

Cultivating Student Creativity

By Deanna Marie Lock

Creativity is as important a skill for students to learn as literacy, says British thought leader Sir Ken Robinson, and “we should treat it with the same status” in our schools¹.

That’s quite a bold statement—and yet, he’s not alone in his assessment.

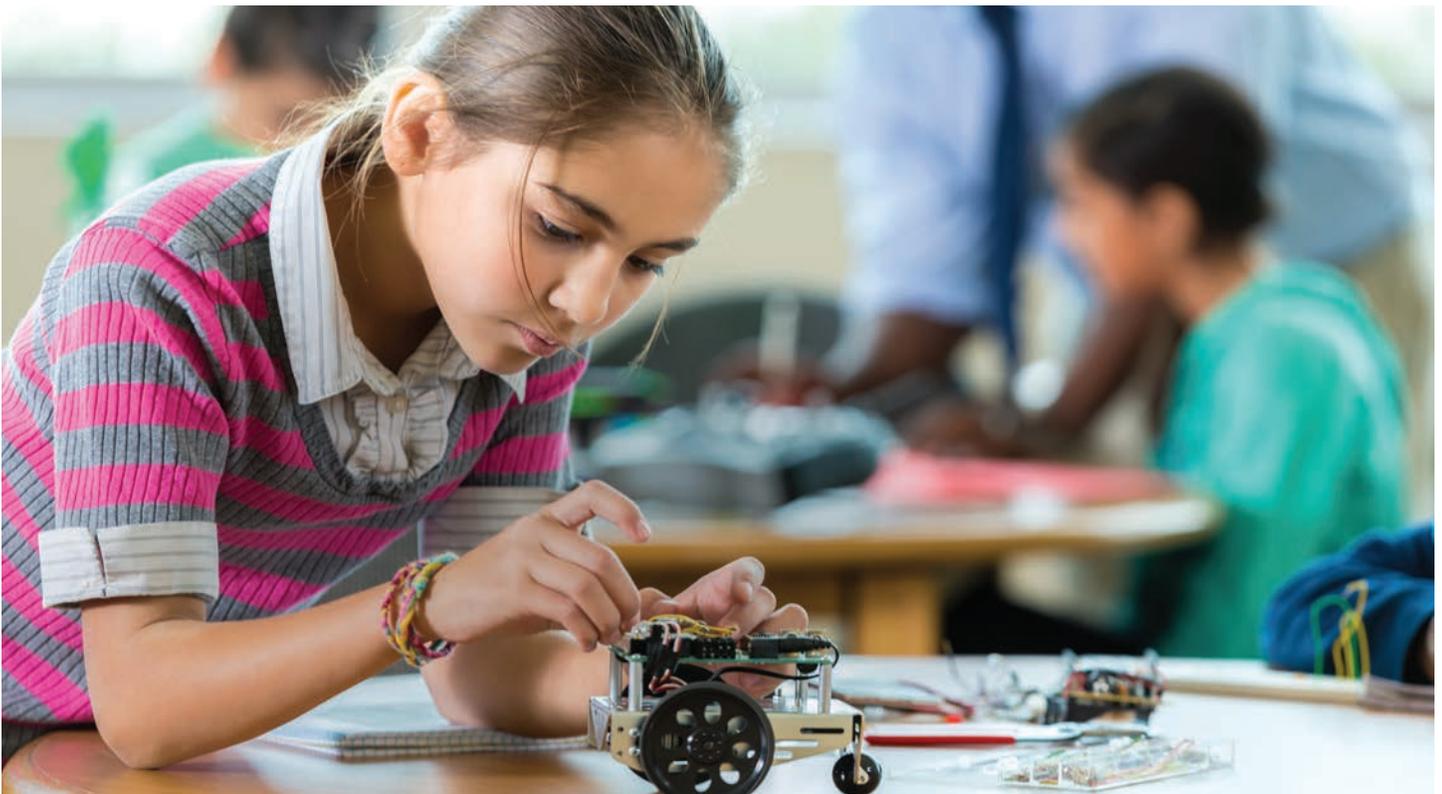
The ability to solve complex problems requires flexible, innovative thinking. As the world’s problems become increasingly complicated, workers who can think creatively are going to bring tremendous value to their organizations.

