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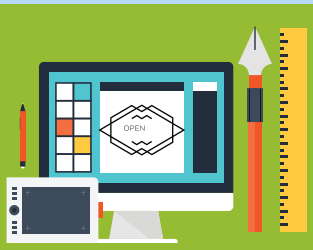

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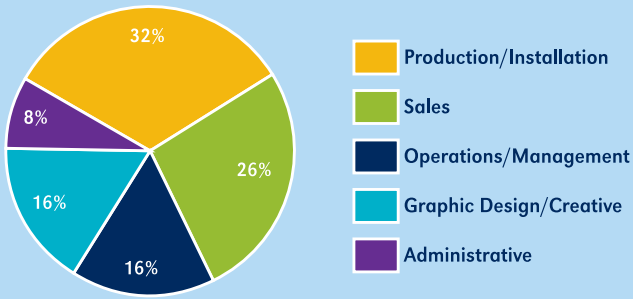

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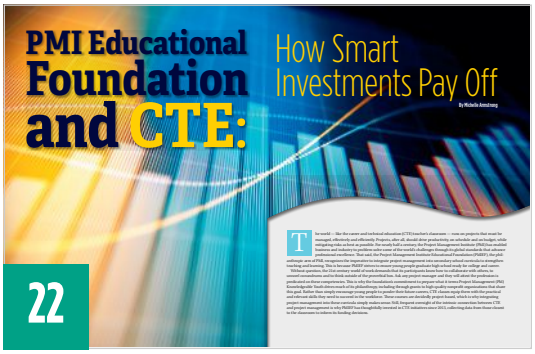

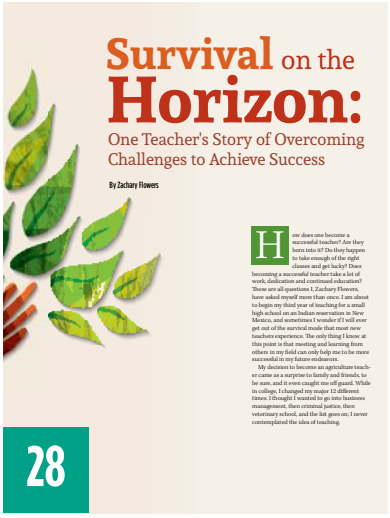

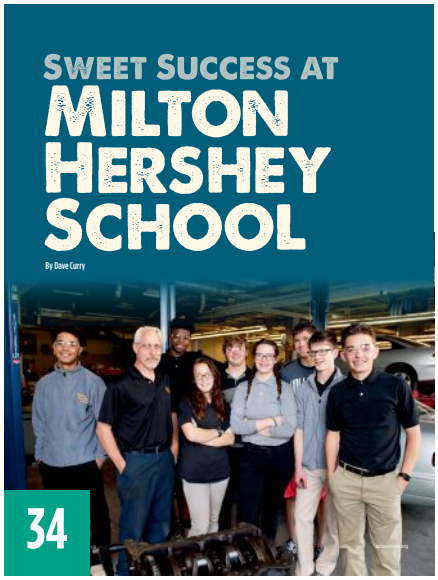

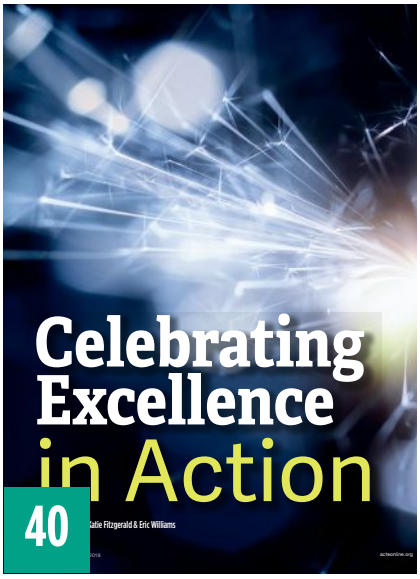

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CTE SUCCESS STORIES

WHY SHOULD YOU BE A MEMBER OF ACTE? MY NUMBER ONE ANSWER IS ADVOCACY!

How about our national association, along with Advance CTE, and all their hard work on behalf of career and technical education (CTE) in Washington, D.C., and their recent success? Congratulations to the ACTE public policy department and thank you for their lobbying efforts that helped secure a $75 million increase in the Carl D. Perkins Career and Technical Education Act Basic State Grants, bringing the total investment to nearly $1.2 billion. Thank you Steve, Alisha, Jarrod, Mitch and Catherine.

CTE Success Stories was a tough subject to narrow down, as there are thousands. First, I think about our own ACTE Teacher of the Year, Linda Romano, who teaches health science education (HSE) at Newburgh Free Academy in Newburgh, New York. What an amazing story she tells: from a lost student in high school who struggled with academics, self-esteem and bullying to CTE and a nursing career, to then become a CTE teacher for struggling youth in an inner city. She credits her success to CTE teachers' dedication to helping her gain confidence; with their help, she connected the dots and applied her knowledge and skills in a clinical setting — much like CTE apprenticeship programs are doing.

Romano has grown a struggling program of 12 students to more than 250 today. Not only has she become a great nurse and successful CTE teacher, she does so much more beyond the call of her everyday job. Every Saturday she gives back to her community, where she started a program for children in grades pre-K through six, called "Scholars in Scrubs" at the Newburgh Armory Unity Center. Romano volunteers with middle school after-school programs, summer internships, and Kindergarten to Career pathways, the latter of which helps bridge the gaps between academics, college and careers. But what is really cool about this program is the opportunity for Romano's high school HSE students to volunteer with the program and develop leadership skills in their communities.

And then there is my CTE success story. I was 19 years old; I had failed out of college and was working as a rental car representative (which I hated) when I enrolled in an emergency medical technician class at Nunez Vo-tech in Chalmette, Louisiana. There I had the best teacher ever and wanted to be just like Sue! This began my wonderful career (and first passion) in emergency medical services (EMS) over 40 years ago. I went on to enroll in Indian Capital Technology Center's paramedic program and soon became an EMS Instructor. Then I found my way into career and technical education as a teacher, and there I found my second passion: CTE. I obtained a master's in career and technical education from Wilmington University in Delaware, and now I have had the awesome opportunity to serve as ACTE's Board of Directors' president. What a great CTE adventure it has been!

Linda Romano described ACTE as a "network of professionals who have the power to support, nurture and gain strength together to make a difference one child at a time, one life at a time, leaving this world a better place."

To all our CTE teachers and administrators thank you for what you do!

Gina Riggs
ACTE BOARD OF DIRECTORS PRESIDENT

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2018–19

Techniques

2018–19 EDITORIAL CALENDAR

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- **APRIL 2019: Making the Case for Family and Consumer Sciences** '19
- **MAY 2019: The Future of Career Development** '19

WRITE

Written by and for career and technical educators, ACTE's flagship publication addresses the issues our industry cares about most, providing input you can trust when making decisions for your classrooms, programs and school systems. *Techniques* is published monthly from September through May (with a double issue in November/December) and accepts wholly original content for publication on a revolving basis.

To learn more about *Techniques*, or to submit a brief proposal for consideration, visit www.acteonline.org/techniques.

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HOW TO CHOOSE THE BEST SIMULATION FOR YOUR WELDING PROGRAM

By Diane Ross

THE DRIVE FOR CREDENTIALING IN CAREER AND TECHNICAL EDUCATION (CTE) HAS BEEN A BOON for students, inspiring educators to rethink how they prepare students for high-demand, high-skill and high-wage jobs. CTE program administrators strive to hire certified instructors, and funding is often based on the number of students to achieve certification in high-demand, high-wage and high-skill fields.

In the past, this might have meant purchasing high-cost equipment to mimic the workplace. Students would train on those products and perhaps become proficient. But now preparing students for these jobs is less about equipment, and more about the skills necessary to move into a career in a chosen field.

The Cost of Hands-on Learning

When you think about a hands-on learning resource for welding programs, you might consider that welding is hands-on by nature. Often, welding students gather at a distance, all dressed in protective equipment and darkening helmets, as they observe an instructor demonstrate a very intricate technique. Students are expected to watch, understand and then practice. This can be a very costly endeavor; students learning to weld can go through materials very quickly, and they don't always develop a deep understanding of what they are doing. Simulation, in comparison, allows students to experience welding in a way they can't in the booth — learning, for example, why a work angle is critical to creating a weld that will hold. Simulation allows them to experience and improve the skills they need to become certified welders.

