How to Define Success in Your Makerspace

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by Heather Lister

April 29, 2019

One of the hottest debates in maker education surrounds assessment. I get questions about it *a lot*.

- Is assessment going against the maker movement?
- How will I get administrators on board if I don't assess?
- Will my kids buy into the work if there isn't a grade?
- How and what do I even assess in a makerspace?

To Assess or Not to Assess?

It's no secret that education is borderline obsessed with assessments. Here in Pennsylvania, springtime means "testing season," which includes weeks of Pennsylvania System of School Assessment, Keystone, and AP exams. It's also no secret how much is riding on the outcome

of these assessments. The contents and results of these assessments drive everything from curriculum to funding and staffing to graduation eligibility. In addition to these end-of-year, high-stakes tests, students are assessed regularly via formative or summative assessments.

These practices send a very strong message that if something *matters*, it needs to be *measured,* and this message reaches more than just teachers. As a middle school teacher, I can't tell you how many times students would ask, "Is this going to be graded?" or, "How many points is this worth?" When I told them an assignment wasn't going to be graded, the motivation and quality of work dropped drastically. It was a constant struggle because my students were so accustomed to working for grades that if a project didn't have one, then it didn't matter to them how they performed.

At the same time, I worried that by assessing my students in a makerspace, I would have fewer risk-takers. With child and youth anxiety on the rise, I wanted to create a space where students could be imaginative, think outside the box, and be OK with their designs not working. If I assessed, would I be taking that away?

Changing the Way We Think About Assessment

When I was the librarian and makerspace coordinator at Hershey Middle School, I didn't assess students, although I can't say it was a conscious choice. I was so focused on just getting the space up and running that I hadn't given it any thought. However, after the second year, I began writing some grant proposals and I realized I had no data on how our makerspace was doing, aside from student usage. As a librarian who regularly provided my administrators with data on our library, I knew that student usage didn't tell a comprehensive story. And, beyond just telling the story of how our makerspace was performing, I realized that I wasn't giving students any real feedback on their making either.

If we think about the many assessments students complete throughout their school career, we see that these assessments are meant to provide them with *feedback* — feedback on where they're doing well and where they need to improve. The idea of assessing the work that students were doing in my makerspace became easier to swallow when I started to think of it as providing feedback instead of assessment.

The Changing Demand for Workplace Skills and What It Means for Assessment

I currently serve as a Senior Maker Fellow with the Foundry Makerspace in Harrisburg, Pennsylvania. As an educational makerspace, we partner with schools to implement STEAM and maker education. Because we're an outside organization, data is important to show our effectiveness in meeting our original goals. With an overarching goal of "building the

capacity of schools for 21st century life and work," we used research from the World Economic Forum, NESTA, Battelle for Kids (formerly known as Partnership for 21st Century Learning), and more to develop a profile of a successful individual in the 21st century.

In its most recent report, the World Economic Forum identified some eye-opening trends in the changing demand for workplace skills, as defined in the table below. Several other studies also emphasize the increased need for communication, collaboration, critical thinking, and creative skills — commonly referred to as the Four Cs.
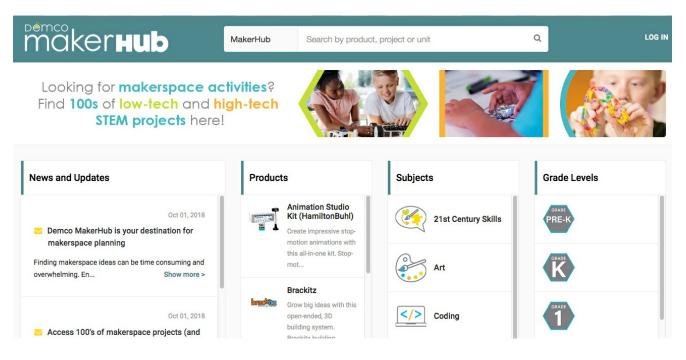
Table 4: Comparing skills demand, 2018 vs. 2022, top ten

