FEATURE

Expanding School Library Collections

The Makerspace Edition

Nikki D. Robertson
nikki@nikkidrobertson.coml

Weeding, updating, and expanding our school library collections is an ongoing curation process rarely seen by those we serve; yet it's a critical management task that ensures our libraries are positioned to provide the best resources and services to our patrons today and in the future.

The Internet and the advent of e-books have launched our school libraries beyond brick and mortar, allowing patrons 24/7 access to the resources they seek. With these technological advancements, an often-iterated question arises as to the relevance of libraries and librarians now that access to information previously available through print, reference, and special collections in libraries is now accessible via handheld devices.

With this in mind, how can we best articulate and actively demonstrate to the world at large, and more importantly to our teachers, administrators, parents, and students, the critical role fully functioning, well-staffed school libraries play in the development and support of innovative teaching and actively engaged, critically thinking students? Makerspaces provide one avenue through which we can dispel this misinformed question of relevance.

Going beyond "Ooh Shiny"

Makerspaces hit the school library scene around 2014 and became the hot thing to incorporate into school library spaces. Many of us, including myself, jumped on the makerspace bandwagon, purchasing makerspace-y things and then wondering in dismay why the initial bubbling of excitement quickly fell flat. My own initial botched makerspace implementation was caused by short sightedness in visualizing a makerspace as a "thing" to have in the library, rather than a collection to be vetted and curated with the same care and regard as any other library collection.

Makerspaces and school librarians are poised to lead learners into the rapidly changing societal needs from the coming Fourth Industrial Revolution. While the Third Industrial Revolution ushered in computers and information technology, the Fourth Industrial Revolution distinguishes itself by the unprecedented speed with which new technologies extensively impact the way we learn, live, and work:

> New technologies like artificial intelligence (AI), 3D printing, and robotics are emerging with the potential for having a transformative impact on industry, the economy, and society as a whole. The speed and scope of this technological transformation is exponential with the potential for unlimited possibilities and endless opportunities. What are the implications for schools, educators, and students? How do we redefine career readiness and better prepare students for an uncertain future? (Vander Ark, Schuler, and Swanson 2018)

When considering the development of a makerspace collection in our school libraries and beyond, it is crucial to our students' lifelong well-being to go beyond the "Ooh, shiny" that comes with 3-D printers, robots, and LEGO walls and examine the overall purpose, learning goals, and scope of a makerspace, as well as its impact on future lifelong learning.

Making Space for a Makerspace

Determining the location of your makerspace should follow the same thought process used when deciding on the purpose, location, and arrangement of other library collections. Where is the best location for nonfiction books? What about chapter books and everybody books? What about genre-fied sections? Where are the storage rooms where professional books, kits, and electronic equipment are purposefully arranged in a manner that best serves the needs of patrons? The same thought to other collections should be made when determining where to put the makerspace.

When contemplating where the makerspace collection will physically be accessed by patrons there are several factors to consider. Will the makerspace be a static part of the physical landscape of the school library, or will it be mobile in nature? Will the overarching purpose of the makerspace be to serve as part of the school library, as a curricular support, as an after- or before-school program, as a club, or in some other capacity? Answering these questions will help define the type of space that best suits the needs of your particular makerspace.

Sandy Brand, librarian at Liberty Middle School in Madison, Alabama, repurposed a room inside her school library to serve as the makerspace. Students are welcome to use the makerspace before, during, and after school. Fueled by their own curiosity, students at Liberty Hill Middle School use this space to explore, discover, tinker, build, and learn as they pursue their own educational passions (Brand 2015).

Heather Fox, librarian at Amana Elementary and Community Library in Amana, Iowa, put wheels on her makerspace by transforming book carts into a mobile makerspace. Heather's mobile makerspace provides flexibility for the makerspace resources to be used within the school library or in classrooms as a curricular support resource (Miller 2017).

While serving as the librarian at Stewart Middle Magnet School in Tampa, Florida, Diana Rendina completed a library renovation worthy of being featured on HGTV (although it wasn't). Paint, new flexible furniture, whiteboard wall, epic LEGO wall, and repurposing the library space, including storage rooms, brought Diana's makerspace vision to life (Rendina n.d.).

Elissa Malespina, former librarian at Somerville Middle School in Somerville, New Jersey, overcame a severe shortage of space in her school library by transforming the tops of the low bookshelves into a makerspace. This space worked well in the middle school environment as students could easily see and work with the items displayed (Malespina 2016).

