The Sky is the Limit

Partnership supports integrated technology and engineering program in Brillion

Shelby Anderson

Steve Meyer, a technology and engineering teacher in the Brillion Public Schools thinks he may have the answer to the nation's skilled workforce shortage: K-5 STEM classes.

"I'm convinced that it's one of the best ways to fill the shortage," Meyer said.

When asked what his elementary students have been working on, Meyer talks about his chemical and aerospace engineering projects. That's right, advanced engineering with elementary school students. While the lessons may not be hitting the technical level of college-level courses, Meyer said his students are wrapping their heads around advanced concepts with hand-on projects.

"Kids in elementary school are much smarter than we think," Meyer said.

"It's amazing how fast they gobble up information," adds Brillion High School Principal Paul Nistler.

Students in the Brillion Public Schools have a habit of surprising their teachers and school leaders.

In 2007, the Ariens Company, a snow blower and lawn mower manufacturer in Brillion, funded a $1.5 million addition to Brillion High School to house the 5,000-square-foot Ariens Technology and Engineering Education Center.

When the school district first approached Ariens Company executives, the company agreed to partially fund the high school addition. The company's top executives changed their minds when they saw a presentation by Brillion students where they described what they were currently working on and what, with a new technology and engineering center, they hoped to accomplish. The presentation impressed Ariens Company executives and they decided to completely fund the school's addition.

Engineering and Tech Ed 2.0

The addition, known as the Ariens Technology and Engineering Education Center, includes a 58-seat lecture room, a design room equipped with computers, a fabrication lab fitted with CNC (computer numerical control) machines, electronics, robotics equipment, laser engravers, and a large, four-plex material processing lab.

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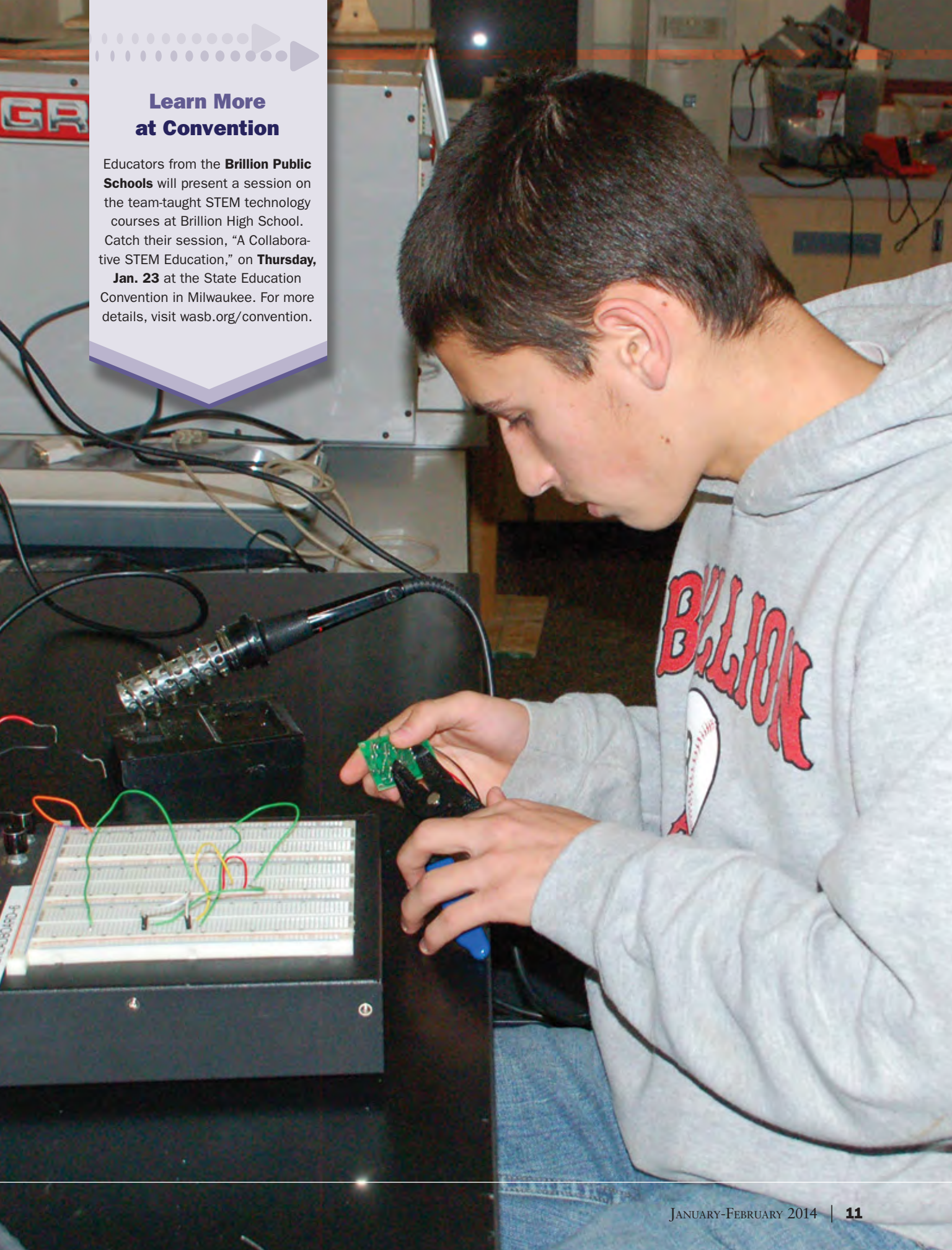
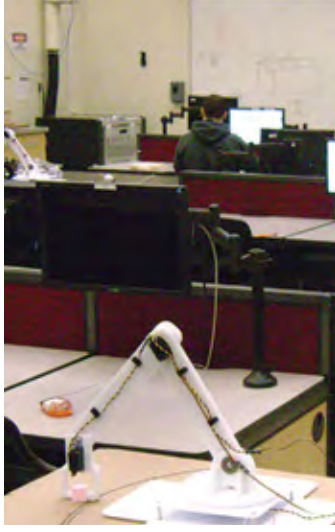


