



As district administrators finalize their summer recovery plans to mitigate the effects of COVID-19 learning loss, the challenges of providing effective summer programming can be a lot to handle.

While providing summer programming is a common practice for many school districts across the country, this year, there are significantly more variables to consider. From the uncertainty of how COVID-19 will impact in-person programming, to the desire to engage teaching staff and offer opportunities that wake children up from the “Zoom fatigue”¹ they may have experienced through the academic year, school officials are looking for programs that simplify the planning process.

In addition to state, Common Core and Next Generation Science Standards alignment, educators want to offer programs that revive their students’ natural curiosity and help them reengage with their world.

The Power of Informal Education

In response to the need for safe and socially distanced learning environments, many schools have been limited in their ability to provide the type of hands-on experiences that give essential context² to what students are learning.

This is especially important for engaging in STEM (science, technology, engineering and mathematics) subjects, as concepts within these areas of study can sometimes feel abstract or disconnected from everyday experience.



Taking a closer look at a robotic cricket, two Camp Invention participants discover the power of solar cells.

Informal education,³ or learning that takes place outside of a traditional school setting, can address this challenge by inviting students to explore in ways that naturally align with their interests. As this type of knowledge acquisition is self-directed by nature, it can positively transform an individual’s attitude toward learning.

Peter Johnston, professor emeritus at the University of Albany, describes this phenomenon in his book, “Choice Words: How Our Language Affects Children’s Learning,” and explains that we often learn best in settings that allow us to figure out the answers on our own.

When you figure something out for yourself, there is a certain thrill in the figuring. After a few successful experiences, you might start to think that figuring things out is something that you actually can do. Maybe you are even a figuring out kind of person, encouraging an agentic dimension to identity. When you are told what to do, particularly without asking, it feels different. Being told explicitly what to do and how to do it – over and over again – provides the foundation for a different set of feelings about what you can do and can’t do, and who you are. The interpretation might be that you are the kind of person who cannot figure things out for yourself.⁴

In other words, overcoming a challenge using our own problem-solving abilities is contagious. The boost in confidence we feel originates from the realization that we are often more capable than we had previously believed. Informal education programs that create safe and supportive spaces for this type of active learning to occur have the power to develop a child’s confidence from an early age.

A study published in the Journal of STEM Education supports this and found that students attending a STEM-based informal learning program received additional benefits including confidence, informal mentoring, camaraderie, exposure to new opportunities, feelings of accomplishment and the chance to apply math and science in more tangible ways.⁵

Embracing Play Through Invention Education

Informal education has the additional benefit of giving children the opportunity to play — an essential aspect of early child development. According to Mayra Mendez, a licensed psychotherapist and program coordinator at Providence Saint John’s Child and Family Development Center in Santa Monica, California, the act of play represents a primary way children begin to understand the world around them.

1. Walker, T. (2020, October 16). *How ‘Zoom Fatigue’ Impacts Communication with Students*. <https://www.nea.org/advocating-for-change/new-from-nea/how-zoom-fatigue-impacts-communication-students>

2. O. Ekwueme, C., E. Ekon, E., & C. Ezenwa-Nebife, D. (2015). The Impact of Hands-On-Approach on Student Academic Performance in Basic Science and Mathematics. *Higher Education Studies*, 5(6), 47. <https://doi.org/10.5539/hes.v5n6p47>

3. Infed. (2019, October 19). *Informal Learning: Theory, Practice and Experience*. [infed.org](https://infed.org/informal-learning-theory-practice-and-experience/). <https://infed.org/informal-learning-theory-practice-and-experience/>

4. Johnston, P. H. (2004). *Choice Words: How Our Language Affects Children’s Learning*. Stenhouse Publishers.

5. Denson, C. D., Hailey, C., Stallworth, C. A., & Householder, D. L. (2015). Benefits of Informal Learning Environments: A Focused Examination of STEM-based Program Environments. *Journal of STEM Education*, 16(1).

