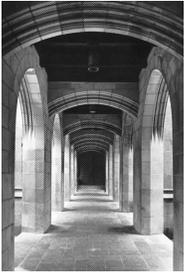# MAKERSPACES@YOUR SCHOOL LIBRARY: CONSIDER THE POSSIBILITIES!

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*H*ave you wondered why the Maker Movement is creating such a stir in the library and educational communities? If so, perhaps you should visit a Makerspace or Hackerspace in Louisville or Lexington and explore these vibrant, self-sustaining community centers engaged in activities that focus on the application of important skills in the "STEAM" areas (science, technology, engineering, arts and mathematics). In Louisville, the LV1 Hackerspace meets regularly and events are posted on meetup.com. Also in Louisville, the Kentucky Museum of Art and Craft hosts a regular Maker event on the second Sunday of every month. Kre8now is the newly formed Makerspace in Lexington, which meets regularly and offers classes in welding, CNC, and electronics.

Like libraries, Makerspaces are community resource centers – providing facilities, tools, and technical expertise for creating new and innovative products. Unlike libraries, however, Makerspaces require membership fees and are not free and open to public use. Also, these Makerspaces primarily serve the adult community and are not geared toward the educational needs of young children. But, what if school libraries and Makerspaces were to combine, thus creating a child-centered space for hands-on application of science and technology concepts right in the school building? Such a project would further the transformation of the school library from a warehouse of books and audiovisual materials to a place of hands-on inquiry and participatory learning.

Many school librarians are intrigued by the idea of integrating a Makerspace into a library facility because it is another way to connect library resources with inquiry learning, which is the fundamental philosophy of 21st century learning. The American Association of

School Librarians *Standards for 21st Century Learners* document emphasizes the importance of developing inquiry skills in a collaborative environment that is rich in information tools and resources (2007). By championing the concept of Makerspaces, school librarians can lead the way to innovation, address 21st century learning, and model implementation of the new Common Core science standards in engineering design. As school libraries make the transition from print to digital resources, a more flexible space can be made available for developing and supporting a Makerspace and associated STEAM educational programs.

Many educators believe that informal environments like Makerspaces support deeper, more meaningful learning in STEAM disciplines, as opposed to receiving information through a textbook or formal lecture (Gershenfeld 2007). Because activities in Makerspaces focus on technical applications of art, science, and technology concepts, STEAM learning is made less abstract and easier to understand – potentially attracting a wider population of young people to these fields (Britton 2012).

An example of how a Makerspace can be integrated into a school library facility is the "Michigan Makers" afterschool program, based in the East Middle School library. In the 2012-2013 school year, this group of students-turned-makers explored many kinds of desktop manufacturing tools such as sewing machines, Arduino microcontrollers, and three-dimensional printers to design, prototype and produce a variety of innovative technology applications. Throughout the year, the students reflected on their activities and posted them on their Michigan Makers Blog. In a sample entry about programming using the Arduino microcontroller, one blogger stated:

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The [Arduino] lesson was successful partly because we have a great place to work in at the school's library, partly because the Arduino is such cool technology, but especially because of our big kid coaches, the ninth graders that are expert in Arduino and were so great at helping troubleshoot, help kids understand things, and even bringing in their own Arduino projects to show off. It is incredible to see all of the kids get so excited about this technology, because there are so many possibilities for applying the knowledge they are building (2013 par. 6).

MAKING SPACE FOR A MAKERSPACE

There are many different levels at which school libraries can be involved in the Maker movement and support STEAM learning activities. For example, in communities where Makerspaces are vibrant community centers, school libraries can support students' interests by developing a library collection following Makerspace and STEAM themes. Collection building should focus on the nuts and bolts of starting a Makerspace, including guidebooks for projects in the STEAM areas, and any related materials in multiple formats that occupy the 500, 600, 700 sections of the library collection. Support for community Makerspaces can be expanded through regular visits by students and school librarians to local Makerspaces with information related to the library's collection of Maker resources and programming. This type of outreach has the potential to develop a successful partnering of resources, expertise, and facilities. Either hosting or staffing a booth at a Maker Fair, where Makers gather to show off their projects, is also an effective means to support the Maker community and STEAM learning. As part of library advocacy and outreach programs, school librarians can assemble kits and portable programming materials to offer "Pop-up Makerspace" activities in classrooms or other areas of the school. Finally, if your school library has space and resources to develop a Makerspace, attracting a new population of patrons to use the tools and resources inside the space and participate in programming activities is an easy task. According to David Loertscher, Makerspace programming in school libraries can transform libraries into spaces to "create, build, construct, do, and express all kinds of both personal and collaborative products" (2013 45).