Gwyneth Jones, librarian at Murray Hill Middle School in Howard County, Maryland, repurposed empty study carrels to create cozy makerspace cubbies (Jones 2015).

Darcy Coffta, Innovation Center Director at Berwick Academy in South Berwick, Maine, tore out the circulation desk in her library to create room for a makerspace. Darcy decided that laptops and smart devices could be used as self-checkout stations and repurposed the mammoth circulation desk, which was outdated, into a makerspace, making better use of that space (Follett 2019).

Look around your library and reimagine the space. What areas can be repurposed? Where could you weed other library collections that could help free up space? What areas have become obsolete and unnecessary given the new technologies available for use in our modern school library settings?

Lisa Mele, librarian at Van Hoosen Middle School in Rochester Hills, Michigan, turned extra bookshelf space into makerspace storage (Mele 2019).

Denise Gallegos, educator in Brownsville, Texas, lucked into one of those sturdy cardboard back-to-school–type display cases (with wheels) sitting in the back of a store waiting to be taken away with the trash! This rare find would lend itself perfectly as a storage unit for makerspace supplies (Gallegos 2019).

Let the Wild Rumpus Begin

Finding your footing when embarking on creating a makerspace for your school library can seem like an overwhelming task, especially with limited space and budgets. Before placing orders and hunting yard sales for makerspace items, slow down and take a moment to clarify the purpose behind creating a makerspace. Once your purpose has been solidified you can start working on procuring the needed supplies.

I have created a makerspace at both the high school and elementary school. As you can imagine, the purpose for each makerspace was vastly different. At the high school level my focus was to create hands-on opportunities to create, build, and print with a 3-D printer; apply coding skills to robots; and provide a place where students could take the time to explore their own passions through creating. With this purpose in mind I worked toward securing a 3-D printer, robotics equipment, Arduino and Raspberry Pi kits, a sewing machine, as well as games and arts and crafts materials.

At the elementary level the school library was part of the specials rotation. This type of schedule does not, in my opinion, provide the flexibility needed for a true makerspace. Knowing the skills and learning opportunities a makerspace provides for students, I was determined to carve out a way for students to not only receive regular library services, but also provide makerspace-inspired explorations. Through the development of centers I was able to achieve this goal for my students. During each library visit, students rotated through a variety of learning centers. Some of the centers taught students library skills, while others touched on different curriculum-connected makerspace activities, including green screen, robotics, augmented and virtual realities, coding, and more. Free center days provided students with the opportunity to revisit and further explore their favorite makerspace center activities.

At both the high school and elementary school I was fortunate to have some financial support from the administration. Additionally, I received rather generous donations from parents (and grandparents) as they learned more about the school library and our activities from social media, visiting and volunteering, and their children excitedly telling them about what they did in the library that day.

Other suggestions for securing funding and supplies include asking your PTA, parents, and local companies (especially those in the tech field); launching a fund-raising project through sites like Donors Choose; and sifting through yard sales and thrift stores. Additionally, be sure to search through the hidden rooms and storage closets at your school. You'd be surprised how many items have been relegated to storage that are valuable additions to your makerspace.

Edward Clapp, senior research manager on the Agency by Design initiative at Harvard University, states: "You don't need a laser cutter or a 3-D printer" (Iasevoli 2018). While it might be exciting to procure a high-ticket item for your makerspace, school librarians

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should examine the functionality and versatility of various items for learning opportunities before making purchasing decisions. Clapp goes on to say, "The most important [makerspace] tool for any teacher/librarian is the framework of thinking and learning" (Iasevoli 2018).

The Missing Piece

School librarians have long been the go-to person for a variety of classroom curricular supports, so it is only natural that, with the advent of makerspaces, librarians are poised to lead the way. As the leaders in the makerspace movement it is important for school librarians to work diligently to ensure that makerspaces are integrated throughout the curriculum, not squeezed in as a "library thing," club, before- or after-school activity, or other limiting activity that sends a message that makerspaces are a separate entity with little to no connection to overall learning in a school.

Diana Rendina, media specialist/teacher librarian at Tampa Preparatory School, an independent 6–12 school in Tampa, Florida, adds that librarians and teachers working within the makerspace realm should "allow for open exploration and student choice in projects and pursuits" (Rendina 2019).

Two factors for successful integration of makerspaces into the overall classroom curriculum are collaboration and flexibility. Connecting and collaborating with other teachers in your school or district and establishing global connections provide teachers with a valuable support system and opportunities to gain inspiration from members of their professional learning network. Flexibility within the library schedule provides opportunities for relevant, timely, and relatable makerspace opportunities.