As a result, a growing number of educators are cultivating creativity among students of all ages by giving them opportunities to tinker, explore, design, and create. These opportunities are occurring

through hands-on projects assigned in either traditional classroom settings or makerspaces designed specifically for this task.

As it turns out, this constructivist approach to learning not only fosters student creativity; it’s a better way to learn core subject material as well. Having students become not just consumers of information, but creators of rich products that apply their new knowledge in innovative ways is the key to ensuring deeper learning.

Integrating this hands-on, constructivist approach can be daunting at first. Teachers and administrators will naturally have many questions as they begin.



UNDERSTANDING THE 'WHY'

Change of any kind can be challenging. It's human nature to continue doing what has always been done versus changing things up. Integrating creativity into instruction can be a change for some, while others naturally embed these opportunities. Teachers who have rarely given students opportunities to exercise their creativity need a clear and compelling reason to move beyond their comfort zone and transform their instructional practices.

The good news is that there are many strong reasons for cultivating student creativity, such as...

It's a more effective way for students to learn.

There are decades of research to support the idea that students learn best by doing, and not by simply talking or reading about a concept.

In one study from 2015, researchers from the University of Chicago found that students who

physically experience scientific concepts understand them more deeply and perform better on tests. Brain scans indicated that college physics students who took a hands-on approach to learning about concepts such as angular momentum and torque activated the sensory and motor-related parts of their brain when they later thought about these concepts—and activation of these areas of the brain was associated with better assessment results.²

Having students make something is a great way to apply hands-on learning. Asking students to build their own catapult, for example, can help them understand the concepts underlying simple machines much more effectively than if they see a picture in a textbook. Better yet, challenge students to design a device that can hurl an object of a specified weight a certain distance—or to design the most accurate catapult they can.



As students work through the creative design process, they'll come to grasp key concepts surrounding force and energy and will retain these concepts much longer.



It helps reach all students, including those who are traditionally underserved.

Encouraging students to be creative gives them the opportunity to take ownership over their learning, which is a great way to get them more invested in their education. This is true for all students, but especially those who struggle to be successful in traditional educational environments. Exploring their creativity gives shy students a chance to excel. It allows students who struggle with academics to showcase their thought process in a different manner, and it helps students with disciplinary problems better regulate their emotions.

Want proof? Researchers from MIT and Pepperdine University created a “Learning Lab” makerspace inside a residential juvenile detention center, in which incarcerated teens could engage in self-directed projects. Many students discovered untapped potential they never knew they had—

and in four years of the program, there were no incidents of violence or destruction. By contrast, the center’s traditional school averaged one such incident a day.³

Today’s employers demand it.

Creativity is a skill that employers increasingly desire. According to the World Economic Forum’s “Future of Jobs 2018” report, creativity was the fifth most important skill for employees to have in 2018—but it is expected to climb to third most important by 2022.⁴

Workers who think creatively can streamline processes, invent new products, design enhancements to existing products, and imagine new markets or business opportunities—all activities that businesses need to succeed. These workers are also adept at solving complex problems, which is an important skill regardless of the career path that students choose.

THREE KEYS TO INSPIRING STUDENT CREATIVITY

Cultivating creativity is something that teachers in all subject areas and grade levels can do. Here are the three basic elements you'll need to get started.

Tools and materials

For students to become creators and innovators, they need raw materials to work with and tools to bring their vision to life. These items can be as simple as construction paper, scissors, and glue—or as complex as 3D printers, electronics kits, sound mixing boards, and other technologies.