Learn More at Convention

Educators from the **Brillion Public Schools** will present a session on the team-taught STEM technology courses at Brillion High School. Catch their session, "A Collaborative STEM Education," on **Thursday, Jan. 23** at the State Education Convention in Milwaukee. For more details, visit wasb.org/convention.



Some of those classes include computer-aided design and manufacturing (CAD/CAM) and a class simply called STEM that is open to sophomores, juniors, and seniors and focuses on all areas of STEM through project-based learning.

During a recent visit to the school, students in an automation class, one of the many technology and engineering classes available at Brillion High School, were working on devices that would serve Kool-Aid. The students had to figure out how their machines would dispense the correct ratio of water and Kool-Aid, mix, and serve the final product. Some students were working together while others were soldering LED lights and other electronics to circuit boards. It was evident that, to tackle this project, students were using knowledge from a number of classes and disciplines.

"I don't know how you teach technology without teaching other subjects like math," Meyer said.

In fact, Meyer said the nationwide push for more STEM-focused classes is great but he worries that too often the elements of STEM — science, technology, engineering, mathematics — are taught singularly.

"We should be integrating all of those pieces in our classes," Meyer said. "The real power of STEM is understanding the relationships of all of these classes."

Back in the classroom, while students work quietly on their projects, Meyer stood at the head of the classroom, going over to students who raised their hand. Meyer said he often views his role as a facilitator of learning.

"We've been able to develop extremely rich projects where students teach themselves," Meyer said. "If you learn something yourself, you own it."

A lot of students at Brillion High School are opting to "own" their learning. Of the 320 students at the high school, about 200 take a technology and engineering class. Meyer is also quick to point out that more than 30 percent of those 200 students are female students.

Meyer understands that a lot of these students won't be pursuing careers in engineering or technology, but points out that the knowledge and skills they gain in the technology and engineering classes helps support learning in other subjects.

"The work they do in here reinforces the work they are doing in other classes," Meyer said. "They are applying knowledge to real world applications. This kind of learning is good no matter what occupation they go into."

