A Maker Culture

Flexible makerspaces teach students to take risks, inspiring a deeper form of learning.

By Laura Fleming

The Maker Movement, which originated as communal, community work spaces, has served as an impetus for school leaders to critically reflect on their school's learning spaces. Do they meet the needs of learners today? Do they foster and inspire creativity, provide flexible opportunities to learn, and address unique and specific interests? The resulting makerspaces encourage open-ended exploration, providing unique learning environments that best serve 21st century learners. Used as they were originally intended—as open, communal environments dedicated to making of all types—makerspaces are indifferent to distinctions such as academic potential, social barriers, and even levels of language development, allowing the opportunity for every child to invent, tinker, create, innovate, make, and do.

Makerspaces can take countless forms, with some being on a cart, in a box, in a section of a library, in a separate room, or even in a hallway. Others are weaved into the culture of the school and are not separate spaces at all. The space should be stocked with materials, resources, and supplies that are unique to each individual space, and that inspire and allow for an environment rich with possibilities. No matter the location, the common thread between these spaces should be that specific activities do not define them. A visit to a makerspace should leave you with the impression that the possibilities are endless.

Principal Support

Successful school makerspaces generate a genuine and committed culture of innovation that is present within the makerspace itself, and also proliferates and extends out into the entire school community. Executing this requires that school and district leadership are able to offer a trusting, relatively autonomous space within which educators and students can take risks. A "maker culture" requires innovative spaces that support it. This means allowing teachers the flexibility to create different, adaptable, and unique learning environments that work for students.

The Maker Movement in schools can only be successful with the help of school leaders who encourage the value of innovation in and by students, and who also recognize that teachers need the freedom and the autonomy to be innovative as well.

Many educators shrink from developing makerspaces because they do not have the support of their school leader. Oftentimes, school leaders dictate mandates such as requiring specific learning objectives in a makerspace, which threatens the integrity of an open-ended learning environment. The consequence is that educators either choose to create a hybrid makerspace, in name only, or don't attempt a makerspace at all.

Educators and school leaders alike often worry how students might be appropriately assessed in maker environments. This fear is the result of a reliance on traditional methods of assessment as the only valid means to measure learning. Rather than focusing on just formal assessment, consideration should be given toward focusing on acknowledging the granular skills students gain in this space, as well as the attitudes, the willingness to collaborate, and the confidence gained, and providing a way for students to get credit for, celebrate, and validate all that learning.

The role of a school leader is vital in both allowing for and nurturing a school's maker culture. Principals who

I have worked with have understood that making is a process—at times messy and unpredictable—that ultimately leads to learning that students value, sometimes above anything else they have ever learned before. Effective school leaders cultivate an environment that offers the freedom to learn from failure in order to grow and become better.

Innovative Learning

The Maker Movement embodies opportunities for experimentation and innovation to occur across all grade levels and in all content areas. The approach should not be restricted to science, technology, engineering, and math (STEM) subjects; it is as relevant to literacy and artistic creativity as it is to science and engineering. My own point of entry into the Maker Movement was through literacy, with my students mashing up, remixing, and creating digital stories.

The Maker Movement offers new approaches to instruction, one in which teachers give up control and understand that they need not be the single vessel that delivers the instruction of skills. Maker activities target the interests of all students and particularly tend to impact those who thrive in nontraditional learning environments. Students should never have to earn a chance to visit a makerspace; it should be a learning environment free of barriers that creates accessible opportunities for all students. My greatest makers have been the students who have been the most disengaged throughout their entire school career. The iterative design process that is used in makerspaces allows students to become problem-solvers and inventors beyond the makerspace itself. Students are encouraged to think creatively, collaborate, and problem-solve. This cultivated mindset ultimately affects the way they view and approach learning in all settings.

Makerspaces offer new challenges that underscore the acquisition of social, shared learning experiences undertaken by the learners themselves. Risk-taking is encouraged as learners push their skills outside of their comfort
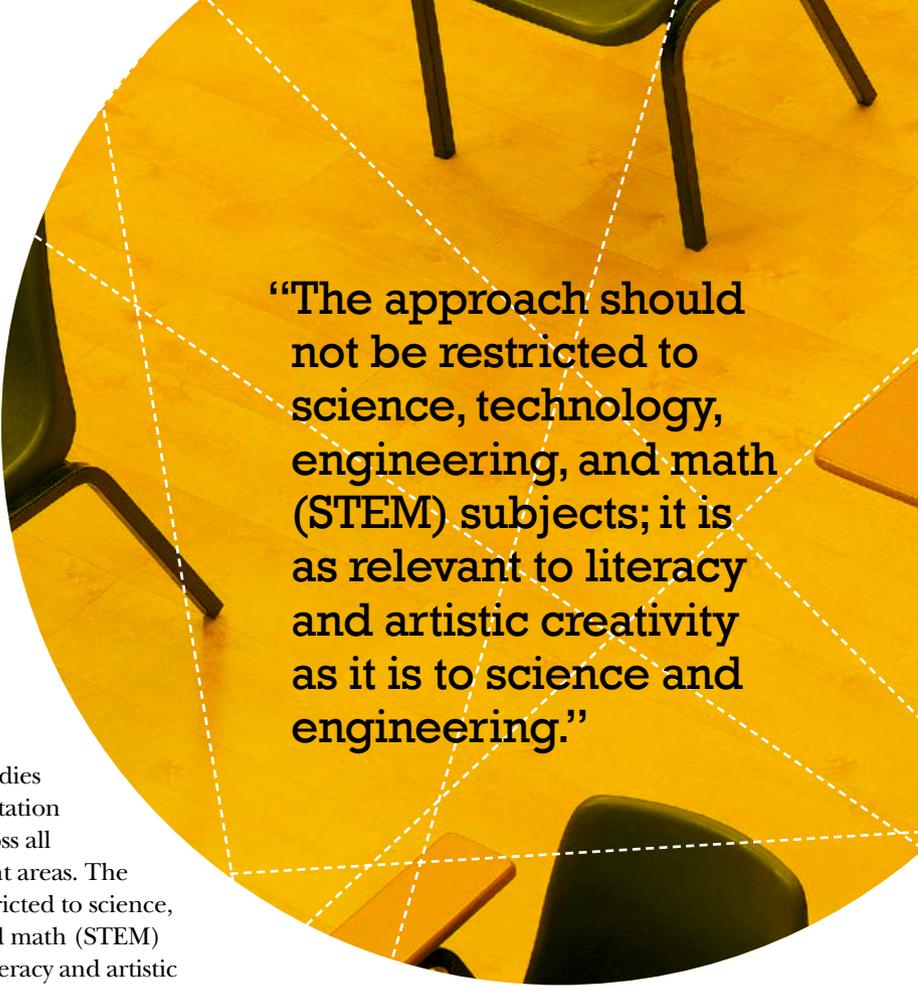
zone, allowing for real skill progression. Clear-thinking and confident educators can discover ways to blend the maker mindset into the core curriculum. This includes allowing all students the opportunity for open-ended exploration, leveraging informal learning environments, and embracing open-source ideology, which democratizes access to tools and resources for all students. Educators benefit from the support of school leaders in adjusting their curricula and their teaching practice in order to reflect the principles related to making.