Simulation

Simulation is a method for practice and learning. It is a technique (not a technology) to replace and amplify real experiences with guided ones. Through simulation, students can replicate the real-world welding experience and become immersed in an interactive fashion. This results in a deeper understanding of the necessary skills, and it enables them to transfer those skills even faster. In welding, students can master techniques like work angle, travel angle and speed in a safe environment before they enter a welding booth.

> "Simulation is a method for practice and learning. It is a technique (not a technology) to replace and amplify real experiences with guided ones."

Studies show that students who learn to weld in a virtual environment learn faster and more efficiently (Stone, McLaurin, Zhong & Watts, 2013). To create a quality weld, you need to master speed. Welding procedure specifications require a welder to perform an optimal weld at a specified number of inches per minute. If you were told to move your hand from left to right at 11 inches per minute, how would you know how to do that? How would you know if you were going too fast, too slow or just right? You would practice and practice, examining your welds for defects and hoping you would eventually gain mastery.

In the virtual world, students are guided so that they gain muscle memory from the start. They receive immediate feedback and are given the opportunity to alter their speed if necessary. Once student welders have mastered their technique in the virtual world, they can move on to real equipment and welding metal. Making these resources available to many students at once is crucial to the success of the welding workforce.

Consider buying welding simulation technology that:

1. Focuses on core, basic skills developed in the first couple of weeks. This allows students to become competent on the basics, master them and transfer those skills into the welding booth.
2. Offers unlimited student licenses and no yearly update fees.
3. Is designed for that beginning student. High-end welding techniques, like overhead or pipe welding, should be reserved for students who have mastered the basics and have moved on to more advanced learning in the welding booth.
4. Is affordable. Obtain several units so your students all have the opportunity to practice and can be assessed in the system to demonstrate mastery in a timely way. Aim for a 1:2 ratio in your classroom with one simulator for every two students.
5. Results in a score. Virtual reality (VR), by nature, is much like a video game and the only way to get a higher VR score is to develop better welding skills. (Teachers then can use these scores to assess, assess and assess some more.)
6. Can be used as an instructional device by the teacher. Picture students huddled around the teacher in the welding shop, trying to see what is being taught. They can't. If the simulator is connected to a smart board or a projector, however, the teacher can show what a work angle looks like, complete a weld and play back the weld from the perspective of the root, indicating root penetration.

Most students have been exposed to video gaming in their lives and the idea of virtual simulation is native to them. This is a natural world and one that can be developed to increase skills and give students the opportunity to try careers they may not have otherwise.

The United States is in the midst of a welder shortage; the American Welding Society predicts a shortfall of 290,000 welding jobs by 2020, and the industry's focus on productivity is only expected to grow as focus on global competitiveness grows (Wilkey, 2015). By integrating welding simulation, you will enhance the efficacy of your CTE program, draw in more students and, most importantly, produce quality welders. ■

Diane Ross is the education development manager for Realityworks, Inc., where she works with states and school districts to develop better programs, products and pathways in career and technical education programs. She has a master's in secondary education from Marshall University and is an advisor for the National Standards for FACS Education. Email her at diane.ross@realityworks.com.

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CONGRESSIONAL CAUCUSES HAVE SUCCEEDED AT RAISING CTE AWARENESS

By Stephen DeWitt

ONE ISSUE THAT I HEAR FROM THE ENTIRE CAREER AND TECHNICAL EDUCATION (CTE) community has been continuing concern about how to raise awareness and improve perception about CTE. When discussing CTE success in the context of advocacy related to this issue, the U.S. House and Senate CTE Caucuses come to mind immediately.

Not to be confused with primary caucuses that convene citizens to select delegates for the Democrat and Republican political conventions, a **congressional caucus** is a group of Members of the U.S. Congress that meets to pursue common legislative objectives and raise awareness surrounding a common area of concern — in this case, career and technical education.

ACTE has been instrumental in the development of the Caucuses and their agendas. The House CTE Caucus formed in 2007 under the leadership of former Reps. Brian Baird (D-WA) and Phil English (R-PA). Currently, Reps. Glenn 'GT' Thompson (R-PA) and Jim Langevin (D-RI) lead. Similarly, Sens. Tim Kaine (D-VA) and Rob Portman (R-OH) partnered to launch the Senate Caucus in conjunction with CTE Month® in 2014. Currently, they are joined by Sens. Tammy Baldwin (D-WI) and Todd Young (R-IN) as co-chairs.

All of these leaders should be commended for their steadfast support and promotion of the value of CTE in the House and the Senate. We would be remiss if we did not recognize the staff from these offices who work behind the scenes with ACTE and other organizations to develop briefings, letters of support and other activities that spread awareness.

The Caucuses have increased in size and scope as CTE issues have gained in attention over the past decade, and here I need to thank all of you in the CTE field who have asked Members of Congress to join. In some cases, an ask is all it took. In other cases, ACTE members have advocated for several years. That advocacy has paid off; in early 2018 there were 108 Caucus members in the House and 26 in the Senate, and the numbers are still growing!

Although these bodies are informal in nature, the Members of Congress have helped make a difference. For instance:

1. The Caucus co-chairs have initiated letters to appropriators, those who hold power related to federal programs that receive funding, in Congress in support of increasing the amount of funding for the Perkins Act.
2. Co-chairs of the Caucuses have appeared at nearly every event we have asked them to participate. Given their busy schedules, it is particularly difficult to secure Congressional speakers who will commit to events, but the CTE co-chairs have always been there. They secure rooms and work with Capitol staff in a number of ways to ensure success.
3. CTE Caucus briefings over the past several years have been standing room only. Hosted to explore CTE issues in the wake of the reauthorization of the Perkins Act and other CTE-related legislation, these briefings provide career and technical education advocates an opportunity to share our agenda with a wide audience of stakeholders and ensure policymakers understand the connections between CTE and broader issues.
4. A number of important legislative initiatives and bills have been introduced by CTE Caucus members, and ACTE staff are working with more Congressional offices on important CTE policies.

We urge you to identify if your Senators and Member of Congress are members of the CTE Congressional Caucus. Ask them to join if they are not already involved! Your advocacy makes a difference, as the Caucuses are making a difference related to the national discussion about CTE and its value. ■

Stephen DeWitt is deputy executive director for ACTE. Email him at sdewitt@acteonline.org.

LEARN MORE

For more information on the Congressional CTE Caucuses, visit **www.acteonline.org/caucus**.

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MAKE IT MATTER! ACTE'S 2018 NATIONAL POLICY SEMINAR

By Michael Connet

EACH YEAR IN MARCH, SEVERAL HUNDRED PASSIONATE ADVOCATES FOR CAREER AND technical education (CTE) descend upon Washington, D.C., for ACTE's National Policy Seminar (NPS), to educate policymakers about the important programs preparing learners back in their home states and communities. As the leading voice for high-quality career and technical education, ACTE is supported by a diverse community of dynamic CTE professionals. Alongside Americans of all political, geographic and demographic backgrounds, ACTE members visited their federal policymakers to share how CTE is critical to America's competitive advantage and gives everyone the opportunity to pursue a meaningful, productive career.

The 2018 NPS prepared attendees for conservations with legislators about CTE and how they can support CTE programs and students through federal policy and investments. At this multi-day event, participants presented information about the current landscape for policy development in Washington, D.C.; attendees were particularly interested in learning about the specific policy positions ACTE has proposed and supported, and how to communicate them effectively. The highlight for most attendees came on the second day, when they had the opportunity to meet with policymakers and their staffs in both the U.S. Senate and House of Representatives.

> "Career and technical educators are in a critical position to ensure that workers have the skills needed for the jobs that will emerge and evolve."

Getting Started

While attendees are ardent spokespeople for their students, the approach used to teach and administer their CTE programs can differ from the task of educating and influencing policymakers. NPS kicked off on Sunday, March 4, with a session for first-time attendees that provided an overview of the schedule, training and activities participants would encounter. The following morning, Dr. Robert Atkinson, CEO of the Information Technology and Innovation Foundation, addressed the conference to discuss what forces are shaping legislators' thinking. Atkinson shared that, as a society, we are at a strategic inflection point in our nation's workforce, fueled by the continued combination of ever-advancing technology and globalism. He argued that career and technical educators are in a critical position to ensure that workers have the skills needed for the jobs that will emerge and evolve.

A series of subsequent sessions provided attendees with specific updates on legislation, both recently passed laws and those in progress, with an emphasis on the messaging to be conveyed. The Every Student Succeeds Act, the Higher Education Act and the Carl D. Perkins Career and Technical Education Act were among those explored in detail; a special discussion covered the status of federal funding for CTE and related programs in the complex fiscal environment. The first day of programming, intended to prepare attendees for their visits to Capitol Hill, wrapped up as each state met to review itineraries and to discuss how, who and what they would present to officials.