“Play is important because it provides a primary foundation for learning, exploring, problem-solving and building an understanding of the world and your role within it,” Mendez said in an article published in Healthline. “Young children learn how things fit together through play. It allows them to use their senses and encourages exploration and curiosity, and these are the foundation of intellectual development and cognitive processing.”⁶

Invention education, learning through the act of discovering or “inventing” solutions to real-world problems, authentically blends play with 21st-century skill development.⁷ In this context, students are free to take risks and explore because the learning environment embraces creativity and innovation.

When it comes to helping close the gender⁸ and diversity⁹ gaps present in our current STEM workforce, early exposure to these subjects in unthreatening ways is essential. Hands-on activities that introduce technical concepts can transform a student’s attitude¹⁰ toward topics they might not have found appealing in a traditional school environment. Paired with findings from Opportunity Insights that link early experience with innovation to the likelihood to innovate into adulthood, it’s clear that invention education provides unique advantages when incorporated into informal learning environments.

Simplify Your Summer Recovery Planning

For over 30 years, Camp Invention® has inspired millions of children nationwide through hands-on STEM activities that embrace open-ended exploration.

Aligned to state, Common Core and Next Generation Science Standards, Camp Invention’s program provides everything educators need for turnkey implementation — from step-by-step curriculum guides and interactive videos to an all-inclusive set of materials.

Designed to run both in person and at home, Camp Invention is also customizable and can adapt to each district’s specific needs.

[Visit our website](#) to learn how Camp Invention can recharge your summer programming today.



A Camp Invention participant takes apart a wireless microphone to explore its inner workings.



How One Educator Established a STEM Pipeline Using Camp Invention

In a recent webinar hosted by the National Inventors Hall of Fame® and focused on reenergizing teaching and learning, Christine Girtain, director of authentic science research at Toms River

High School in New Jersey, spoke to those in attendance about how she uses Camp Invention® and Club Invention® to help younger students build an interest in STEM subjects.

“I’ve tried to develop what I call a ‘STEM pipeline’ so I can engage students at an elementary level that I feed into summer experiences I teach for middle school students,” Girtain said. “Eventually, those students can feed into my research class.”

Girtain, who teaches an advanced science course at the high school level, was initially concerned that COVID-19 would impact the STEM pipeline she had spent years cultivating. Thankfully, last summer Camp Invention offered an at-home solution, and she was able to secure funding to offer the program at three socioeconomically underserved schools nearby to provide STEM education for the summer.

While describing just how much students enjoyed Camp Invention, Girtain told a story about how the program enabled one of her colleagues to reengage a student who had “checked out” during the academic year.

This student “hadn’t logged on to speak or do any of the work for the end of the school year,” but the Camp Invention instructor took a chance and sent the camp materials to his house. “He logged on and was engaged the whole time,” Girtain said.

As she continues to prepare for this summer, Girtain plans to use CARES Act funding to bring more Club Invention and Camp Invention programs to her district.

“The really touching moments for me were when they made those connections and the excitement they had about the materials that they were engaged with, and how they wanted to meet even more times — they were sad when it ended,” Girtain said.

- Zapata, K. The Importance of Play: *How Kids Learn by Having Fun*. Healthline. <https://www.healthline.com/health/the-importance-of-play>
- The National Inventors Hall of Fame. *How NIHF Embraces Authentic Invention Education*. National Inventors Hall of Fame®. <https://www.invent.org/blog/trends-stem/21st-century-skills-students>
- Denson, C. D., Hailey, C., Stallworth, C. A., & Householder, D. L. (2015). Benefits of Informal Learning Environments: A Focused Examination of STEM-based Program Environments. *Journal of STEM Education*, 16(1).
- Hrabowski, F. A., & Henderson, P. H. (2019, November 29). *How to Actually Promote Diversity in STEM*. The Atlantic. <https://www.theatlantic.com/ideas/archive/2019/11/how-umbc-got-minority-students-stick-stem/602635/>
- Denson, C. D., Hailey, C., Stallworth, C. A., & Householder, D. L. (2015). Benefits of Informal Learning Environments: A Focused Examination of STEM-based Program Environments. *Journal of STEM Education*, 16(1).