Today, 2018	Trending, 2022	Declining, 2022
Analytical thinking and innovation	Analytical thinking and innovation	Manual dexterity, endurance and precision
Complex problem-solving	Active learning and learning strategies	Memory, verbal, auditory and spatial abilities
Critical thinking and analysis	Creativity, originality and initiative	Management of financial, material resources
Active learning and learning strategies	Technology design and programming	Technology installation and maintenance
Creativity, originality and initiative	Critical thinking and analysis	Reading, writing, math and active listening
Attention to detail, trustworthiness	Complex problem-solving	Management of personnel
Emotional intelligence	Leadership and social influence	Quality control and safety awareness
Reasoning, problem-solving and ideation	Emotional intelligence	Coordination and time management
Leadership and social influence	Reasoning, problem-solving and ideation	Visual, auditory and speech abilities
Coordination and time management	Systems analysis and evaluation	Technology use, monitoring and control

Source: Future of Jobs Survey 2018, World Economic Forum.

As an organization, the Foundry determined that if the Four Cs are the skills our students need to be successful in the 21st century workforce, then those are the skills on which we should be providing feedback.

What was also important for us to recognize was that our assessments needed to focus on the *process* not the final product. This would allow our students to take risks and allow teachers to recognize that students can still learn a great deal even when their final product is unsuccessful.

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Resources to Help You Provide Feedback on Makerspace Work

If you've never given feedback on the work students are doing in your makerspace, to do so might seem overwhelming. But there are many resources available that you can use as a model to customize your own rubrics. Below are some of the many Four C's rubrics available:

- PBLWorks (Buck Institute for Education)
- NewTechNetwork Rubrics
- EdLeader21 (note, there is a cost for these)
- Center for Innovation in Education
- Catalina Foothills School District Rubrics (based on Envision21 Rubrics)
- Related video: Assessing the Four Cs

At the Foundry, we created our rubrics by pulling from the examples above. These rubrics are not only helpful for teachers, but they are an incredible resource for students. For example, for students who may not have had many opportunities to collaborate before, the rubric will help them understand what makes a good collaborator. In many ways, the rubrics

create a pathway for students to progress in the areas of the Four Cs. Just as with other assessments, the rubrics help students and teachers identify areas of strength and areas for improvement.

For some projects, we focus on just one of the Four Cs. In other cases, we pull two or three areas from each of the Four Cs that we're really trying to focus on in that project. We want to ensure that the feedback we're providing to students is meaningful and relevant. We don't want the rubrics to turn into glorified checklists. Sometimes, we don't even grade. Yes, you read that right. **Sometimes we don't grade.** I think there is a misconception that assessment equals grades, but that doesn't have to be the case. You can absolutely provide feedback to students without assigning a grade.

Rubrics are also great tools for students to use in self-assessment. In student-directed makerspaces, it can be incredibly valuable for students to create a personal growth plan. They can self-identify areas and skills they wish to improve upon and use rubrics to track their progress.

Agency by Design, a project out of the Project Zero research group at Harvard Graduate School of Education, is another great resource. The group is exploring documentation and assessment strategies for maker-centered learning. High on my list of recommended reads for makers is their 2016 book, _Maker-Centered Learning: Empowering Young People to Shape Their Worlds_. The accompanying website has a wealth of resources and templates to use for measuring and documenting student learning in maker environments.

Every makerspace has a unique "why." If you aren't sure what your why is, I'd encourage you to check out my post 4 Strategies to Find Your Makerspace"Why." Once you have your why, it's important that you have a method of determining whether you're meeting the goals you set for your students and your makerspace. School is an apprenticeship program for life and work. And, just like any apprenticeship, learners need guidance, feedback, and support. Creating a formal feedback or assessment plan can help provide all of those things and ensure students get the most out of your makerspace.

Author

Heather Lister is an international speaker and author on the topics of makerspaces, school librarianship, and project-based learning. With credentials in school librarianship, mathematics, instructional technology, and school administration, Heather brings a unique and practical perspective to the world of maker education. Heather is the owner of Construct Learning and is currently serving as a senior maker fellow with the Foundry Makerspace in Harrisburg, Pennsylvania. Heather is the president-elect of the ISTE Librarians Network. Follow her @heathermlister or check out her blog at www.heatherlister.com.