

Nashville CTE Program Uses Intelitek® to Certify Students in Mechatronics and Automation



Educating students for future mechatronics and automation careers

THE CHALLENGE

Like many other areas of the country, the Nashville metro area has difficulty hiring applicants with general technical skills to meet the job demands of the local business community.

THE SOLUTION

Metro Nashville Public Schools has invested in a robust array of CTE programs, including manufacturing and automation skill development and certifications for students in grades 10-12 through the study of mechatronics, robotics, and automation.

THE RESULTS

The Intelitek curriculum and machines are used to train students for industry certifications that prepare them to be hired immediately after graduation in jobs earning \$23 per hour or more in automation and manufacturing sectors.

MCGAVOCK HIGH SCHOOL

Integrated manufacturing training prepares students for real industry roles



DESIGNING AN ENGINEERING PROGRAM

When Todd Young, CTE engineering teacher at McGavock High School at Metro Nashville Public Schools in Tennessee began to design his three-year curriculum, he wanted the focus to be on mechatronics engineering. Mechatronics is a multidisciplinary field for advanced automation in manufacturing that blends mechanical engineering and electrical and electronic systems.

“They used to require three years in a career-oriented course, but now two years in one pathway is required for CTE,” said Young. The full program is three years long:

- Mechatronics 1 – 10th grade
- Mechatronics 2 – 11th grade
- Advanced automation – 12th grade

“In tenth grade we start with a basic understanding of tools and tool measurements,” said Young. “We also teach a fundamental course in electrical things and bring in a big dose of math because students study fractions in fourth grade and by tenth grade, they may have forgotten how to reduce fractions.”

However, the first two weeks of tenth grade, Young also teaches students about money. “Kids don’t understand money,” he said. “They don’t understand what \$23 per

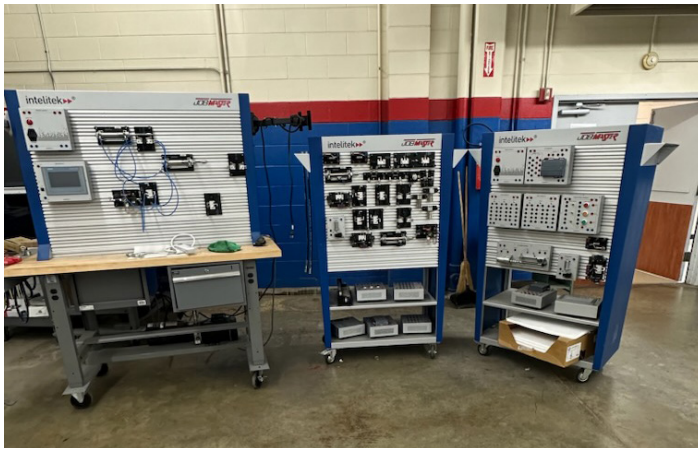
hour really means; students don’t have any idea of how much it will cost them to live on their own after graduation.”

After this practical, real-world dive into personal economics, Young moves students into Intelitek’s robust course on electronics. By the end of tenth grade, he wants to get them certified in OSHA 10 manufacturing. This certification is basic industry training on how to recognize and prevent hazards in a general industry setting. This certification is helpful to students when they look for employment.

KEEPING STUDENTS ENGAGED

There is a state mandate to have 24 students in a CTE class. When working on large, costly systems, you can only actively engage three to four students at a time. “The problem with teaching shop,” said Young “is that if you have three kids working on a project, what are the other 21 doing?” Young designs his courses to keep his students busy. All of his students are actively working on something, and they rotate until they’ve all had an opportunity to work on the equipment during class time.

“We had a good pass rate this year on the Yasakawa robotics operator certification,” said Young. “ 16 of 24



of our students passed. Next year I hope to add the Intelitek Cognex Vision System. This system introduces students to smart automation technology by connecting cameras and computers to provide training needed for part inspection, robotic guidance, and industrial automation. The Cognex vision training for machine vision also will lead to a certification for students.