WORDS OF ADVICE FOR FUTURE MAKER-LIBRARIANS

The school library as Makerspace is a new concept in library services and there are some serious issues to consider when wading into these uncharted waters. Primarily, schools should consider the liability involved with housing potentially harmful tools and equipment, the expertise required to maintain equipment and train students in their use, and how to program STEAM-related Makerspace activities so that they effectively introduce STEAM concepts and spark interest in STEAM careers.

With liability high on the priority list of every public institution, public libraries with established Makerspaces, such as the Westport Public Library in Connecticut or the Allen County Public Library in Indiana, have liability waivers and user agreements that can be used as a model for schools and districts to follow. The Michigan Makers club at East Middle School requires a permission slip and parent orientation. These agreements can be found on most websites connected with library Makerspaces. It is good practice to have a waiver and user agreement in force before any Makerspace programming takes place in the school library.

Space and facilities are always a primary consideration for any innovative school programming initiative. School librarian Leslie Preddy (2013) offers a number of suggestions to consider when planning Makerspaces:

1. Adequate space for autonomous activity, storage, and instruction – Preddy suggests creating a space for students to be autonomously productive and active in a space that can be used for multiple purposes and is easy to clean.
2. Adequate lighting and electrical outlets – Considering that technology will play a key role in most Makerspace activities, Preddy suggests a well-lighted space with room for students to spread out and work on projects, and with plenty of electrical outlets for tools and computer technology.
3. Flexible, mobile, convertible furnishings – To create a flexible Makerspace in the library or one that can "pop-up" throughout the school building, Preddy suggests that furniture be as mobile as possible.
4. Self-instruction via library resources, DVDs, pathfinders, etc. – From the beginning, Maker-Librarians should develop the school library collection to support and create interest in Makerspaces. Preddy suggests

that both physical resources (such as how-to books and DVDs) and virtual resources (such as pathfinders and websites) be part of the library collection.

When considering the staffing and program development required for the Makerspace, East Middle School Maker-Librarian Rachel Goldberg emphasizes the importance of enlisting a core of volunteer mentors to assist students with their projects and help them develop their ideas. She suggests tapping resources found in local high schools, universities, and community groups who have an interest in Makerspaces. According to Goldberg, "Partnering with enthusiasts and giving them a space to share their craft with young people is an excellent way to build community relationships and develop lasting partnerships" (2013, par. 4).

IMAGINE IT! DO IT!
Makerspaces in school libraries that support 21st century learning strategies and STEAM content have the potential to disseminate interest in science, technology, art, and mathematics to a large number of students, including minorities and youth from low-income families who are under-represented in careers

from these subject areas. School libraries have a long tradition of serving the education and information needs of the school community, and providing free programs and services for all. There are many ways school libraries can support Makerspaces and STEAM learning, from stocking library shelves with books and magazines and arranging school visits to community Makerspaces and Maker Fairs, to housing a full-fledged Makerspace in the building. Given the financial, physical space, and staffing needs associated with leading the way in educational innovation, what is required is for school libraries to imagine the different possibilities for supporting Makerspaces and STEAM-related programming in their own communities. In a recent issue of Teacher Librarian, David Loertscher advises school librarians to ride the wave of innovation:

As teacher librarians we can embrace new and innovative ideas or allow them to grow up around us, excluding us, ignoring us, or we can embrace, join, encourage, and move to the center of both serious academics and the exciting movements in education. It's our time folks (2013, p. 48).

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KEY RESOURCES FOR KICKSTARTING A MAKERSPACE
Makerspaces: A new wave of library services. ALA TechSource Webinars – A four part series of webinars on Makerspaces from alapublishing.webex.com

Makerspace.org – Comprehensive resources for developing Makerspaces and Makerspace programming including the free *Makerspace Playbook* ebook guide.

Makerbridge – Comprehensive resource for those involved in community Makerspaces from http://makerbridge.si.umich.edu/

Preddy L. (2013). *School library makerspaces: Grades 6-12*. Santa Barbara, CA: Linworth. Available in October, this guide provides programming ideas and advice for implementing a Makerspace in a middle or high school library.

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