Make It Work

Many schools purchase items for a makerspace without putting time and effort into planning the space. Effective planning will ensure that the space is vibrant and sustainable. This process is not a top-down initiative, but rather begins with the voice of the learner.

1. Understand your learners. Before creating a makerspace, find a way to evaluate the needs, wants, and interests of the students in your school. Get a pulse on the kinds of activities they enjoy, both inside and outside school. What are their hobbies? What extracurricular activities do they participate in? What kinds of opportunities do they wish they had? Evaluating your learners can be done both formally and

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WEB TOOLS
Want to implement the ideas in this article? Access the following resources to deepen your knowledge.

• **Maker Ed.** This non-profit association's website features project ideas and curated, introductory resources for those new to making. **makered.org**

• **Renovated Learning.** School media specialist Diana Rendina's blog charts her school's makerspace journey and provides resources and project ideas. **renovatedlearning.com**

informally. This can include conversations with students or through a formal needs assessment survey.

2. Assess the current learning experience. In planning for a makerspace, time should also be spent evaluating the programs, offerings, and curricula within your school, as well as the standards they address. What experiences and practices does your school already offer? What experiences and areas of learning does it lack? This process will ensure that strong curricular connections will be made through use of the space.

3. Consider global trends and best practices. Consider what is happening in the world—both inside and outside of education—that you think your students would benefit from having exposure to. Being active on social media can provide a pulse on what is happening in education and other spheres of influence. News headlines; articles about trends in education, business, and technology; and professional conferences can uncover some unique and innovative opportunities for your makerspace as well. For example, we developed flight as a theme for our makerspace because of the worldwide attention to drones.

4. Develop themes. Many people take a resource-driven approach to developing a makerspace, but a thematic approach to planning a makerspace is what will ensure that it is relevant to your school community, is sustainable, and will lead your school into the future. Themes also allow your students opportunities to dive deeper into their learning, because of the wide range of resources, materials, and supplies that you will gather to best support your themes.

To create themes, gather, organize, and analyze the information you collected from the first three phases of the planning process into categories that will resonate with your learners. Don't feel obligated to base themes on STEM-related concepts. Some schools have adopted themes such as shopping, whimsy, and community service.

5. Procure equipment and materials. The creation of themes not only benefits learners, but also streamlines the process of ordering supplies. Makerspace resources can fit any budget. I have seen makerspaces stocked with items from a local dollar store, or through donations from the wider school community. Many schools have turned to crowd-funding or grants for big-ticket items.

Some of my favorite makerspace items have included what we already had at our school, such as computers that would normally have been discarded. It is also possible to create a virtual makerspace by leveraging the free resources that are available on the Web. I also recommend the use of Open Educational Resources (OER), which provide your school with no-cost learning materials that can be modified or shared with others.

Some of the best resources we have had in our makerspace have been people. Through our "Hangout With a Maker" series, we have invited community members, companies, and other "expert" makers to demonstrate their skills and model for our students that makers can earn a living from their making. These interactions form community connections, both locally and globally, as well as ignite an entrepreneurial spirit in children.

A final step in getting started is integrating making into the teaching culture. Each school will want to handle the implementation and integration of makerspaces according to their unique circumstances. Consider short- and long-term projects, as well as having teachers embed making into classrooms year-round. Make sure to consider making in staffing, curriculum, and strategic planning meetings.

Transformed Learning

Makerspaces have allowed us the opportunity to change the way we think about school structure and function. In schools that want real and deep-seated pedagogical change, principals work with teachers, students, and the wider school community to transform learning spaces and environments so that they truly support the kinds of instructional changes desired. The Maker Movement has helped us re-envision and redefine the concept and the processes of learning and instruction.

Connecting students to the future requires changing the education system. The transformative potential of scaling up innovation and empowering our learners will position our students to be the central driving force of change in our schools. With the support of school leaders, makerspaces offer new horizons and opportunities that will help to propel our students into a brighter future and spark the passion for lifelong learning. **P**

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