In Person

The second day of the 2018 National Policy Seminar began at the U.S. Capitol complex in the Dirksen Senate Office Building with a special presentation by lead staff working on CTE issues and Perkins reauthorization for the Senate Health, Education, Labor and Pensions Committee and the House Education and the Workforce Committee. These staff shared the latest news from Capitol Hill and their outlook for the rest of the congressional session. Following the panel, attendees were mobilized to spend the rest of the day visiting with their Members of Congress. Constituents who travel to Washington are welcomed as important visitors (and voters!) to these offices.

NPS attendees shared with legislators information and personal stories about their students and the classes they teach. To emphasize the importance of career and technical education, each visiting delegation was supplied with materials to leave behind that communicate ACTE's legislative priorities.

"As more attention is given to career and technical education, it is vital that educators have a voice in informing legislative decisions," said Patrick Biggerstaff, director of career and technical and adult education from the Area 31 Career Center in Indianapolis, Indiana. "The Capitol Hill visits at National Policy Seminar have helped us to focus conversations on program resources, student learning, and state and local outcomes. The fact that legislators and their staffers have already followed up with requests to visit area district career centers makes it clear to me that face-to-face communication is a powerful method of engagement."

For many attendees, this was the first time they had visited their elected officials' offices. An oft-repeated refrain was that the visits were exciting and their feet were sore! The inspiring day ended with a special evening reception in the Senate, co-hosted by the Senate CTE Caucus. Joining NPS attendees and Senators Tim Kaine (D-VA) and Todd Young (R-IN) were students from seven career and technical student organizations, including DECA, FBLA-PBL, FCCLA, HOSA, National FFA, SkillsUSA and TSA, who co-sponsored the event. In addition to speaking with the members of the Senate, each student team presented displays sharing activities and achievements. Everyone left impressed with the students, the reception and their day on the Hill.

Increasing Public Awareness

NPS wrapped up on a third day, with an in-depth look at a special topic — increasing positive public awareness of CTE. Attendees were given a chance to hear from a number of experts about how they communicate CTE's value and benefits to diverse stakeholder audiences. Joshua Starr, CEO of PDK International, discussed the organization's 2017 poll of public perceptions of education and its implications for CTE, and how educators can shape public opinion to support CTE programs and students. Several panels with national and regional representatives also shared their campaigns to educate and inform the public in their communities and across the nation.

"The mix of training and professional development to prepare us for sharing our message is what makes the NPS so special," said Jon Graft, superintendent of Butler Tech in Hamilton, Ohio. "Our business partners and other stakeholders share our vision for a 21st-century education. For our education system to adapt, it is imperative that the people who make laws about education have a full understanding of CTE and how it makes a difference in our communities and throughout the nation. NPS is one of the most effective events for providing the opportunity to share 'why' we are in education, and to secure the support we need: the 'how' we are going to complete our mission of transforming lives." ■

Michael Connet is senior director of outreach and partner development for ACTE. Email him at mconnet@acteonline.org.

ATTEND

Make plans to join us for the next National Policy Seminar in Washington, D.C., March 25–27, 2019. To learn more, visit **www.acteonline.org/nps**.

ACTE CELEBRATES EXCEPTIONAL CAREER AND TECHNICAL EDUCATION AT UDC

By Lia Milgram

IN CELEBRATION OF EXCEPTIONAL CAREER AND TECHNICAL EDUCATION (CTE) — AND ON THE occasion of CTE Month® — Association for Career and Technical Education (ACTE) staff visited the University of the District of Columbia Community College's (UDC-CC) United Medical Center (UMC) Campus for a tour and discussion of the college's Division of Workforce Development and Lifelong Learning (WDLL). Also in attendance were representatives from Advance CTE; the American Federation of Teachers; the National Education Association; the United States Department of Education; the U.S. Senate Committee on Health, Education, Labor & Pensions; District of Columbia Public Schools; and the Council of the District of Columbia.

WDLL at UDC-CC offers valuable job skills training for D.C. residents, so they might pursue and obtain employment in high-demand industries throughout the metropolitan area, including healthcare; early childhood education; hospitality and tourism; construction and property management; automotive and truck maintenance and repair; information technology and office administration; and infrastructure, transportation and logistics. Housed on site at UMC, a community hospital serving southeast D.C. and nearby Maryland, the healthcare pathway is two-pronged: with opportunities for students who wish to serve direct care roles, as well as those who will prefer healthcare administration.

ACTE staff and visitors heard from UDC administrators, faculty and students about the purpose and scope of the WDLL and its healthcare pathway, entry and matriculation requirements, challenges, successes, technology, cost, effective community partnerships and plans for future growth. A tour of the healthcare programs' facilities included traditional classroom and laboratory environments featuring state-of-the-art phlebotomy simulators.

To learn more about the University of the District of Columbia Community College Division of Workforce Development and Lifelong Learning, visit ***www.udc.edu/cc/workforce-development/.***

"Phlebotomy is a basic, invasive technique for patient care and maintenance. All the patient cares about is that you (1) get a high-quality specimen that will deliver results to create a care plan and (2) 'Don't hurt me.'; knowledge will only get you so far. It takes technique and practice with supplies, and 200–300 sticks to develop the necessary skills and confidence. Confidence is huge."

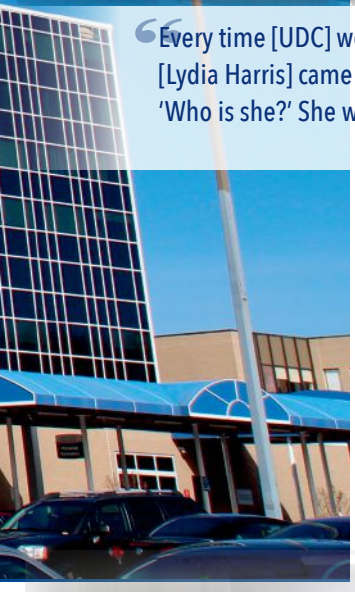
– Ann Semwanga, Phlebotomy Instructor

"Healthcare is analytical; it requires critical thinking and problem solving. A career in healthcare means something different every day, no matter what you learn in the classroom."

– Blaytete Nelson, EKG Instructor

"The healthcare programs at UMC were birthed out of a need."

– Dr. Tony Johnson, Dean



"Every time [UDC] would bring their students [to UMC], I would hire them. When [Lydia Harris] came on the floor, there was a light about her. Everyone was asking, 'Who is she?' She went over and above. UDC students do exceptionally well here."

– Judy Jenkins, Nursing Instructor

"Career and technical education is the backbone of the American economy, and outstanding programs like the ones at UDC-CC play a critical role in fueling the talent pipeline in labor markets all across the country."

– LeAnn Wilson, ACTE Executive Director

"My experience at UDC has been amazing. Prior, I taught preschool and as I started to do more work with the elderly, I became interested in the nursing assistant credential. It's serious. I take it seriously, because the faculty are adamant about helping students help themselves; you can earn many different credentials and certifications. It's a blessing to have the guidance: So you want to be a registered nurse. Here's how you get there."

– Lydia Harris, Graduate

"[The phlebotomy simulator] will scream OUCH! if you make a mistake. We want our students to have the best simulated experience possible."

– Jefre Holmes, Direct Care Pathway Director and WDLL/ United Medical Center Director


STEAM

Full STEAM Ahead

Incorporating the Arts into STEM in Rural Tennessee

By Glenn Cook

Appearances can deceive, but one look at Ryan Jackson will tell you he's not a typical school administrator. Tall and thin, with shoulder length hair and bracelets on his wrists, he speaks in bursts of short sentences, punctuated at times with hashtags instead of commas. His approach to education is both simple and relentless.

"I want to get kids thinking like creators," said Jackson, executive principal of three schools that serve 1,200 students in Mount Pleasant, Tennessee, an hour south of Nashville. "Most of our kids have grown up in an era where creativity has been stomped out of learning. I think we're on to something that can get them excited again."

The way to get students excited, he believes, is by systematically incorporating arts (A) into the traditional science, technology, engineering and mathematics (STEM) curriculum. In this small community, part of the larger Maury County Schools, Jackson is doing just that with the launch of the first K–12 STEAM cluster in the nation. In two short years, the Mount Pleasant Arts Innovation Zone has drawn the attention of NASA, Discovery Education, and other businesses and corporations looking for graduates with 21st-century skills.

