After reading the title you may think that Pennsylvanians, or at least the writers of this article, have a fixation on alliteration! Prefiguration translates to a future imagined by a group, and the authors think that makerspaces can play a part in that future. The reality is that we believe there is a lot career and technical education (CTE) can learn from the Maker Movement, and that there is equally as much the Maker Movement can learn from CTE.

This article starts at the 10,000-foot level and descends to the ground level with two examples that bookend the state of Pennsylvania. Though each bookend focuses on a different part of the state, both work with secondary students, are scalable and have the potential to provide benefits to everyone involved!

Let’s start by taking a look at some conceptual underpinnings of makerspaces and how they work with these two populations.

Arboriculture, avionics, finance management, graphic design, mechatronics, radiology and wind turbine technology are all familiar pathways that are accessible through CTE, but what else do these pathways have in common? As those of us who work in this community know, CTE as an education methodology is a way to combine theoretical knowledge, applied practical skills and a desire to be one’s best. That combination results in individuals who are technically competent and confident, and who contribute to maintaining our standard of living.

But how do these individuals develop an interest in these pathways? Did they become interested because of a family member? Was it a friend, a counselor or an encouraging teacher who opened their eyes to these pathways? Of course, the answer will vary by individual. Many of today’s discussions in educational circles focus on providing options for all students to learn a variety of pathways, with the goal of individuals having the opportunity to find their own passion. Passion and interest-driven learning through production-centered projects are hallmarks of the types of work that can happen in makerspaces. Youth-serving makerspaces are physical settings located in different educational spaces, such as after-school centers, schools, libraries and museums that offer hands-on digital and tangible activities and programs for youth. The equipment of makerspaces ranges from sewing machines for designing items of clothing and circuitry toolkits for making interactive prototypes, to 3D printers and laser cutters for creating small models and larger projects. Youth-serving makerspaces in the United States offer an equally diverse array of activities, including the design and construction of full-sized dog houses that youth hope to sell, or the creation of a collaborative project.
In conjunction with the White House Maker Faire of two.oldstyle/zero.oldstyle/one.oldstyle/four.oldstyle, Chevron made decisions later on. Equally important is the digital on-ramps to core 21st-century competencies.

The Labs has recently received a small mini-grant from the Sprout Fund to support the creation of digital badges via the lbns platform. The digital badge initiative includes areas such as design, photography, inventing and sewing. NCTE (mandatory for Pennsylvania CTY students) maintains a SkillBadge Locker that houses student end-of-program competencies. Both programs are designed on open-source platforms and are capable of importing and exporting. As students progress on their pathway, these badges could potentially be displayed on both sites, thus showing a student’s growth in knowledge and skills over time.

The Eastern Example
Philadelphia has a diverse Maker arena that is continuing to grow. Local organizations such as NextFab, Public Workshop, The Hacktory and Maker Jawn are all vibrant programs where students—both young and old—can learn skills such as fabrication, design concepts, electronics, art, carpentry and technology. Over the past several years, funding from the Knight Foundation, the Barra Foundation and others has supported the growth and success of the Maker Movement in Philadelphia. These public-facing Maker groups have expanded and collaborated over the past few years. In 2013, NextFab, Public Workshop and The Hacktory created common space in West Philadelphia known as The Department of Making + Doing. The Maker Jawn program grew out of the Free Library of Philadelphia’s central branch in 2011, and it now offers programming at five branches across the city. The opportunities for youth to create and develop interests via the Maker Movement in Philadelphia are wide open. Programs like Public Workshop and its spin-off, Tiny WPA, have had particular success in working directly with schools and connecting with students based on both their interests and needs.

Although students in Maker programs are directly learning many of the technical, project management and collaboration skills involved with CTY programs, a direct connection to the school district of Philadelphia’s successful CTY programming appears to be missing. Philadelphia boasts a graduation rate of more than 90 percent from its CTY programs, compared to the 70 percent overall graduation rate. Connecting the learning from Maker programs with career-oriented CTY programming could help drive more students toward their career interests and postsecondary opportunities.

Conclusion
Both ends of the state of Pennsylvania are reflective of the potential and relative ‘newness’ of the Maker Movement. The authors believe that connecting maker spaces to CTY programming could yield compelling results through the sharing of facilities, the creation of engaging experiences for youth and the multitude of opportunities for students to pursue their passions. We also believe that by engaging community resources and concepts such as mobile labs, programs have increased opportunities to scale effectively.

We hope this article piques your interest and that it offers a springboard to begin dialogue in your state or region, putting you on the path to pre-fabrication! Tech

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