The tools and materials you choose should depend on what you'd like students to learn, as well as what kind of resources you have at your disposal. Materials that may be included in a makerspace are:

- Equipment such as laptops, tablets, monitors, and 3D printers.
- Materials to create with, such as paint, paper, cardboard, plastics, fabrics, wood, and metals.
- Tools for cutting and joining together materials, such as scissors, wire cutters, wire, glue guns, soldering irons, and hand tools.
- Electronics kits for building simple circuits, machines, computers, and robotics.
- Digital media production tools such as cameras, green screens, video editing software, music keyboards, turntables, and composition software.

Some of these tools and materials can be costly. Adopting a constructivist approach to learning doesn't have to be expensive. You can lead powerful learning experiences without spending a lot of money by beginning simply, using items that are readily available to you—and then adding new materials as you're able.

Developing Learning Projects

While unstructured tinkering and exploration works well within informal learning spaces, classroom teachers will want to develop projects that align with their specific learning goals.

This starts with thinking about what new knowledge you want students to learn, as well as what additional skills you'd like them to apply during the creative

process—such as collaborative problem solving. Think about how you'll measure success as well, and make sure you clearly communicate this to students through the creation of project rubrics.

As you're developing projects for students to tackle, you might want to keep in mind the seven elements of PBLWorks' Gold Standard for Project-Based Learning.⁵ These are...



- **A challenging problem or question:** The project is framed by a meaningful problem to be solved or a question to answer, at an age-appropriate level of challenge.
- **Sustained inquiry:** As they complete the project, students engage in a rigorous, extended process of posing questions, finding resources, and applying information.
- **Authenticity:** The project involves real-world context, tasks and tools, quality standards, or impact, or it speaks to personal concerns, interests, and issues in the students' lives.
- **Student voice and choice:** Students are able to make some decisions about the project, including how they work and what they create.
- **Reflection:** Students and teachers reflect on the learning, the effectiveness of project activities, the quality of student work, obstacles that arise, and strategies for overcoming them.
- **Critique and revision:** Students give, receive, and apply feedback to improve their process and products.
- **A public product:** Students make their work public by explaining, displaying, and/or presenting it to audiences beyond the classroom.



Culture

Just as important to fostering creativity as the tools that students use and the activities they work on is the culture that teachers establish.

For students to be creative, they need an environment in which it's safe to fail. They need to learn that failure is simply another step on the journey toward deeper understanding. Projects should be interactive in nature, with students having a chance to try different approaches, and if these don't work, reflect on why and then try again.

"In my eight grade Physical Computing course, students all begin with an idea of an invention that they want to build, but they have no idea how they will build it," writes Trevor Shaw, director of technology for the Dwight-Englewood School in New Jersey⁶. "Each decision in the design process involves a leap of faith as they learn how to work with unfamiliar materials and tools using an untested, original design. Occasionally, despite careful planning, students realize halfway through a project that their original design isn't going to work, and they need to go back to square one."

Teachers can create an environment in which it's safe to fail by building a culture of risk-taking. For this to occur, they must be very intentional in doing so.

"We need to be mindful of the fact that risk-taking is an unnatural act in most classrooms," Shaw writes. "Unless we take explicit steps to create a classroom culture that fosters risk-taking, it will not happen organically. This means talking openly about risk taking, encouraging it, and praising it publicly when we see it in our students. It also means providing some opportunities for students to pursue personalized learning goals without being penalized for departing from teacher-defined outcomes."

HOW TO MAKE EVERY CLASSROOM A MAKERSPACE

One trend that's catching on is the construction of a separate makerspace in schools, where teachers can bring their students to engage in hands-on, creative projects. This might be a section of the library, or a converted computer lab, or even a spare classroom that's equipped with tools and materials to support student design and creation.

You don't need a separate, dedicated space to foster creativity. In fact, every classroom can become a makerspace with the right attitude and a little ingenuity.

There are five key elements of learning space design that can transform any school space into a makerspace.



THE FIVE KEY ELEMENTS OF SPACE DESIGN WHEN CREATING A MAKERSPACE

Furnishings and decorations that inspire creativity

The traditional classroom setup, with neat rows of desks facing the front of the room, does little to inspire creativity. In fact, it sends a counterproductive message: Students should be quiet, stay in their seats, and listen to the teacher talk.

