

the state of maker learning in southwestern pennsylvania

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introduction



As a steel town with a legacy as a manufacturing hub, Pittsburgh has long been a place where things are made. Today, that legacy continues as the region has established itself as a hub for the maker movement, a growing international community of DIYers, professionals, hobbyists, and students who use technology, tools, and materials to create new things.

For years, these words have been positioned atop Remake Learning's Maker Learning Collaborative landing page (remakelearning.org/maker). Making is part of the fabric of Southwestern Pennsylvania. From its place at the center of the steel industry to a burgeoning technology epicenter, maker learning has always been at the core of Remake Learning's work. Remake Learning is a free peer network for educators and innovators in the greater Pittsburgh region. The network helps connect people, projects, and organizations, making it easier for them to share best practices, collaborate on new ideas, and find funding and professional learning focused on engaging, relevant, and equitable learning.

In 2015's *Remake Learning Playbook* (playbook.remakelearning.org), Gregg Behr and Dr. Lynne Schrum wrote that "[t]hese approaches are not just passing fads in education; they are the key to building engaging and relevant learning experiences that prepare today's youth for school, college, workforce, and life."

Just one year later, President Obama proclaimed a renewed commitment to what many consider the hallmarks of American society: ingenuity, creativity, and technological innovation (bit.ly/nationofmakers). The "Nation of Makers" initiative saw the launch of the National Week of Making and an acknowledgment that many citizens—particularly those from historically under-resourced communities—have not had equitable access to the technologies, mentors, and funds that making requires.

With the recent celebration of Remake Learning's 15th anniversary, we also celebrate the work that has been done to sustain and grow maker learning offerings throughout the region. Over the last 15 years, communities, schools, and out-of-school time organizations have built out makerspaces, integrated and implemented maker learning curricula, and worked to truly remake learning through authentic, hands-on, design-focused learning experiences. The maker learning ecosystem that has emerged as a result serves as a shining example of this network's power.


Much has changed in the landscape of education and maker learning since our working group first came together. To build upon the progress we've made, the Maker Learning Collaborative must continually assess the state of maker learning and how it serves the region. To that end, in June 2020, a steering committee of maker advocates and educators began convening with the goal of better understanding the region's maker learning ecosystem, identifying the Collaborative's values, and revising the working group's vision.

setting the stage

With the COVID-19 pandemic simultaneously exacerbating existing societal inequities and creating new ones, the steering committee knew equity of access and opportunity needed to be at the forefront of the Collaborative's work. To instill this focus, the steering committee established the following values:




**Authentic,
transdisciplinary
project-based learning**



**Culturally responsive,
anti-racist opportunities
and spaces**



**Cultivating identity,
ownership, and
responsibility**



**Hands-on learning
with real materials
and tools**



**Promoting discovery
and iterative design**

steering committee members

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With these values in mind, the steering committee established the Maker Learning Collaborative's vision for the future of maker learning:

**robust, accessible
maker opportunities
in every community,
which empower
people to pursue
creative pathways and
positively impact their
own lives and the
broader community**

what is the state of maker learning in southwestern pennsylvania?

To build on the steering committee's work, the Maker Learning Collaborative, in partnership with Digital Promise and with the support of The Grable Foundation, set out to better understand the state of maker learning in the region using its updated vision and values as a guide. Of the utmost importance was hearing directly from stakeholders in K-12, higher education, industry, and the community to offer their perspectives and experiences with maker learning in Southwestern Pennsylvania. Through online surveys, interviews, collaborative work, and data analysis sessions, the Collaborative identified the following trends that inform the state of maker learning in Southwestern Pennsylvania.

broad definitions: weaving the maker learning story

As a working group, the Maker Learning Collaborative has defined “maker learning” as the following:

Combines hands-on problem solving with interdisciplinary learning

Develops curiosity and confidence

Makes the world's tools and materials more visible and accessible

To begin understanding the state of maker learning in the region, it is critical to understand how *stakeholders* are defining making and maker learning. Educators and advocates in the region shared their definitions of maker learning and the working group identified points of consensus as well as different interpretations. Consistent trends across this dataset highlight that stakeholders' definitions emphasize process over product, the importance of creativity and exploration, and the duality of “making to learn” and “learning to make.”

While stakeholders' definitions of maker learning have many consistencies among them, they are also varied and complex. Where the definitions differ from one another serves as a reminder that making can be—and should be—deeply personal. For example, a number of responses emphasize maker learning's connections with math and the sciences, while others specifically call out the beauty of the arts and personal expression. While “process over product” is clearly an important driver and characteristic of maker learning, some stakeholders place an emphasis on thinking routines and the design process, while others speak more to technical processes and skills development. As the Maker Learning Collaborative evolves alongside our ecosystem, the working group must take these differences into consideration to ensure an impactful, inclusive network.

programmatic priorities

With such a wide range of definitions of maker learning, it comes as no surprise that there are a number of driving forces behind what educators prioritize in their maker learning facilitation. Skills development ranks as the greatest priority for maker educators, with 66% of respondents indicating it as one of their top three priorities, ensuring learners are growing their array of design-thinking strategies, problem-solving skills, and more.

