of various ages, ethnicities, and ability levels (Adams, 2009). Comments suggest there is an overwhelming sense the participants enjoyed the workshops. Anecdotal comments seem to suggest participants strongly appreciated the opportunities provided by the inreach/outreach workshops. The resources seem less abstract, intimidating, and unrelated to the library mission. An unanticipated outcome may even be to foster communication and to improve working relationships with across the staff in UNR Libraries. A 1999 study identifies the benefits of open communication channels and good working relationships between co-workers in academic libraries (Murray, 1999).

Looking at the survey responses suggests that without stating our motives outright, some of the comments correlated directly with our goals. They arrived at these conclusions on their own. While we did not receive negative feedback, some of the additional comments can be used to improve future engagement sessions. Because the lendable technology session was more of a “free for all” environment, not everyone got to use some of the tools available. Also, because the lendable technology was set out on a table in a relatively small area, crowding was an issue. In the future ample space for each piece of lendable technology should be provided.

Attendees were appreciative we brought the event to them. Librarian and staff time is limited: bridging the physical gap between spaces reduced barriers to exposure to and interaction with the available technologies, providing a convenient opportunity for MIKC staff to engage with DLM makerspace technologies. Future work could include additional sessions in both libraries, either on an annual or once a semester basis. Having advanced follow-on sessions at DLM would allow for participants to go hands-on with technology at DLM which does not lend itself to mobile presentation. The laser cutter, PCB machine, 3D Printers, and vinyl cutter are not easily moved and were not brought to the session. Having future sessions at DLM could further reinforce understanding the workflow between formulating an idea, designing the object, then creating the object through 3D printing, laser cutting, and so on – seeing each phase in process across the floors of the library.

Another outreach idea is to further engage the Savitt Medical Library, a second branch library on campus, by having related sessions in their space. DLM and Savitt are located on far ends of the campus, creating an even greater physical gap. Nevertheless, a link exists here as well – Medical school staff and students are already active users of DLM’s 3D printing services. Students preparing for medical school take many biology and chemistry classes and many of these physical materials reside in DLM’s stacks so there is incentive for DLM and Savitt to have increased relations.

In conclusion, the DLM Library serves the physical science and engineering communities on campus at the UNR, and provides many non-traditional library resources which can seem abstract, intimidating, or even unrelated to the library mission. In order to enable other library faculty and staff on campus to experience these

resources, DLM staff is experimenting with offering a series of internal outreach workshops at the MIKC. The first pop-up maker technology workshop took place in June 2015 and included three sessions. Attendees were asked to give feedback on the sessions and evidence suggests the event was a potentially powerful mechanism for engaging and informing MIKC staff about the resources and technology DLM provides. This outreach approach may prove valuable for other academic libraries to create awareness of non-traditional resources among its library colleagues.

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