Reframing Learning through the Maker Movement

Column

Do you remember the first time you fully grasped the idea that the Internet had become a place where you could interact with information and the people who posted it, rather just than passively receive information? Maybe you can picture the exact moment you noticed the shift; however, this kind of change doesn't happen overnight. Chances are, that moment was not the advent of Web 2.0. Similarly, makerspaces may seem to have only recently caught on, but community-based spaces have actually been gaining momentum since at least 2005 when the magazine *Make:* made its debut. In the school setting, the genesis of makerspaces is tied to the theory of constructionism, originated by Seymour Papert in the 1980s. Papert's view was that students learn best by using and making tangible objects for authentic reasons or to solve real problems (1987).

Imagine your administrator approaches you and offers $2500 with which to create a makerspace. When you finally return to reality after experiencing this "Oprah's Favorite Things" moment, resist the temptation to immediately spend the money. Instead, take a breath and start gathering stakeholders who will help you plan for this exciting opportunity. While research on makerspaces is still in its infancy, the work of Halverson and Sheridan and Moorefield-Lang can be a catalyst for thoughtful discussion and purposeful decision making among your group.

Halverson and Sheridan brilliantly break the makerspace movement down into three components: "*making* as a set of activities, *makerspaces* as communities of practice, and *makers* as identities" (2014, p. 496). They suggest educators look at makerspaces as a way to reframe the concepts of learning, learners, and the learning environment. One of their significant observations is makerspaces tend to be interdisciplinary and collaborative (Sheridan et al. 2014). They witnessed users who learned new skills they would not otherwise be exposed to because of the tools and people around them. For example, a student working independently may come to a point where he or she cannot work any further on the task at hand because of his or her current skill set. Being in a maker setting, the student takes stock of the space, determines the tools needed, and makes a plan to learn how to use these tools, either alone or with the help of a peer. Makerspaces "break down disciplinary boundaries..., leading to innovative work with a range of tools, materials, and processes" (Sheridan et al. 2014, p. 527). This is different than traditional learning in a classroom setting. As an example, it isn't uncommon for students in a science class to learn about electricity through hands-on circuitry work. However, when they observed circuitry work in a makerspace, it was "*used* to make a night-light, customize a bike, fix a game controller, and photograph the Earth from space," rather than every participant's learning the same thing for the same purpose (Sheridan et al. 2014, p. 528).

Something else to consider before you start shopping: K-12 makerspaces have different needs and requirements than those in community-based locations such as public libraries and museums. Beyond deciding what items and materials you provide, consider procedures for when students will access the space, as well as reasons a student would go there in the first place. This is really the heart of the matter—what is the purpose of your makerspace? There is no doubt students benefit from the opportunity to tinker, invent, create, and collaborate. Does that mean you can install a makerspace that has few if any restrictions or expectations?

As you grapple with these questions and wonder how makerspaces fit into the tight structure of the school day, think of this space as a conduit for inquiry. Inquiry-based learning is a successful instructional model with multiple studies demonstrating it is preferable to traditional teaching (Pedaste et al. 2015). Through inquiry, students have more autonomy as they identify problems and use multiple strategies to solve them. Questioning, experimenting, collecting data, analyzing results, and sharing conclusions are all part of inquiry-based learning (Pedaste et al. 2015). Inquiry "prepares students to think for themselves, make thoughtful decisions, develop areas of expertise, and learn throughout their lives" (Kuhlthau 2015, p. 4). Enter makerspaces, where students do exactly that.

One of the belief statements on the LA Makerspaces website states: "I believe in my ability to figure things out even when they seem hard or unfamiliar." Makerspaces promote a growth mindset and teach students that learning often comes as a result of not getting it right on the first try. This also happens to be good advice for educators who are installing a makerspace in their classroom or library. We encourage you to explore the growing body of research on the relationship between makerspace activities, inquiry learning, design thinking, and problem solving. *School Library Makerspaces in Action* is especially helpful (Moorefield-Lang 2018). It has examples of makerspace activities at early, middle, and upper grades. It also includes suggestions for student-led spaces, where to get training, and how to welcome all student populations into your space.

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