Meanwhile, 51% of educators surveyed prioritized learners acquiring a better understanding of and ability to use maker tools and technologies. At just under half of the educators surveyed, interdisciplinary learning is a priority for 46% of educators.

While 36% of educators indicated knowledge acquisition related to core content standards as a priority, it is clear that educators see making itself as a valuable practice outside of traditional academia: 41% of respondents cited exploration of identity as a driving force behind their maker learning work.

making all over, but limited capacity

The stakeholders we surveyed are creating maker learning opportunities in many places: across grade bands and content areas, and in both in-school and out-of-school environments. 44% of survey respondents indicated that they are integrating maker learning directly into core content areas. However, the greatest percentage of educators, 67%, reported that maker learning happens outside of the school day. This data, coupled with the additional context that 62% of those surveyed cite “capacity” as one of their greatest challenges in implementing maker learning, highlights that maker learning is happening at significant levels, but that it is not happening everywhere and its implementation still has numerous challenges. Most frequently cited were issues of time, alignment with other priorities, availability of tools and resources, and stakeholders’ perception of their maker learning facilitation.

greater community collaboration

No one organization can ensure maker learning access for all learners in the community. Productive partnerships between K-12 schools, higher education institutions, out-of-school time organizations, and industry strengthen the entire maker learning ecosystem. A cross-sector network of organizations creates touchpoints and collaboration opportunities to ensure learners can engage in maker learning anytime, anywhere. 92% of K-12 educators who responded to the survey indicated that they plan to continue or begin collaborating with community partners in their maker learning endeavors.

the next 15 years: how we can support maker educators

Guided by an updated set of values and a vision rooted in equity, creativity, and self-discovery, the Maker Learning Collaborative is positioned to remake itself to better support stakeholders in creating, sustaining, and growing maker learning opportunities for all learners in Southwestern Pennsylvania. Below are some of the ways in which the working group recommends engaging and supporting its stakeholders.

coordinate and convene within and beyond the working group

Launch collaborative affinity groups

The varied definitions of maker learning in the region demonstrate a need for the Maker Learning Collaborative to meet its stakeholders where they are, and support their maker learning efforts, no matter their desired outcomes. The creation and formalization of **maker learning affinity groups** within the Maker Learning Collaborative would allow stakeholders to connect and collaborate with those who are working towards the same goals within the network.

But they should not work solely within these silos. With so much crossover among the different maker learning focus areas, affinity groups should strategically partner with one another, lending their passions and domain area expertise to those in other affinity groups.

Connect across working groups

The working group should also seek to foster stronger connections across Remake Learning's other working groups: CSforPGH, the Personalized Learning Working Group, and the Pittsburgh Regional STE(A)M Ecosystem. There is ample opportunity to highlight and build upon the connections between maker learning and each of these groups' focus areas.

Engage national (and international) partners

Remake Learning has a strong global presence, and tapping into the power of our international connections would bring new opportunities and growth to the region's maker learning work. Partnering with organizations in the realm of education, as well as industry partners with a vested interest in maker learning, would allow the Maker Learning Collaborative to connect maker educators and their learners to the global maker learning community.



catalyze, communicate, and champion resources and opportunities

Explore new communication strategies

With the success of our social media takeovers and the piloting of a Discord server for maker educators, the Maker Learning Collaborative is working to meet stakeholders in the virtual and physical communities in which they participate. In these spaces, we should share powerful stories, impactful resources, and promising opportunities.

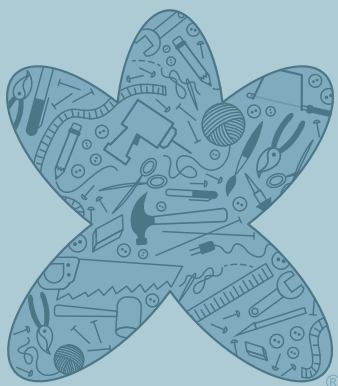
Support affinity group outputs

The aforementioned Maker Learning Collaborative affinity groups should each identify problems of practice for their focus areas and work to collaboratively develop resources and supports to further their goals. With their own stated outcomes, meetings, and supports, the maker learning affinity groups should each drive forward their respective area of focus.

Provide catalytic funding and support

When possible, the Maker Learning Collaborative should also offer catalytic funding to maker educators and organizations to develop new and effective resources and supports for the region's stakeholders, as well as those around the world.

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