"Dr. Jackson has a clear vision of what STEAM should look like. He wants to do this, not just for the high school, but for all of the kids in Mount Pleasant," said Ryan Pastrana, who runs the filtration research and development center for Parker-Hannifin, a company specializing in motion and control technologies. "When we first met and he talked about this, he said, 'Since we don't know how to do it, we'll just invent it.' And he did. That impressed me."

#FullSTEAMahead

When Chris Marczak was hired as Maury County's superintendent in 2015, he came in with a sense of urgency and plans to shake things up. The district's previous superintendent had been a longtime administrator at Columbia Central High School before taking the top job, and the board wanted a change in leadership style. Bringing in someone who had never lived in the county made sense.

"In today's society, it's not about having a high school diploma," Marczak said. "It's about a bachelor's or the equivalent, whether that's an opportunity to enter the military, receive industry certification, get into a technical college or become a journeyman on the job. It's the training we must provide to students so they can make a living wage."

Finding a way to do that in this middle Tennessee county, rapidly becoming an exurb of Nashville, has presented a series of challenges due to geographic and economic diversity. A General Motors manufacturing plant in Spring Hill, Tennessee, is the county's largest employer, and much of the area's industry is focused on advanced manufacturing, transportation and logistics.

With approximately 80,000 residents, Maury County is made up of three cities: Spring Hill, Columbia and Mount Pleasant. Each city has its own middle school and high school, and the district operates three small K–12 schools in the unincorporated areas.

Contrast between the cities is striking. Columbia, the county seat, boasts a new $50-million, 1,370-student high school. Spring Hill, one of the fastest growing cities in the state, has just under 1,000 students at its Maury County high school. By contrast, Mount Pleasant has seen its enrollment steadily drop over the past three decades and educates fewer than 400 students in its high school, built in the 1960s.

Over a 10-week period in 2015, Marczak and board members met with community leaders, parents, students, teachers, civic organizations and other interest groups to develop the district's "Seven Keys to College and Career Readiness," a comprehensive, seven-step program that focuses on providing all students with access to Advanced Placement classes, dual enrollment and work-based learning opportunities.

Marczak has been relentless in promoting the district's accomplishments to anyone who will listen. In late February 2018, he held a lunch with local Realtors at Columbia Central, the district's new high school. The luncheon was the first of its kind for the district, and administrators from each school were set up in an adjoining room to provide the 40-plus real estate agents with information.

"We are moving fast," Marczak said. "But every time someone asks, 'Are we moving too fast too soon? Are we doing too much?', I remind them that, every 10 months, we're going to lose 800 students to graduation. We don't have the luxury of time."

Marczak said the school district's job is to "implement the strategies that further those seven keys because it's incumbent on us to give the community what they asked for." One thing he heard loud and clear was the need for more career and technical education (CTE) opportunities.

"A lot of industry is coming this way, and they need STEM-minded folks who can work their lines," said Lori Brown, the district's career and technical education supervisor. "The biggest change for us is that we're looking at the needs of our district and of the industry moving into the area; we need to make sure that we are building a strong workforce to meet those needs."

In 2016–17, Maury County added 15 new CTE programs, and now has 54 teachers working in 16 career clusters. The district offers STEM programs, and all three high schools have mechatronics programs, which combines mechanical engineering and electronics. A large number of the county's graduates also work in the surrounding counties, most of which are rural and don't have the same level of CTE infrastructure, officials say.

"The board has been supportive, and industry has been supportive, and we're doing everything we can to shake the trees out there," Brown said.

Bringing New Life to Mount Pleasant

Something needed to be shaken up in Mount Pleasant, a once-thriving community that dubbed itself the "phosphate capital of the world." By the early 1990s, the phosphate was gone and the industries that were its economic engine left the town a shell of itself.

"The residents of Mount Pleasant just hung their heads," said Donna Morency, executive director of the town's Community Development Corporation and a Maury County school board member. "They

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weren't proud of living in Mount Pleasant. Their kids weren't proud of going to school here. If I heard it once, I heard it a zillion times, 'It's old Mount Pleasant, what do you expect?'"

Marczak knew he needed to make a statement, so he looked to Nashville's Maplewood High School, where Jackson worked as an assistant principal in charge of the Academy of Energy & Power. Jackson had been an English teacher at the school before moving into administration, where he focused on STEAM initiatives, dual enrollment and project-based learning.

"I brought him down here and asked him about starting a STEAM high school in Mount Pleasant, and before the conversation ended, he was asking why we couldn't do something K–12," Marczak said.

Jackson, a self-described showman, said he was making a bold move. But he also knew he had an opportunity to make a difference.

"Kids are looking for something different. They're always looking for something different and experimental," he said. "They want somebody and something they can relate to. That's the reason my hair is long and I wear bracelets on my wrists, because the kids relate to that and they relate to me. Once they can relate, then they can learn."

In September 2016, the district officially launched its STEAM initiative. Eight months later, the district held a STEAM education summit featuring experiments, demonstrations by area industry experts and talks from NASA engineers.

Ryan Jackson stands in the classroom that will be renovated into Mount Pleasant High School's mechatronics laboratory.

Armin L. Begtrup, director of K–12 STEM programming and the mechatronics instructor, said the program has quadrupled its growth.

"The first year was all about culture, changing the mindset of the people," Begtrup said. "We've put a CTE teacher at the elementary and middle school in an effort to vertically align a lot of the programming, because we want to have a continuous strand that gives all students the skills and knowledge they need to achieve their goals."

Since then, a new dual enrollment program was launched that allows students to obtain an associate degree in mechatronics. In an aquaponics program, students are growing vegetables on the second floor of a redesigned classroom. Meanwhile, NASA selected Mount Pleasant to participate in its High School Students United with NASA to Create Hardware (HUNCH) program. Over the next five years, students will design and build prototypes for tools to be used on the International Space Station.

STEAM Success

As Jackson and Morency strolled through the empty Mount Pleasant High School, Jackson pointed to murals the students have painted since he arrived and shows off the set pieces — including a cannon — that metal trades students are making for a grades seven through 12 production of *Les Miserables*. He pointed to Mount Pleasant's tagline, "Courage to Create," and called it his "favorite hashtag."

"I wanted them to have the courage to step out on a ledge, take a risk and put themselves out there," Jackson said. "I don't sell the steak; I sell the sizzle. I know how to seal a deal and sell a partnership, but what I really know how to do is inspire and connect with students. That's my strong suit. Once I get the kids, then I get the parents and the community and progress comes from that."

Morency says the hiring of Jackson, and the subsequent rollout of the STEAM initiative, was exactly the shot in the arm the community needed.

"You know you've made it when Dollar General makes T-shirts with 'The Mount' on them, because never before would anyone wear a shirt that said they were from Mount Pleasant," Morency remarked. "But this is the heart of the community. The whole community has rallied around these schools and this STEAM initiative."

Jackson and Morency walked into a classroom that will be renovated into the mechatronics lab, thanks to a $500,000 grant from the Clark Legacy Foundation. The money came as a surprise; the foundation was disbanding after its parent company, Clarcor, was purchased by Parker-Hannifin and Pastrana urged Jackson to apply.

"I thought we could get $10,000," Jackson said. "I didn't expect the whole thing."

Pastrana said the foundation's board was impressed by the school's inclusion of

> "They want somebody and something they can relate to," Jackson said. "That's the reason my hair is long and I wear bracelets on my wrists, because the kids relate to that and they relate to me. Once they can relate, then they can learn."

the arts in its STEM curriculum "because of the opportunities it gives students to have a well-rounded education." But after a visit to the school, they also were impressed by its leadership.

"I had to give a presentation to the trustees, and one of them came to see what they are doing here," Pastrana said. "The trustee said, Mr. Jackson is the type of person they make movies about, and I couldn't agree more."

With all of this acclaim and attention, Jackson already is receiving job offers to move elsewhere. But he says he's not interested in leaving Mount Pleasant.