New Ideas

Looking ahead, the district is also excited about offering more team-taught technology and engineering classes. The district has held several so far. One team-taught class paired an agriculture teacher with a technology teacher; they had students build water tanks and team taught a class on aquaponics. Another team-taught class developed a trailer camera and powered it with reclaimed solar panels. Students placed the camera in a nearby wetland and focused the camera on a duck nest, which students monitored as ducklings hatched.

"Having different teachers come in and help team teach a technology course has been integral for getting new ideas," Nistler said. "The sky has been the limit here with ideas and projects."

In addition to classes, other opportunities for students have evolved out of the district's partnership with the Ariens Company. Meyer said a couple of employees from the Ariens Company will actually take a technology and engineering class at Brillion High School with the students.

"They will be learning right alongside the students," Meyer said.

Another opportunity allows a select group of senior students to work on a project closely with the Ariens Company. The seniors are working on a project involving the deck of riding lawn mowers.

Elliot Piepenburg is one of the students involved in the senior project. He and the other students meet after school or during study hall to work on the project. Piepenburg, who will be attending the University of Wisconsin-Madison, plans on studying engineering.

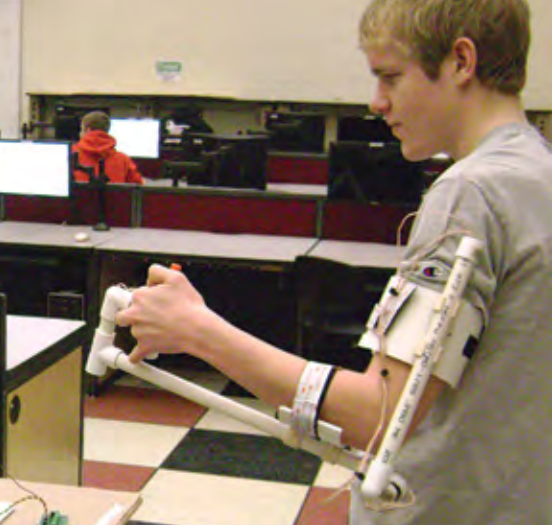
"Opportunities here at Brillion have definitely opened my eyes to the world of engineering," he said.

Investing in Teachers

When asked about the technology and engineering education in the district, Brian Horn, president of the Brillion School Board, first talks about focusing on educators.

"We have been implementing the PLC concept for a few years now and hope to invest even more in training staff," Horn said referring to professional learning communities (PLC), which provide a structure for teachers to collaborate to improve student learning.

As for the technology and engineering education, Horn said the board has been supportive. Before Brillion High School partnered with the Ariens Company to build the



Far left: *Students work on a mechanism programmed to dispense and serve Kool-Aid.*

Left: *A student demonstrates the bio-arm, which replicates arm movements and functions.*

high school addition, the school board made a curriculum change revamping and refocusing its technology classes.

"Rather than attempting mastery of any specific subject — for example, wood shop, welding, drafting — we are attempting to create an interest for a career path for the student to pursue in a post-high school educational setting," Horn said.

With a refocused curriculum in place and with the addition following soon after, Horn said this put the pieces in place for a successful technology program. However, he is quick to point out that it is the staff that has taken the technology and engineering classes to the next level.

"A building is just that — a building," Horn said. "It takes a highly motivated staff supported by top-notch administration, and all the partnerships they have developed in so many areas, that have made it successful."

Forming Partnerships

While not every school has a world-class manufacturing and engineering firm like the Ariens Company across the street, school leaders at Brillion say that the partnerships and opportunities for students they've developed in their schools can be replicated in other districts.

"I think boards will be quite surprised that local industry and businesses are very eager to support such programs at many levels," Horn said.

Horn also said, just as important as working on partnerships with local industry is having a motivated and focused staff.

"Getting the right people in the right places is key for anything to work well," Horn said. "Our tech ed people are more than happy to share the ideas that have made the program successful."

Since the Ariens Technology and Engineering Education Center opened at Brillion High School in 2007, Meyer said the district has given about 60 tours to other schools and industries interested in getting something started in their communities.

"When industries and schools get together, magical things happen," Meyer said. "Schools can't do it alone and industry can't do it alone either." ■

Anderson is editor of Wisconsin School News.