## **Small Texas District**







# GAINS

By Tom Farmer

all it the perfect storm, an answer to prayers, an inevitable shift in light of a changing job market or a natural evolution in education. Whatever the reason, CTE and science, technology, engineering and math (STEM) are gaining momentum in Texas, even in rural school districts, thanks to support at the top, weighted funding and business/industry connections.

A perfect example is Somerset ISD, where everyone in the rural community is pulling in the same direction—toward improved college- and career-readiness via real-world, hands-on experiences for students. As part of targeted improvements and upgrades in this economically disadvantaged school district, longtime superintendent Saul Hinojosa and a supportive school board have put K–12 STEM and CTE front and center, committing to make it a priority, regardless of the financial or other hurdles encountered.

With such pronounced buy-in at the top, a natural trickle-down has occurred. And it hasn't taken long for the transformation to be embraced. Such is a luxury in small rural schools and districts where bureaucratic channels are fewer and community support or opposition quickly determines a program's fate.

Angela Dominguez, principal at Somerset High School, was eager to get on the STEM/CTE train, and she points to distribution of her faculty as proof that CTE is being taken seriously. "English used to be my largest department with 11 teachers, but that's changed," Dominguez said. "My [CTE] department is actually now my largest department. We have 15 teachers in that department, and it used to be like seven or eight."

## Handling the Funding Challenges

Having the superintendent and board endorse a curriculum shift is one thing, but funding it is quite another, particularly in a rural school district. Rallying the community to support a local bond issue was step one for the board, and the second step was the passage of Texas House Bill 5 in 2013, which brought significant change to state CTE funding. In effect, HB 5 serves as an equalizer among districts of varying size by increasing funding when CTE courses are added. The bill also requires all freshmen to choose one of five endorsement areas-STEM. business and industry, public service, arts and humanities, or multidisciplinary-and they then may work toward a distinguished level of achievement within their endorsement area.

"[CTE] courses now are weighted funding, so they actually tend to pay for themselves because they're based on the number of students participating. So you get more state-allocated funding every time you offer a CTE course," said Dominguez, who testified in front of the state legislature and the Texas Workforce Commission about Somerset's shift to more career-focused curriculum.

Further addressing the funding challenge, Somerset's Associate Superintendent of Instructional Services Phil Chavez says the district has pursued all available resources along the way to bolster a broad array of CTE offerings: agriculture, architecture and construction, arts, audio/ video tech and communications, business, career development, corrections and security, distribution and logistics, health science, hospitality and tourism, human services, IT, law, manufacturing, public safety, STEM and transportation. Additionally, the district's funding sources include the Title VI Rural and Low Income School Program.

"Somerset does not have the business and industry tax base most inner-city districts have, so we must rely on state and federal funding," Chavez said of the community that is home to 1,600 residents within 88 square miles of mostly farmland. "Somerset has effectively leveraged state career and technical education funds and federal Perkins grant funds to offer a plethora of CTE-coherent course sequences."

## Connecting With Business and Industry

STEM/CTE is a natural fit in districts like Somerset that have low percentages of students who are deemed college-ready, though college preparation is still emphasized as evidenced by the recent opening of an early college high school in the area. Skills that students acquire through CTE courses can often lead to high-paying careers with companies such as Toyota Motor Manufacturing Texas, which operates a plant just up the highway from Somerset.

Toyota officials have long recognized the benefits of CTE courses and have even lobbied heavily in favor of HB 5. Mario Lozoya, director of government relations and external affairs for Toyota Texas, helped shape the law and has been active in Somerset and other area school districts, visiting STEM and CTE programs and suggesting specific courses that might eventually yield high school graduates who possess the technical skills and certifications needed by skilled maintenance technicians at Toyota. "There's a shortage of people with those skill sets," Lozoya



said. "We have 20 openings (out of 256 positions) that we can't fill."

Toyota financially supports the cause it advocates, as well. In addition to donating vehicles to nearby school districts, the auto manufacturer provides grants and other resources. Acknowledging that STEM and CTE knowledge must be introduced at an earlier age if high school students are expected to discover their specific interests and aptitudes early on, last summer Toyota funded a second Pitsco Education STEM lab at Savannah Heights Intermediate School in Somerset. The lab provides deeper career exposure to fifth- and sixth-grade students through the hands-on study of electricity, energy, circuits, ecosystems, rocketry and more.

"When you start talking to a high school senior or junior, you can't redirect them. They're already on a certain path. You already missed them," Lozoya said. "So we need to start down in the middle school layer and sometimes even further down."

Savannah Heights Principal Julie Riedel says the labs have led to stronger student interest in STEM careers, which resulted in the formation of a STEM Club that meets after school. Best of all, she is certain that students are learning in the lab because they are *doing*.

"If the kids are doing the work, they are the ones who are learning. If the teacher is doing all the work, then the teacher is just imparting knowledge," Riedel said. "That doesn't mean the kids know it. It just means that the teacher knows it. That's the beauty of STEM and the integration of technology, math and science—the kids are doing it."

Chavez points out that even though relatively few businesses and industries are located in the mostly agricultural area that encompasses Somerset ISD, teachers and administrators capitalize on all their opportunities.

"Toyota has provided our students with exclusive tours of the facility to get hands-on experience with the inner workings of a modern technology-driven manufacturing plant," Chavez said. "The soft skills Toyota employees utilize every day align with the 21st-century skills our students learn when working collaboratively in the STEM laboratories."

