



Leading the Way

How one school district is using the Project Lead the Way program to implement STEM and embrace 21st century learning

by Amanda Hankel, editor

For [Dunlap Community Unit District 323](#) in Peoria, IL, quality education means more than mastering reading, writing and arithmetic. According to [Jay Marino](#), superintendent for the district, it's about meeting 21st century learning standards. What, exactly, does that mean? It's outlined in the district's mission and vision, and can be seen in the way its high school and middle school curriculums have evolved in recent years.

“Our mission is to empower students to excel in a global society,” Marino said. “Our vision statement says we'll do that by creating self-motivated learners, critical thinkers, effective communicators, skilled collaborators, responsible and culturally aware citizens and technology capable creators.”

Like schools in most states, the district has moved to embrace the [Common Core State Standards](#), which focus on teaching higher-ordered thinking skills—such as synthesis, analysis, evaluation, innovation and creativity, said Marino, who is also an international consultant on continuous improvement and K-12 Systems Chair for the ASQ Education Division. As the Dunlap school district becomes more rigorous in its focus on embracing 21st century learning standards, it has increased its focus on the areas of science, technology, engineering and math (STEM) because the two go hand-in-hand, Marino said.

Leading students to STEM

In the past couple of years, the Dunlap school district has revamped its high school curriculum—and this year, it's middle school exploratory program—to increase student exposure to the STEM areas. To do this, the district has adopted courses from [Project Lead the](#)



[Way \(PLTW\)](#), a provider of STEM education curricular programs used in middle and high schools across the United States.

According to the PLTW website, its STEM education programs “engage students in activities, projects and problem-based learning, which provides hands-on classroom experiences. PLTW's comprehensive curriculum for engineering and biomedical sciences has been collaboratively designed by PLTW teachers, university educators, engineering and biomedical professionals and school administrators to promote critical thinking, creativity, innovation and real-world problem solving skills in students.”¹

More than 4,200 schools in all 50 states and the District of Columbia are offering PLTW courses to their students in the 2011-12 school year, the website reports.² And, studies have shown students exposed to PLTW courses are outperforming their peers in school and they are more focused on attending college than non-PLTW students.³

At Dunlap schools, the adoption of PLTW has meant the addition of courses such as Design and Modeling; Automation and Robotics; Flight and Space; Gateway to Technology; Pathway to Engineering; and Principles of Engineering.

“We’ve found our students have really been motivated by these courses that take STEM and wrap it into a project-based approach to learning those skills,” Marino said. “We’re seeing a lot more registrations at the high school level in our STEM courses. It’s really a dynamic way for students to get engaged with the STEM focus areas.”

PLTW courses provide students with multidisciplinary skills and integrate the focus areas of STEM. This integration of several disciplines, Marino said, is probably the greatest difference between PLTW courses and traditional education courses.

“I think it’s a whole new dimension of learning, where traditional courses really don’t integrate many other disciplines,” Marino said. “[In PLTW courses], students are working hands on. They’re using technology, creating prototypes and models, and working together in teams, which is a lot of what 21st century learning is about. By focusing on critical thinking, effective communication, collaborating with other students and using technology in a way that is very



project-based, it takes the four focus areas of STEM and brings them to life for students so they see the real-life application of their learning.”

The bigger picture

After implementing PLTW in its high school years ago, Dunlap school district just moved the initiative down into its middle school curriculum this school year.

“Every middle school student participates in one PLTW course so when they reach high school, they have experienced that kind of learning, and they have more of an aptitude and interest for it,” Marino said.

In the future, the district hopes to continue expansion of PLTW to the elementary level, exposing more students to STEM concepts even earlier.

“We don’t want to limit our STEM offerings to only PLTW,” Marino said. “But when you’ve got a pre-packaged, high-quality program, it doesn’t make a whole lot of sense to reinvent the wheel or recreate the kind of experiences and materials that are already designed to help meet those new common course standards and focus on those STEM focus areas.”

In terms of the difference PLTW way is making in motivating or preparing students to pursue STEM areas after high school, the district is just now beginning to collect data to answer those kinds of questions. Marino said the district is implementing a postsecondary survey of students who leave the district and go into post-secondary education.

According to PLTW, a survey of PLTW seniors at the end of their senior year found that 92% intended to pursue a four-year degree or higher, 51% intended to pursue a graduate degree and 70% intended to study engineering, technology or computer science. By comparison, 67% of all beginning postsecondary students intended to pursue a bachelor’s degree or higher, as reported by the National Center for Education Statistics.⁴

Furthermore, an analysis of college transcripts of PLTW students who graduated in 2007 or 2008 showed 31% of PLTW students study engineering and engineering technology in their



first year of college compared with 8% of all first-time freshmen in baccalaureate institutions or 5% of all postsecondary students. PLTW reports students are four times more likely to study engineering or engineering technology in college compared to first-time freshmen at four-year institutions.⁵

For schools looking to focus on STEM the way Dunlap schools have, Marino said implementation of STEM in the classroom must be connected and align with the strategic plan of the school district.

“For any school system to feel like they’re going to make effective progress in the STEM focus areas, I think there has to be some real buy-in at a strategic level. It can’t just be a random, ‘let’s implement this little piece here and call it our STEM initiative,’” Marino said. “It really has to be embedded in the mission, vision, values and goals of any school system.”

That is what Dunlap Schools has done in establishing its vision, mission and goals to embrace 21st century learning—a broader initiative in which STEM is a core piece, but that also connects other important areas of study.

For example, the high school has added courses such as global studies, providing students with a better understanding of culture throughout the world. It’s also added foreign language at the middle school level for all students.

“In doing all of those things, we believe we have increased the quality of education in our school system because we’ve provided opportunities for students to be exposed not only to STEM courses but to cultural awareness, foreign languages and more,” Marino said. “All of that combined has contributed to an increase in quality education in our school system.”

References

1. Project Lead the Way, “Who We Are,” <http://www.pltw.org/about-us/who-we-are>.
2. Ibid.
3. Project Lead the Way, “Fact Sheet: Survey Highlights,” http://www.pltw.org/sites/default/files/PLTW%20Student%20Outcomes_1.pdf.
4. Ibid.
5. Ibid.