INDUSTRY PARTNERS AND JOB OPPORTUNITIES

Berry Global, a global innovative packaging and engineered products manufacturer, has two factories locally and 137 worldwide. The state program requires that every tenth grader go on a field trip. However, most manufacturers are under orders from their lawyers to not allow anyone under 18 on their shop floors. Yet, Berry Global sought out a school to partner with. The company has a new workforce development executive who was most interested in students who want to be mechanical or electrical engineers.

The Berry Global representative told students if they earned all five of the available certificates in McGavock’s program, Berry would hire them right out of high school at \$23 per hour. “We will find a place for you,” he promised. One of Young’s students was fluent in Swahili. She was technically qualified and can speak and write Swahili. On the spot, he offered her a job at their plant in Texas. They’ve hired immigrants but have difficulty communicating with them. The student was going to graduate in two months. He asked her if she would be willing to relocate to Texas for a lead position for \$27 per hour. She said yes. Two months until graduation and she already had a job.

Bridgestone is another industry partner and there are two new auto plants moving to the area. They are building a new Fedex portal in Nashville using a vision system. Amazon is also using a system that detects any defect on the boxes. Job prospects for Young’s students are quite good—particularly if they take advantage of the five available industry certifications at McGavock.

HANDS ON CTE TRAINING PROGRAMS

Young has two big JobMaster panels from Intelitek and two hydraulics trainers running simultaneously. “One of the things I really like about Intelitek is the vertical panels on all the training equipment,” said Young. “Instead of the flat panels that other systems provide, Intelitek’s vertical panels on the JobMaster series has everything facing you and the students. You can see, the students can see, and the peer-to-peer learning is so much better.”

ESSENTIAL TRAINING

During their junior year, Young’s students work with precision measurements and instruments. They use Intelitek equipment when they work on pneumatics and hydraulics training. As an instructional strategy, Young relies on repetition. “Kids need repetition to learn,” said Young. “Look at US Army basic training. Name somewhere else you learn so much in eight weeks.” Young uses repetition because it works, and his students get certified which is very beneficial.

Also during their junior year, students transition to using simple robots. “The hardest concept for students to grasp is interference areas to keep robots contained,” said Young. “With robotics, students not only learn robot manipulation, but also time and environment—an important concept in manufacturing.”

In twelfth grade, students work toward two Yaskawa Industrial Robot Certifications, either for a Robot Operator or Robot Programmer. Intelitek has partnered with Yaskawa MotoMan Robotics, a world leader in industrial robotics to deliver training and certifications. The curriculum and project-based activities prepare students to work with real world industrial robots. This Yaskawa endorsed certification is highly revered in the industry and gives candidates yet another advantage when searching for a job.



INTELITEK PROGRAMS AT MCGAVOCK

McGavock has multiple curriculum solutions and labs. Initially, their focus was STEM (VEX robotics). Now they have Intelitek's fundamentals of manufacturing and NIMS certifications. The school also has CNC Machines, JobMaster Pneumatics, Hydraulics and PLC courseware. Intelitek's Programmable Logic Controller courseware gives students a solid grasp of industrial PLCs, ladder logic programming, inputs and output devices and electrical control. In 2021, McGavock purchased Intelitek's industrial robotics and machine vision from Yaskawa and Cognex.



RECOMMENDATIONS FOR OTHER PROGRAMS

Young reflected on what other schools should consider as they think about a similar program:

- **Understand the needs of the community** so you don't teach students a job that can't earn them something. Know your area.
- **Understand industry standards** – and space and plan environment so more kids can be working. You need to have busy environment. They won't learn watching.
- **Offer certifications.** Young had students who went into hospital food service. They received \$2 more an hour because of their certifications.
- More schools should offer similar programs. Demand is not for office administrators, but for people on the shop floor doing the work.

"The thing I love about Intelitek is that the curriculum matches their equipment," said Young. "I also like their training. Classes are small and effective and help me do my job."



INTELITEK PARTNER NETWORK

Our business and technology partners share our vision of enhancing Career and Technology education by helping schools achieve their CTE goals.

McGavock High School was supported by our partner in the region, Learning Labs Inc.