An effort to establish deeper and more meaningful relationships with Toyota, as well as other businesses and industries, is now under way. "Our goal for this year is to create advisory councils made up of industry leaders, staff and community members in each of the CTE programs offered," Chavez explained. "The goal of the advisory councils is to provide guidance on the direction of each program to ensure industry standards are met through curriculum, equipment and facilities."

## Vertically Aligned, Career-focused Curriculum

With two STEM labs at the intermediate level and another at the middle school, students arrive at Somerset High School having experienced many specific career fields, which in turn has helped shape their interests. Pitsco engineering and biotechnology labs are set up for freshmen to further sharpen their career interests before selecting a formal career pathway beginning their sophomore year. The new GEAR UP program also provides



Students Find the Right Track

One piece of equipment. One activity. One experience. Sometimes, that's all it takes to ignite student passion and set them on a collision course with the perfect career. Enrique, a sophomore, and Destiny, a freshman, have found their inspiration while working in the Pitsco Principles of Engineering and Biotechnology labs, respectively.

### Enrique

Teacher Jonathan Boykin's Principles of Engineering course was the highlight of the school day for Enrique when he was a freshman. That's where he learned about airfoils in the aerospace module. "Students can model their own wings and actually put them to the test," Enrique said. "I'm very familiar with the traditional aircraft airfoil, and I wanted to experiment. So, I made a modified airfoil and I decided to test it. I've always wanted to test a wing or an aeronautical design of my own using a wind tunnel tester, so I found this very helpful."

An aspiring aerospace engineer, Enrique discovered that his airfoil design produced downforce instead of lift. "For an airplane, that wouldn't actually be good, but for a car that would be good because that's like a spoiler on the back of sports cars. They want the car to stay on the road."

With that experiment under his belt, Enrique was motivated to take Boykin's robotics course as a sophomore, when he used the TETRIX® Building System to design a robot for the SkillsUSA® Robotics: Urban Search & Rescue competition—just another building block in a solid STEM career foundation. counseling and guidance from middle school through high school and ensures students are on the right track according to their natural interests and abilities.

Dominguez credits these courses and programs for establishing clearer paths for students. "We opted to have the labs be the entry course in high school, and there were two reasons behind that. Number one, it's super engaging. It hooks the kids from the onset. The second reason is the career exploration in each of the modules and the value in that in terms of helping freshmen make good decisions."

Engineering/robotics teacher Jonathan Boykin says it is just as valuable for freshmen to discover what they're not interested in as it is to uncover their true passion. "Popular culture, it glamorizes the concept of an engineer. It looks like it's a rock star fun job, and they don't always show the math and work that go into it. I think when the kids start to realize what it really is, they can self-identify if this is the right path for them or not, which I think is really important on the high school level. If you think you want to be an engineer because you think it's X when it's really Y, you get to college and discover it's hard. Because you start in engineering classes from the very beginning, you've lost a semester of college. It's better to figure that out now."

Progressing through Boykin's engineering, robotics and STEM courses is as much a discernment process as a knowledge grab. Take Joel, for example. "He wants to do things that are more mechanical engineering, but he really likes cars," Boykin explained about one of his students. "He's trying to find a merger of the two. I don't know if he'll end up on the engineering side or on the automotive repair side in the end, but he likes those pieces, and he'll find the fit that works for him."

On the health-care side, teacher Sierra Alcoser witnesses the same scenario playing out on a regular basis in the freshman biotechnology course. "Each module is dedicated toward one specific topic. Allowing students to rotate into a topic and be there for seven to 10 days, focusing on that one topic, allows them to try it out. Once you get to college, you don't get to try out a new major; tuition won't let that happen. Here, they can say, 'I really love immunology. I want to be an immunologist.' The rotations allow them to try out specific careers."

Just a few years ago, prior to the passage of HB 5 and before a bold decision by the local school board and superintendent, such career-rich experiences for Somerset High School students would have been few and far between. Now, the pathways to numerous careers have been well established, giving students countless opportunities to experience and experiment before making a big decision that not only shapes the rest of their lives, but also directly impacts the workforce available to local businesses and industries. Tech

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### Destiny

Adjacent to Boykin's classroom is another module lab, this one focused on biotechnology, for students who are interested in the sciences that lead to jobs in medical or related fields.

Destiny took the course in part because she had experienced a module lab at Somerset Junior High School. She came into the course with *thoughts* of a career in the medical field, and she left with *plans* to pursue the career of her dreams.

Lab facilitator Sierra Alcoser, like Boykin, doesn't just assign chapters to read, conduct a couple of experiments and administer tests. She brings learning to life, giving students opportunities to experience what it's like to work as a researcher, nurse, doctor, surgeon or physician's assistant when they explore modules such as Immunology, Genetics, Body Systems and Heart Fitness.

The seven-day rotations through more than 10 modules gave Destiny plenty of career options to consider as she learned more about the specific work done by medical professionals. Then, Alcoser took a group of her biotech lab freshmen, including Destiny, to nearby University Hospital-San Antonio for a field trip to reinforce what they had been learning during the modules.

"They were talking about the respiratory system with babies and stuff," Destiny recalled about the field trip. "I took different modules here like Body Systems, where I learned about the respiratory system. I was able to ask questions about that because that's stuff I knew."

Could Destiny see herself one day working at University Hospital? "Yeah, I'm interested in that," she said, before adding with an air of assurance, "Yeah, I'm going to work there."

