

Conceptual Articles – Makerspace

Title of Article/Chapter	Extending the Reach of Academic Makerspaces into K-12 Schools: Delivering Maker-Based Instruction with a Mobile Makerspace
Source Title (journal, book, etc.)	ISAM Paper No. 4
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Participant Focus (teachers/students/etc.)	Teacher focused
Topic	As the title suggests, this article is about Maker-Based instruction and making it accessible in classrooms from grades K-12.
Main Findings	<p>This article talks about a new form of pedagogy known as the maker movement that is taking over education. The Makerspace Education concept promises to engage K-12 students in worthwhile learning. Sources of inspiration can be found in academic makerspaces that partner with universities. These makerspaces play a role in educating pre-service and in-service teachers. They foster an environment of learning and help these educators gain confidence in operating the tools and generating ideas for activities they will implement in their classrooms. These makerspaces are also open to other teachers that visit and learn about the space. The article also explains how one university developed a mobile makerspace unit that visits schools and make these spaces available to teachers and students everywhere.</p> <p>Now, what makes a lesson a makerspace lesson? The most important part of makerspace education lessons is making sure the lessons align with the goals and mindsets of the maker movement in order for students to meet the learning objectives. The maker mindset embraces risk-taking through creating, sharing, and solving problems in the world, all while learning</p>

academic objectives. This article discusses maker-based instruction, and the authors created a model for implementing maker education in the lesson designing process. This model is teacher-centered as the teacher will be setting expectations, maintain discipline, foster a sense of community, and drive instructional goals.

We cannot create engaging maker-based lessons without taking the theories of learning into consideration. This helps align the activities and lessons we create with valid and current instructional models, using the three principal theories of learning: constructivism, constructionism, and social constructivism.

In designing your lessons:

1. Sequence activities so that students can build their expertise in the subject.
2. Create opportunities for students to build on their prior knowledge in an organized way. Using scaffolding we help the learners build confidence and independence using skills to solve problems.
3. Push students to learn something

This maker-based project also focused on design principles used in the maker-based project:

1. Maker-based instruction is content agnostic.
Making doesn't have to be just STEM lessons. Students will benefit from lessons that are not centered around science, technology, engineering, and math.
2. Maker-based instruction is accessible to all students.
3. Maker-based instruction supports teaching effective and cognitive learning objectives.
4. Maker-based instruction is more than the sum of the tools found in a makerspace.

The article also explains different sprint cycles you can do during a lesson for activities students can work on inside of a makerspace classroom. Lesson examples include graphic design activities such as: designing and creating icons, designing logos, creating vector drawings used in vinyl cutting and activities such as designing a customized t-shirt. Each activity is detailed describing the steps of the exploration, the skill building and the challenge.