"People leave when they're unhappy," he said. "There is so much work to do here. I moved my family down here from Nashville and we're right in the middle of it. Fortune favors the bold. We've taken this bold risk and now it's paying off. I believe that we're truly at the beginning of something amazing, and I want to see it through." ■

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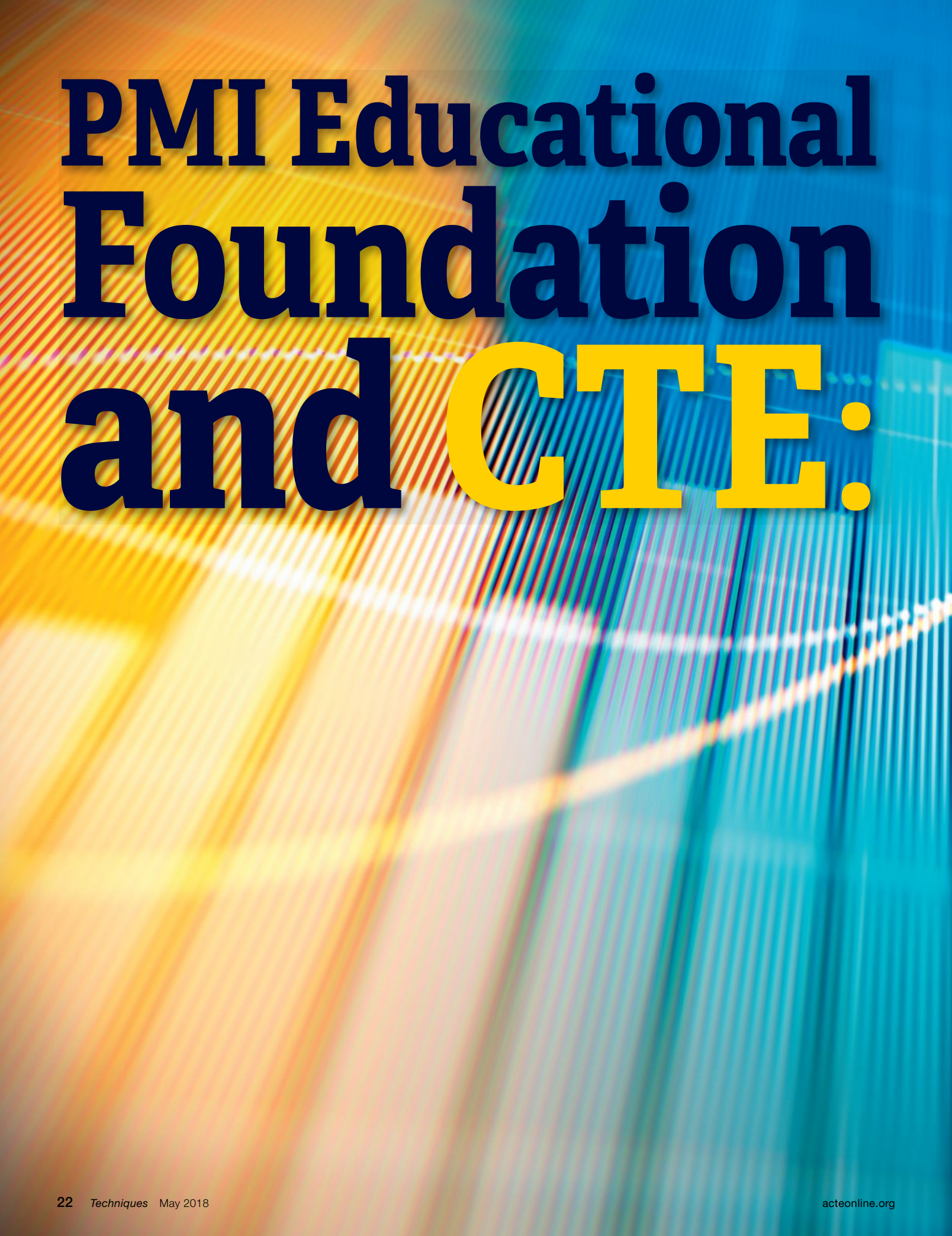
PMI Educational Foundation and CTE:



How Smart Investments Pay Off

By Michelle Armstrong

The world — like the career and technical education (CTE) teacher's classroom — runs on projects that must be managed effectively and efficiently. Projects, after all, should drive productivity, on schedule and on budget, while mitigating risks as best as possible. For nearly half a century, the Project Management Institute (PMI) has enabled business and industry to problem-solve some of the world's most pressing challenges through its global standards that advance professional excellence. That said, the Project Management Institute Educational Foundation (PMIEF), the philanthropic arm of PMI, recognizes the imperative to integrate project management into secondary school curricula to strengthen teaching and learning. This is because PMIEF strives to ensure young people graduate high school ready for college and career.

Without question, the 21st century world of work demands that people know how to collaborate with others, to unravel conundrums and to think outside of the proverbial box. Ask any project manager and they will attest the profession is predicated on these competencies. This is why the foundation's commitment to prepare what it terms Project Management (PM) Knowledgeable Youth drives much of its philanthropy, including through grants to high-quality nonprofit organizations that share this goal. Rather than simply encourage young people to ponder their future careers, CTE classes equip them with the practical and relevant skills they need to succeed in the workforce. These courses are decidedly project-based, which is why integrating project management into these curricula simply makes sense. Still, frequent oversight of the intrinsic connection between CTE and project management is why PMIEF has thoughtfully invested in CTE initiatives since 2013, collecting data from those closest to the classroom to inform its funding decisions.

Why It Matters

Any sound investment requires, first, understanding the market. When it comes to today's youth, the market demands high school graduates who are intellectually curious, who boldly reimagine the norm and view problems as projects. In other words, the market demands high school graduates who embody the attributes of project management.

PMIEF knows this. A 2013 PMI talent gap analysis discussed cultivating professionals' leadership skills as well as business and strategic management abilities — all project management competencies — to help drive organizational performance and alignment with organizational strategy. Furthermore, PMI (2017) expects employers will need 87.7 million individuals to fill project management-related roles by 2027. Job openings will be particularly prevalent in project-intensive industries (i.e., those in which occupational employment requires a high level of project-oriented work, including business services, finance and insurance, information services and manufacturing).

Preparing today's students for tomorrow requires engaging them in real-world, project-based learning. This enables the development of experiential knowledge as they begin to see how their lessons learned can light the path they will eventually pursue. Concurrently, CTE students deepen their realization that, one day in the not-too-distant future, they will be expected to manage projects with significant consequences for the world in which they live.

A Data-driven Decision

For PMIEF, philanthropy weds altruism and pragmatism to yield measurable results. Founded in 1990, the foundation approaches its work by examining the issues and identifying the right partners to help address them.

The decision to invest strategically in CTE followed an in-depth study the foundation commissioned MBA Research and Curriculum Center to lead to gauge states' interest in integrating project management into their CTE curricula. MBA analyzed each state's department of education website and conducted telephone interviews with more than 40 state CTE leaders (as well as a CTE leader in New York City) over a six-month period from 2013 to 2014. Inquiries explored the extent to which curricula currently integrated project management and plans for this going forward, careers clusters by state, CTE participation levels, and student demographic data. In addition, MBA convened focus groups in four cities with teachers representing 11 states and students representing 10 states. The organization also interviewed secondary school counselors, college admissions staff and human resources professionals across the U.S. to ascertain their perceived value of project management.

Some states, like North Carolina, had already begun to design project management-rich CTE classes for students; others had not previously linked CTE and project management and lacked necessary resources to revise CTE curricula in the near term. Teachers also lacked project management know-how despite the numerous projects they implemented each year. Some questioned the age appropriate nature of project management instructional resources and what time commitment they faced if required to familiarize themselves with those resources (Osteen & Crosby, 2014).

The foundation knows the power of collaboration, and it works both with and through others to effect change. This approach to its work and the data MBA gleaned inspired PMIEF's next steps. It would not only create its own resources to help facilitate CTE teachers' project management instruction, but it would also enable visionary partners to develop and to take similar resources into classrooms across the country (and the world).

Educational Resources

Following the study, PMIEF and MBA further partnered to develop a trio of no-cost, educational resources to support CTE teachers' instruction. *Project Management for Career and Technical Education* complements traditional CTE coursework by offering three projects each for secondary school business, finance and marketing classes. The projects allow students to create connections between school and the careers they may ultimately choose in business-related professions. Furthermore, they acquire and thoughtfully apply project management knowledge as they engage with these curricula, including how to develop a project charter, to define a scope statement, and to create plans that help ensure quality and risk management. The curricula also encourage students to perform self- and peer-assessment, and to reflect on what they have learned.

A 2015 PMIEF grant to MBA funded the organization to pilot the resources in CTE

> "The projects allow students to create connections between school and the careers they may ultimately choose in business-related professions."

classrooms in 27 states across the U.S. MBA selected 67 teachers — 21 business teachers, 21 finance teachers and 25 marketing teachers — who applied to participate in the pilot, delivering in-person training before the start of the 2015–16 school year. In addition to the training and ongoing coaching, teachers received funds to purchase supplies and materials to help them integrate project management into their curricula as well as a modest stipend for participation.

The teachers selected represented career and technical education centers and comprehensive high schools in urban, suburban and rural settings. Some were new to the profession while others were teaching veterans. Participants' knowledge of project management and project-based learning also varied. Moreover, MBA ensured the number of teachers per state was proportional to the number of applicants from each state.