The following example details how a school librarian demonstrated collaboration and flexibility to meet learner and curricular needs:

> Kristi Merchant, library media specialist at George Washington Carver Middle School in Tulsa, Oklahoma, demonstrated the importance of a flexible library schedule for relevant and timely learning collaborations when Kristy was having a casual conversation with a science teacher and an English teacher at her school. Through this conversation Kristi learned that the upcoming science unit was about animal habitats. Kristi had recently watched the movie *Fantastic Beasts and Where to Find Them* and mentioned the correlation of the beasts and their habitats in the movie to the upcoming habitat unit. Together the three concocted an idea for an interdisciplinary project. "Students could use the library to research real-life unusual beasts, and then have that beast interact with a character from the Harry Potter series." Students could then let their creativity shine in the makerspace to create videos, craft, build, code, and so much more to bring their research to life. (USC Rossier School of Education n.d.).

Zero Waste

Teaching effective use of makerspace resources is not only a necessity regarding a school library's budget, it's also a requirement to maintain your sanity. Have you ever given a kindergarten student a bottle of glue? Enough said.

At a recent TCEA Elementary Technology Conference in Galveston, Texas, Jessica Varela, first-grade teacher at The Lamplighter School in Dallas, presented a session titled, "Design Thinking and Makerspace in the Primary Classroom." To ensure effective use of makerspace resources, Jessica developed a badge system where "students can earn badges for the tools they become experts in and can then teach others, or use the tools unsupervised" (Varela 2019).

On a Facebook post, Jennifer Brower, innovation and media services specialist from Indiana, shared a design thinking approach to makerspaces to help keep resource waste to a minimum. For this particular activity students were tasked with creating a major cardboard project. Before building their project, students had to plan, test materials, create a prototype to a panel composed of teachers in the school, do a quick presentation about their prototype plans to a panel, and address any concerns the panel had regarding their plan. Only after panel approval were teams granted access to the actual materials needed to build their final project. Jennifer stated that she wanted students to at least have a plan and know what materials they would need for their project rather than just going all out and without a clear vision in mind (Brower 2019).

Colleen Graves, content creator at Makey Makey/Joy Labz, contributed to the same Facebook post as Jennifer, recounting that she once set out all of the makerspace supplies she had worked diligently to gather, sort, organize, and label over a two-week period of time. The first class to access the makerspace demolished and consumed the majority of the supplies. Following this incident, Colleen started giving kids an amount to spend to "purchase" their resources (Graves 2019). I love this idea from Colleen as it afforded her the opportunity to teach financial literacy through the makerspace.

That's a Wrap

Adding a makerspace to your school library benefits the school as a whole and meets eight of the ten Future Ready Librarians Framework strategies. Specifically:

- Learner centered
- Use of space and time
- Budget and resources
- Community partnerships
- Personalized professional learning
- Collaborative leadership
- Curriculum, instruction, and assessment
  - Empowers students as creators
  - Builds instructional partnerships (n.d.)

Additionally, revisioning your makerspace as a library collection helps to meet the AASL qualities of well-prepared learners and dynamic school libraries. Specifically, by providing access to a well-managed makerspace collection, school librarians clearly connect academic knowledge and deeper understanding with this space and its resources.

If you haven't yet created a makerspace in your school library start by creating a strategic plan. If you have already established a makerspace in your library, conduct a self-evaluation of your makerspace and set goals and next steps for the new school year.

Nikki D. Robertson *is the project coordinator of digital learning at ESC 13 in Texas. Nikki is a veteran educator, school librarian, Google Certified Trainer, and past president of ISTE's Librarians Network. She is the co-founder of the first EdCamp Atlanta and has also collaborated in the creation of and moderation of national and global professional development opportunities designed specifically for the unique needs of school librarians, including #TLChat LIVE! Twitter Chat Sessions and TL News Night. Nikki is the recipient of several honors, including an ASLA Ann Marie Pipkin Technology Award and the AASL Bound to Stay Bound Grant, and she was named the 2018 Program Pioneer Social Media Superstar by AASL. Nikki wrote the book* Connected Librarians: Tap Social Media to Enhance Professional Development and Student Learning.

Works Cited:

Brand, Sandy. 2015. "Liberty Middle School Makerspace WHNT." YouTube (Sept. 15). <www.youtube.com/watch?time_continue=76&v=yvcOCsKxSDU> (accessed August 6, 2019).

Brower, Jennifer. 2019. Facebook comment (June 20). <https://www.facebook.com/groups/librarymaker/permalink/2893995837340108> (accessed August 28, 2019).

