

Girls, STEM, and Digital Equity in the Maker Movement

The maker movement has great potential to change the future of STEM careers, particularly for girls. However, a focus on digital equity is required to ensure that all students have the opportunity to take part.

The maker movement refers to the recent wave of tech-inspired, do-it-yourself innovation sweeping the globe. Participants in this movement, known as makers, take advantage of increasingly affordable, powerful, easy-to-use tools, as well as access to knowledge, capital, and markets to create new physical objects. This revolutionary change in how hardware is innovated and manufactured has great potential to **change the future of computing**, particularly for girls and women, a group traditionally underrepresented in Science, Technology, Engineering, and Math (STEM) fields.

“In recent years there has been a surge of energy around the need for young people to become not only consumers of technology, but also builders and creators. Unfortunately, many groups are underrepresented in the maker movement due to a lack of access, digital devices, and connectivity.”

The Current State of the Maker Movement

Edsurge joins the many, many makers in discovering that it has never been easier to hop on board the maker movement. Constant connectivity allows for makers to collaborate, remix, and share ideas. This online community of makers, and the ability to tap into different skill sets and knowledge levels, has become as valuable as the tools and components themselves.

Additionally, classroom environments have evolved to embrace the type of mindset required to participate in making. Project-based learning has gained traction in schools as an alternative to the traditional lecture-based instructional approach. Educators are rethinking their teaching methods to better help students develop 21st century skills, like critical thinking and problem-solving. Today there are more makerspaces in schools, and more teachers willing to become part of this community.



Exploring Equity in Making

While there is growing interest worldwide in the maker movement, many groups—especially those that fall into the digital divide—lack the devices, access, and connectivity required to participate.

On a panel, “[Equity in Making and Creating with Technology](#),” organized by the Stanford Graduate School of Education, researchers and practitioners explored the importance of broadening access to technology and connectivity in order to include underrepresented groups in the maker movement. The panel discussed the current state of the movement as they see it, and offered several insights for addressing issues of equity:

- **Equity and diversity will not happen by accident.** Including underrepresented groups in the maker movement is not something that will happen naturally. Educators and those working to bridge the digital divide should be intentional in creating opportunities, so that minorities and low-income students feel a sense of belonging and access to these
- **Maker should not be a nice-to-have activity in impoverished schools.** It is a common perception that schools in impoverished areas should focus on providing the basics for students, and offer the “cool stuff”, such as technology-based maker activities, only if possible. The panel argues that, on the contrary, students from underrepresented groups need more digital access, more incentives, and more opportunities to discover their passions through making.
- **Projects should not be limited to classrooms.** The collaborative, hands-on nature of making provides an opportunity to blend maker opportunities with real-life activities. Making should be a way to involve families and the greater community through participation and neighborhood partnerships. Digital equity can help level the playing field by increasing access outside of the classroom walls.

Growing popularity

A recent survey by [Harris Poll](#) reveals the growing popularity of the maker movement, and underscores the importance of digital equity in making these opportunities available to more groups of students.



1 in 4

surveyed youth has made things with technology during the past year



7 in 10

would like to learn to make something with electronics

- Youth makers are more likely than other young people to describe themselves as **independent, hardworking, solution oriented, and social**
- Nearly all parents surveyed believe that getting both girls and boys involved with making and creating things with electronic tools is a great way to **build interest and skills in STEM**, essential in building skills for a future career

Why It Matters

Enabling underrepresented groups, such as those that fall into the digital divide, to fully participate in the maker movement has important economic benefits. A recent report by [Intel](#) found that participation in maker and STEM activities can help young people develop career-ready skills and improve their earning potential. As a result, the STEM talent pool expands, fueling competition and innovation, and ultimately strengthening the global economy.

Additionally, since making is based on what is personally relevant to an individual, it allows people of all backgrounds to pursue their interests and to use their technological tools to develop their own projects. It can create more channels for girls to positively identify with computer science and engineering fields, where they historically have been underrepresented.

Making enables those who may not be naturally tech-oriented to discover how technology and computing skills can help them achieve goals. As digital technologies affect almost every aspect of modern life and business, it becomes even more important to address digital inequities that may be limiting students' access to these types of learning opportunities.

Taking Action

While the maker movement is gaining excitement and momentum, action is needed to increase diversity in making. Broadening participation in making is good for all, but especially for those groups that are historically underrepresented in STEM fields. By identifying and addressing issues of digital equity, we increase the size and diversity of people for STEM career pipelines.

Voices From The Field

Hear what Victoria Thompson, STEM Integration Transformation Coach at [Technology Access Foundation](#), has to say about digital equity and the role it plays in the maker movement.



When digital equity is addressed, how do you envision the maker movement transforming education, particularly in STEM fields?

The maker movement can provide opportunity, but we have to address the *why*—and the *why* is always the students. We have to ask ourselves, what is the purpose? How are students authentically responding to this task? Making must have a real-world connection. At the core of the experience, it should always be student-driven and student-centered.

View Additional Resources

Check out the rest of the Digital Equity tools and resources on the [K-12 Blueprint](#).