An external evaluation of the pilot by TCC Group permitted in-depth understanding of the implementation, usage, perception and impact of the resources and grant-funded activities. The evaluation revealed both teachers and students developed project management competencies during the pilot:

- 91 percent of teachers could describe what occurs during each project management process group post-training versus 35 percent pre-training
- 78 percent of teachers felt "very comfortable" integrating project management into their classes post-training versus 41 percent pre-training
- 93 percent of teachers said they intended to use PMIEF's CTE resources ongoing in their instruction
- 75 percent of students either "agreed" or "strongly agreed" when asked if the resources proved very helpful in putting classroom lessons into action
- Teachers described the pilot as "a wonderful experience" and reported feeling "very comfortable implementing project management" into their classes
- Pilot students consistently reported more project manager-like behaviors (e.g., delegating responsibilities, maintaining a schedule, defining project goals and outcomes, and tracking project progress) than non-pilot students (Gasper, Frantzen & Konecky, 2017)

Bang for the Buck

PMIEF's commitment to CTE goes beyond its pilot of *Project Management for Career and Technical Education*; it has provided support for other organizations to innovate project management-rich initiatives. While its partnership with MBA centered largely on the usability of CTE resources, additional grants support leading nonprofits equally committed to enhancing education by integrating project management.

For example, PMIEF awarded a two-year grant to Asia Society in 2015 for Global Competence through Career and Technical Education, an initiative its Center for Global Education developed and delivered in conjunction with ACTE and Advance CTE. Asia Society sought to raise CTE stakeholders' capacity to understand and to act on issues of global significance as they prepare students to meet the demands of 21st-century careers. It also aimed to inform teachers and students about the kinds of global careers that exist in CTE pathways while helping teachers integrate project management into their career exploration and classroom projects.

PMIEF's grant allowed Asia Society to create and to pilot a customizable, 12-hour, online video course with two modules and an accompanying toolkit for U.S. middle and secondary school CTE teachers. Forty teachers participated in the pilot and lauded it for its robust content and applicability to their instruction. Survey findings revealed:

- 97 percent of teachers either "agreed" or "somewhat agreed" the course and toolkit will support their CTE project instruction
- 97 percent of teachers either "agreed" or "somewhat agreed" the initiatives proved valuable to their professional practice
- 87 percent of teachers described PMIEF's *Project Management Toolkit for Teachers* (another of the foundation's educational resources) as either "extremely useful" or "very useful"
- 97 percent of teachers either "agreed" or "somewhat agreed" they understood how to integrate a global focus into a lesson without needing to be an expert on global issues

PMIEF and Asia Society are presently collaborating to pilot Global Competence through Career and Technical Education with CTE teachers in Asia Pacific. In addition, a second grant will allow Asia Society to create and to pilot a new online course and an accompany-

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ing toolkit of STEM-related pathways to help bridge the pervasive skills gap.

While teacher training is at the forefront of much of PMIEF's work, the foundation knows the critical role CTE administrators play in the design and delivery of professional development to CTE teachers. For this, it awarded a 2016 grant to ACTE for CORE-101 Administrator. The grant funds ACTE to develop an online video course and an accompanying handbook to help CTE administrators build their instructional leadership capacity to strengthen CTE teachers' project-based learning instruction through project management. Several sessions at ACTE's CareerTech VISION 2017 showcased this two-year grant, including sessions by Dr. Michelle Conrad and Dr. Larae Watkins of the University of Central Missouri.

Conrad and Watkins work closely with ACTE on this initiative, including to co-create and validate a CTE administrator self-efficacy scale. Dr. Kemaly Parr of Murray State University, the grant's evaluator, helped validate the scale and will use subscales to assess this initiative. Dr. Howard Gordon of the University of Nevada, Las Vegas, as well as Dr. David Yost and Dr. Brenda Tuckwiller of West Virginia University also helped validate the scale.

CORE-101 Administrator has already generated significant attention because CTE administrators must become project management proficient. In fact, the Louisiana Department of Education plans to include the grant-funded ACTE course in its CTE Leaders Academy curriculum.

Reflections and Takeaways

The 21st-century workforce demands the competencies inherent to project management, especially in the careers CTE students frequently enter. For PMIEF, equally important to helping students learn through projects is helping them learn how to manage those projects. CTE teachers, too, must come to appreciate the value project management can add to their pedagogy.

Teachers must understand project management if they are to integrate it into their curricula. Overlooking this truth is like that old adage about putting the cart before the horse: Educators will experience frustration as they try to teach what they don't fully understand because they will struggle to recognize its relevance to their instruction. This is why PMIEF and its grant-funded partners develop educational resources and materials that are simple yet didactic. That said, eye-catching videos, content-rich toolkits and feasible sample projects to execute with students make it easier (and frankly, more enjoyable) for teachers to not only learn project management, but also to transfer that learning to their students.

The foundation leverages the expertise of organizations like MBA, Asia Society and ACTE that, through its grant support, raise the bar when it comes to making a difference in education. It does so because the proven positives borne out of the collective efforts of many always outpace the progress PMIEF can make on its own. Even as John Donne posited that no man is an island, PMIEF relies on its outstanding partners and the results their grant-funded initiatives yield to inform where to direct its dollars. CTE has proven a high return on investment and the foundation expects it will continue to do so in the years to come. ■

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EXPLORE

A trio of educational resources available from PMIEF may be found online: **www.pmief.org**

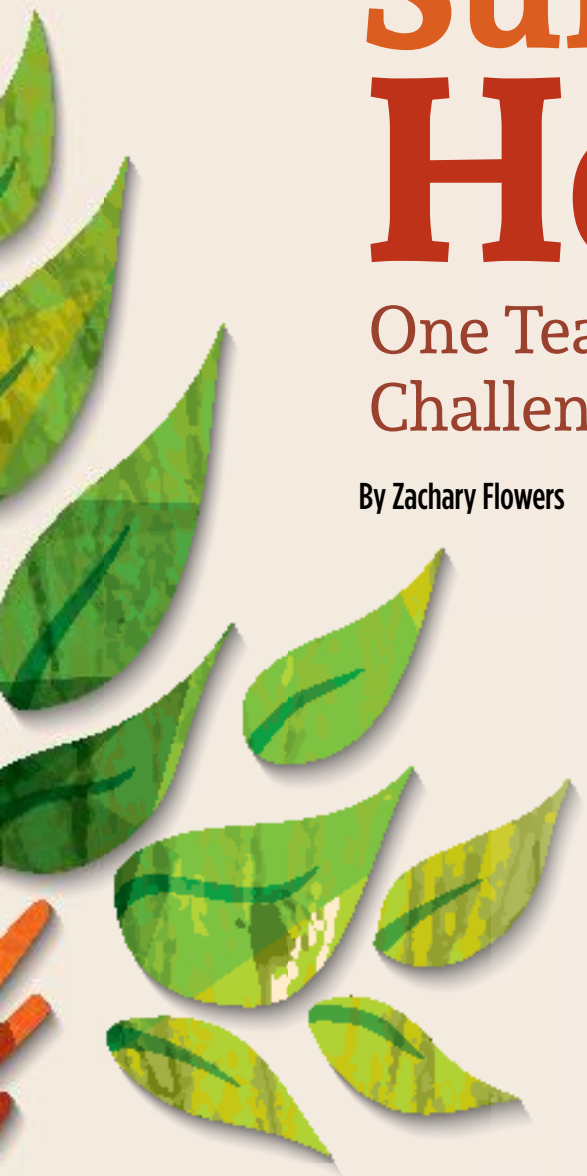
Global Competence Through CTE: **www.acteonline.org/globalcourse**

Global CTE Toolkit: **https://asiasociety.org/education/global-cte-toolkit**

Survival on the Horizon:

One Teacher's Story of Overcoming Challenges to Achieve Success

By Zachary Flowers



How does one become a successful teacher? Are they born into it? Do they happen to take enough of the right classes and get lucky? Does becoming a successful teacher take a lot of work, dedication and continued education? These are all questions I, Zachary Flowers, have asked myself more than once. I am about to begin my third year of teaching for a small high school on an Indian reservation in New Mexico, and sometimes I wonder if I will ever get out of the survival mode that most new teachers experience. The only thing I know at this point is that meeting and learning from others in my field can only help me to be more successful in my future endeavors.

My decision to become an agriculture teacher came as a surprise to family and friends, to be sure, and it even caught me off guard. While in college, I changed my major 12 different times. I thought I wanted to go into business management, then criminal justice, then veterinary school, and the list goes on; I never contemplated the idea of teaching.