Follett, Britten. 2019. "It's Vital Your Makerspace Reflects the Culture of Your School." *TechThought* (Jul. 31). <www.teachthought.com/learning/its-vital-your-makerspace-reflects-the-culture-of-your-school/> (accessed August 6, 2019).

Future Ready Schools. n.d. "Future Ready Frameworks." <http://www.futureready.org/about-the-effort/framework> (accessed August 15, 2019).

Gallegos, Denise. 2019. Facebook comment (June 20). <https://www.facebook.com/groups/librarymaker/permalink/2893995837340108/> (accessed August 29, 2019).

Graves, Colleen. 2019. Facebook comment (June 20). <https://www.facebook.com/groups/librarymaker/permalink/2893995837340108/> (accessed August 29, 2019).

Iasevoli, Brenda. 2018. "'I Can Do That!' How Maker Spaces Teach Students to Redesign Their Worlds." *Education Week* (July 27). <blogs.edweek.org/edweek/curriculum/2018/07/i_can_do_that_how_makerspaces.html> (accessed August 15, 2019).

Jones, Gwyneth. 2015. "Makerspace Starter Kit." *The Daring Librarian* (June 26). <www.thedaringlibrarian.com/2015/06/makerspace-starter-kit.html> (accessed August 6, 2019).

Malespina, Elissa. 2016. "Somerville Middle School Library Makerspace." YouTube (May 12). <www.youtube.com/watch?time_continue=6&v=03mEHG3e92s> (accessed Aug. 15, 2019).

Mele, Lisa. 2019. Facebook comment (June 20). <https://www.facebook.com/groups/librarymaker/permalink/2893995837340108/> (accessed August 29, 2019).

Miller, Shannon McClintock. 2017. "Update....Let's Follow Heather in Her Makerspace Journey in the Amana Elementary Library!" *The Library Voice* (July 20). <http://vanmeterlibraryvoice.blogspot.com/2017/07/follow-heather-as-she-creates.html?m=1> (accessed August 29, 2019).

Rendina, Diana. 2019. "The Renovated Learning Philosophy of Makerspaces." *Renovated Learning* (Apr. 14). <www.renovatedlearning.com/2019/04/22/philosophy-makerspaces/> (accessed August 15, 2019).

Rendina. Diana. n.d. "The Stewart Makerspace Journey." *Renovated Learning*. <www.renovatedlearning.com/our-makerspace-journey> (accessed August 15, 2019).

USC Rossier School of Education. n.d. "How to Sync Your Makerspace with Your Curriculum." <http://rossieronline.usc.edu/maker-education/sync-with-curriculum/> (accessed August 15, 2019).

Vander Ark, Tom, Dave Schuler, and Jason Swanson. 2018. "Fourth Industrial Revolution & the Impact on Education." CoSN Webinar. <cosn.org/events/webinars/fourth-industrial-revolution-impact-education> (accessed August 15, 2019).

Varela, Jessica. 2019. "Design Thinking & Makerspace in the Primary Classroom." Session presented at the TCEA Elementary Technology Conference, Galveston, TX.

Recommended Reading:

Future Ready Librarians. n.d. "Empowering Leadership for School Librarians through Innovative Professional Practice." <https://futureready.org/wp-content/uploads/2017/01/Library_flyer_download.pdf>.

Gilchrist, Alasdair. 2016. *Industry 4.0: The Industrial Internet of Things.* Apress.

Linnhoff-Popien, Claudia, et al. 2018. *Digital Marketplaces Unleashed.* Springer.

School Fab Lab Makerspace. n.d. "Fourth Industrial Revolution." <www.schoolfablab.com/fourth-industrial-revolution>.

Study International Staff. 2019. "5 Cool Makerspaces That Will Make You Wish Your School Has One." *Study International* (Feb. 28). <www.studyinternational.com/news/makerspace-international-school>.

Study International Staff. 2019. "How Can Schools Prepare Students for the Fourth Industrial Revolution?" *Study International* (May 30). <www.studyinternational.com/news/how-can-schools-prepare-students-for-the-fourth-industrial-revolution>.

Sullivan, Margaret. 2019. "The Monthly STEAM Challenge." *Knowledge Quest* (Jan. 7). <knowledgequest.aasl.org/the-monthly-steam-challenge/>.

Turnipseed, Stephan. 2018. "Preparing Young Learners for Life Beyond the Fourth Industrial Revolution." *Education Reimagined* (Oct. 25). <education-reimagined.org/life-beyond-fourth-industrial-revolution/>.