On the other hand, imagine the message that students get when they walk into a room with many kinds of learning zones, colors, and seating options—regular chairs, soft seating, and even some bouncy seats: “We’re going to do things a little differently here, and you’re invited to take part and have some fun as you learn.”

As we mentioned, culture is a key aspect in cultivating creativity—and the design of the learning space contributes to the culture that exists there. Teachers can help spark creativity among students by giving them choices in where they will sit and work, and by creating a vibrant and visually stimulating environment. Include posters, manipulatives, and other items that get students thinking and challenge their perceptions; just don’t go overboard in decorating the room, as too much stimulation can actually do more harm than good.

Movable, flexible furniture that can be used for a variety of purposes

Modular furniture that can easily be moved around the room allows teachers and students to create

flexible seating arrangements to support project-based learning. For instance, seating can be arranged to face the front of the room for whole group instruction and then quickly rearranged into small groups for collaborative projects.

What’s more, furniture that serves multiple purposes allows teachers and students to maximize the possibilities of limited spaces for learning.

When Northwest Middle School in Greenville, S.C., remodeled an area of its library to create a makerspace, officials included a Lego wall so that students could build Lego designs on the wall—and the surfaces of bookshelves are used to give students more space for working and also for displaying student creations.⁷

Spaces for students to collaborate and brainstorm ideas

Students don’t just need room to work on their creations; they need space to plan as well. They need opportunities to research, think, and sketch out their ideas—either alone or in partnership with others. Creating a separate zone for ideation that is equipped with digital devices, whiteboards, and/or paper and pencils can help support this activity.

You might consider adding soft seating options to this area as well, because students are apt to be most creative when they are feeling at home in their surroundings. Soft seating options can make the space comfortable and inviting for students to huddle together, brainstorm, and bounce ideas off each other.



Places to store tools and materials

Pay attention to your storage needs. There should be plenty of shelf or cabinet space to store equipment safely. Make sure materials are easy to find and are clearly labeled. Dangerous materials should be stored in locked cabinets or high up where young children can't reach. Pay attention to your storage needs. There should be plenty of shelf or cabinet space to store equipment safely. Make sure materials are easy to find and are clearly labeled. Dangerous materials should be stored in locked cabinets or high up where young children can't reach.

Features that ensure student safety

Above all, a makerspace should be a safe place for students to work. The space should be well lit, ventilated, and equipped with a first aid kit and a fire extinguisher. There should be adequate surface space for students to spread out materials and use tools safely. Keep all pathways to exits clear, and make sure

students clean up to keep the space free from clutter. All procedures and instructions for using tools and equipment should be clearly posted, and students should learn how to safely use all tools as they're introduced.

SHORT ON SPACE? NO PROBLEM...

Any classroom can be a makerspace, even if you're short on actual space. If your classrooms aren't big enough to comfortably store tools and materials for student projects, consider investing in a mobile makerspace solution. You can purchase or outfit mobile carts with tools and supplies for all kinds of activities, then wheel them out as needed and store them away in a closet when they're not in use.

Carts can be set up with various themes: an art supplies cart, an electronics cart, and so on. This is also a great solution if you lack the budget for your own supplies. A mobile makerspace cart can be shared among several classrooms as needed and stored in a central location between uses.



IDEAS FOR INSPIRATION

Integrating creativity into your instructional program through hands-on projects and makerspaces can be as simple or elaborate as you desire. Focus on your end goal and how you want to impact instruction. Incremental changes in your environment, instruction, and culture will allow you to succeed.

For more insights into how to create a successful makerspace, check out these free resources from

School Specialty:

<https://www.schoolspecialty.com/makerspace>

To learn how School Specialty's Projects By Design division can help you design engaging and effective learning spaces that help cultivate student creativity, call **(800) 305-0174**, email projectsbydesign@schoolspecialty.com, or go to www.schoolspecialty.com/projects-by-design.

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