Zachary Flowers Sr. and his 11-year-old son Zachary Flowers Jr. stand near one large piece of equipment used at the Tyrone Copper Mine, outside of Silver City, New Mexico.

Prior to the beginning of my final semester at New Mexico State University (NMSU), I learned that I could obtain an alternative license and begin teaching immediately; the thought of a steady paycheck sounded very appealing at the time. I took the necessary steps to acquire my alternative teaching license and even found an open teaching position just 50 miles from home. Things were working in my favor, but I am reminded of Newton's third law: "For every action, there is an equal and opposite reaction."

Overcoming Challenges

Choosing to skip the student teaching experience has not come without its consequences. Designed to act as a safety net, the cooperating teacher allows the student teacher to take over full responsibility for the classroom a little at a time. If, and more certainly when the student teacher becomes overwhelmed or runs into problems, the cooperating teacher is there to guide them. The student teacher learns classroom management techniques, lesson planning, and how to get through an actual school day, week and semester.

I did not receive any of this guidance; rather, I took on a full school load on day one. Aug. 4, 2015, was the beginning of my baptism by fire. While I was excited to begin this journey, an ever-present fear loomed in the background. What am I doing? Are these people really going to trust me with six classes a day? How am I going to handle six classes a day? What if my lessons run too short? What if the students don't like me? What if they don't listen to me? I was more than just a little scared. Then I met David Bennett.

Through Mentorship

Bennett was the welding teacher and worked down the hall from my new classroom. He and I got along immediately; Bennett retired from teaching in Texas where he taught at both the high school and college levels. His experience was invaluable for me. While he couldn't replicate the relationship I might have had with a cooperating teacher, he was the next best thing. I could talk to him during prep hours, in between classes, and before or after school. We even served the same duty schedules, which allowed for more collaboration. But was it enough?

During the summer of 2016, I received a phone call from Tre Easterly, assistant professor with the department of agricultural and extension education at New Mexico State University, regarding the New Mexico Teacher Induction Program (TIP). TIP is a support program that pairs new teachers with mentor teachers. Similar to student teaching, the program offers cooperative relationships between new and veteran teachers, to bounce ideas and ask for help. I was paired with a teacher located just 30 minutes away, offering me the opportunity to call my mentor teacher or drive to their school when I need something.

My mentor has invited me to observe classroom management techniques; we have spoken on the phone about new instructional units with which I was not familiar, and we have even partnered on a collaborative project for NMSU. When asked to address a group of students about to begin their student teaching experience, we spoke about classroom management and our own approach. This collaborative project required me to take a long hard look at my classroom management philosophy, when I quickly realized I did not have a classroom management philosophy worth sharing. To prepare, I read books, spoke with colleagues and scheduled time to speak with my school administrator. Soon, I found myself implementing new classroom management practices and found my daily classes to be far less stressful. With guidance and support from David Bennett, Tre Easterly and TIP, I have made tremendous gains as a teacher.

Through Networking

The New Mexico Agricultural Teacher Conference is an annual event sponsored by the New Mexico Agricultural Education Teachers Association (NMAETA). I first attended in 2015, while in the teaching program at New Mexico State University. NMSU students and student teachers, as well as agriculture teachers from around the state attended, where days were spent enhancing skills and gathering ideas for projects to take back to the classroom.

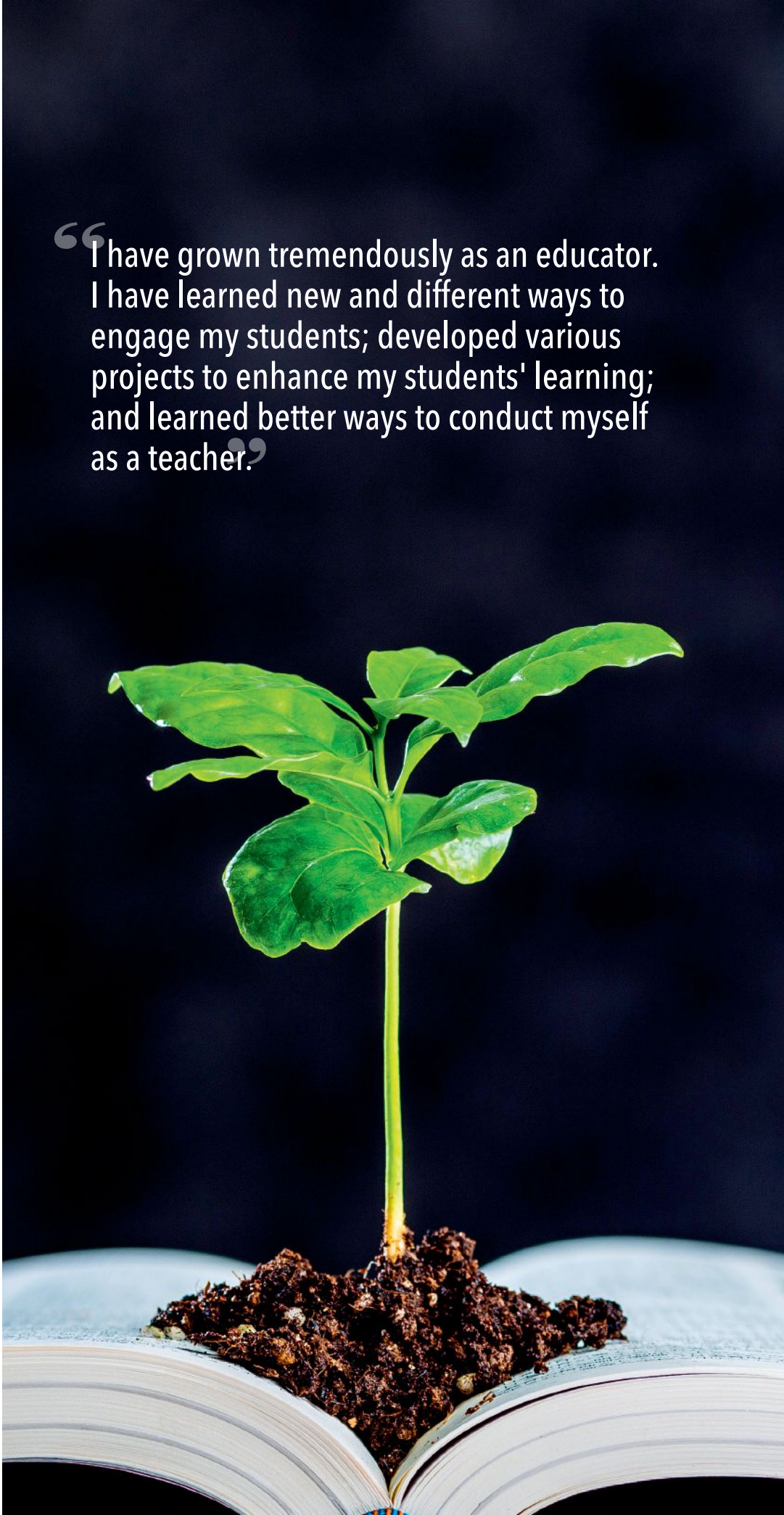
In June 2017, I attended the New Mexico Agricultural Teacher Conference for the third time. I took the first day of the conference to hone welding skills and to gain experience with new equipment on the market. I had the added opportunity to speak with industry-leading welders about how they support school teachers and their programs; we discussed training programs and options for purchasing consumable welding supplies at pennies on the dollar. If there is an agricultural teacher out there without budget limitations, I would like to meet them! Cost savings gained through networking at conferences can be vitally important.

The second and third days involved local tours. We visited a local fish hatchery that supports a large portion of the New Mexico fishing population and provides schools with hatchlings to grow. What I enjoyed the most about this tour was the demonstration to conference attendees how to be successful on a budget. We learned how to make a large-scale, automatic fish feeder for under $50 and how to build a water filtration system with nothing more than a few buckets and some plastic pieces.

A subsequent tour of the Tyrone Copper Mine in Silver City, New Mexico, inspired new ways to get students interested in industrial careers. Attendees were introduced to the entire production process, from the pits where copper is mined to the lab with a discussion of how the soil is chemically treated and how the copper is taken from the solution and turned into large plates. These tours opened my eyes to a lot of great opportunities that are readily available to my students, right here in their home state.

Through my attendance at NMAETA's annual event, I have met a lot of different teachers from all around the state. Some might call it a character flaw, but I do not like to ask for help. As I become friends and develop relationships with my colleagues, it is easier to pick up the phone and ask.

"I have grown tremendously as an educator. I have learned new and different ways to engage my students; developed various projects to enhance my students' learning; and learned better ways to conduct myself as a teacher."



Achieving Success

Between the assistance from my unofficial cooperating teacher, the teacher induction program and attendance at the New Mexico Agricultural Teacher Conference, I have grown tremendously as an educator. I have learned new and different ways to engage my students; developed various projects to enhance my students' learning; and learned better ways to conduct myself as a teacher. I made the decision to skip student teaching on my own accord and can blame only myself if I fail.

When I look at the support system that I have, I do not see failure in my future, but success. David Bennett is proof that other teachers want to see me succeed and are willing to help me help myself. TIP is proof that NMSU is standing behind me, and willing to offer assistance as needed. The NMAETA event shows that not only do other teachers want to see me succeed, but so does the business community. Leading welders and industry suppliers showed me they are just as dedicated to educator support as they are to product promotion. NMAETA takes the time to put together a conference that is not only informational, but it also reminds teachers that they are not alone in their teaching endeavors.

I wish I had some deep words of wisdom for those new teachers who are getting ready to start their exciting careers. Sadly, I do not. What I can say is this: Do not hide in your classroom and expect to conquer the world on your own. Find a fellow teacher that you respect and learn from them. Find a professional organization and become active. Go to conferences and events; meet fellow teachers in your field; and do not be afraid to call on them. You will be surprised at how close you can become with someone who does not share the same zip code. Last, if your alma mater offers a program like NMSU's teacher induction program, take advantage to its fullest extent. These invaluable resources can make all the difference in the world when it comes to surviving your first few years of teaching; they did for me. Good luck and remember that, for every student that gives their teacher a hard time, there are 100 professionals who want to help that teacher succeed. ■

Zachary Flowers is is the agriculture, automotive, welding and woods instructor for Mescalero Apache Schools in Mescalero, New Mexico. Flowers received an undergraduate degree from New Mexico State University (NMSU) in 2015 and expects to complete a graduate degree at NSMU in May 2018. Email him at zflowers@mescaleroas.org.

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Sweet Success at Milton Hershey School

By Dave Curry

Career and technical education (CTE) has been engrained in Milton Hershey School's (MHS) history for more than 100 years. The school was founded and established by Milton Hershey, chocolate magnate and entrepreneur, and his wife Catherine in 1909 to help orphaned boys. Today, the school currently provides a cost-free education and nurturing home life year-round to more than 2,000 boys and girls, in grades pre-K through 12, from low-income backgrounds at its residential campus in Hershey, Pennsylvania.

Milton Hershey often described his vision for the school, "The main objective in view is to train young men and women to useful trades and occupations, so that they can earn their own livelihood." With deep connections to the past and innovative networks to the future, the school is unwavering in its commitment to CTE. Why?

For students growing up in poverty, opportunity often feels out of reach. Students 16–24 years old from low-income families are seven times more likely to drop out than students from higher income families (Chapman, Laird, Ifill, & KewelRamani, 2011). Career and technical education, breaks down some of the barriers to opportunity. CTE allows these students to discover their unique talents and passions at a young age and begin creating their own definitions of success.

Combine a child's passion and abilities with a caring, dedicated community of adults, and success becomes tangible. Milton Hershey School prepares disadvantaged students for 21st century careers.

A Foundation in Hands-on Learning

Milton Hershey's commitment to hands-on learning has guided the school as it developed a comprehensive CTE program.

Beginning in both the elementary and middle school levels, MHS students are exposed to career concentrations through career fairs and skills-based learning opportunities. When students enter high school, they explore 11 different career pathways before choosing one to study for the remainder of their high school career.

- Agriculture and natural resources
- Automotive technology
- Business/financial management and accounting
- Computer science and innovation
- Construction/carpentry
- Culinary arts/restaurant management services
- Electronic media and journalism
- Engineering and design
- Graphic communication technologies
- Health science
- Law, public safety and security

Within each pathway, students have access to specialized classes, professional workplace learning experiences and industry-recognized certification opportunities. To ensure the curriculum reflects the needs of local and nationwide employers, the school established advisory committees. MHS advisory committees include representatives from local industry, in each career pathway, to ensure the school's curriculum, certifications and workplace experiences meet high standards for students today and in the future.

With nearly 90 certifications offered, students are mastering the technical skills employers seek in the 21st-century workforce. In the classes of 2012 to 2017,

Milton Hershey School students in the construction and carpentry career pathway spend the school year constructing a home on campus.

100 percent of seniors at Milton Hershey School earned at least one industry-recognized certification before graduation.

For students like Jared Ross, an MHS senior who enrolled at the school in eighth grade, these certifications not only build technical skills but they allow students to explore their wide array of interests and challenge themselves with new responsibilities.

"I didn't grow up with a father around, so I kind of looked to television for male role models," said Ross. "I looked at superheroes like Tony Stark who built himself into who he is now through entrepreneurship."

With the goal of becoming an entrepreneur himself, CTE has brought his childhood dreams to life. The curriculum and certifications have allowed him to pursue his passions for art, business and technology. Ross received the IC3 Digital Literacy certification in the school's computer science and innovation pathway before successfully completing certification exams for Adobe Photoshop, Illustrator and InDesign in the graphic communication technologies pathway.

Now, during his last few months of high school, Ross is working toward a certification in Adobe Premiere through the MHS electronic media and journalism pathway.

"I like responsibility because I've watched how the entrepreneurs before me operate. I feel like [these CTE opportunities] are preparing me for what I can do for the world," Ross said. "I have interests in so many things, and I want to have experience in all of them."

Many students, especially those from impoverished backgrounds, struggle to find role models who exemplify their definition of success. They might be a first-generation college student with entrepreneurial aspirations, or a female carpentry student pursuing a line of work that is unfamiliar to her family. Career and technical education can provide these students with access to opportunities rooted in skill-building and career preparation, giving them the knowledge and confidence to pursue their goals.

Access to Opportunity

To prepare students for the 21st century workforce, effective CTE curriculum must combine technical knowledge with employability skills that introduce students to the professional workplace.

Early Exposure Programming

To help students consider purposeful careers beginning as early as elementary school, early exposure programming makes CTE a natural part of the school curriculum.

Milton Hershey School's commitment to CTE starts in elementary school and carries students through high school, where they must complete a four-credit CTE requirement prior to graduation. All students in grades five through 12 receive CTE programming in some form every year.

Through elementary career fairs, MHS students research different industries and rotate through 11 stations that give them a glimpse inside the high school's career pathways. Thanks to hands-on activities, like an augmented reality sandbox, students gain an early understanding of various careers that prepare them for skills-based education in middle school.

Authentic Work Experiences

Through internships, co-op programs and pre-apprenticeships, students have the opportunity to work in an authentic work environment and learn directly from industry professionals. Authentic work experiences demonstrate for students what happens in a given career, in a real-world environment, and gives them an opportunity to implement what they have learned in the classroom.

Strong industry partnerships can take these authentic work experiences to the next level. Milton Hershey School has an affiliation with the Hershey, Pennsylvania, business community, which makes students' work experiences more relevant and meaningful. Through local industry partnerships, students feel more connected to their community and gain a deeper understanding of how they can contribute to the local workforce. Authentic work experiences also help students discover what aspects of a particular industry or career they might not like.

"CTE gives students a chance to explore something they may be interested in, and maybe they'll realize they aren't interested in it. They can use that information in their postsecondary pursuits," said Ross.

Whether students want to join the military, enter the world of work or pursue higher education, authentic work experiences allow them to discover their strengths in the field they hope to pursue in the very near future.

Technical Skill-building

Guest speakers, hands-on lessons and job shadowing opportunities are significant

aspects of CTE programming. These interactions give students more autonomy and independence, and their career goals begin to feel more real.

For example, in the construction and carpentry pathway at MHS, students spend the school year constructing a home on campus. In the school's engineering and design pathway, architects and engineers from local firms visit classes and describe their experience working with clients and creating designs. When students develop their skills by interacting with professionals and completing hands-on projects, they develop a stronger sense of purpose and motivation.

Industry-recognized Certifications

Teaching technical skills is an important part of CTE programming, but industry-recognized certification opportunities give students an additional advantage: an impressive résumé.

All students can earn state- and nationally recognized certifications that not only expose them to the skills needed in the field, but will allow them to build a résumé that will impress employers.

Within the school's 11 career pathways, students have 88 industry-recognized certification opportunities. For students like Jared Ross, these certifications provide a clearer understanding of how to market themselves.

Employability Skills

To complement technical skills and certifications, employability skills allow students to develop professional etiquette that is transferrable to nearly every career.

Educators infuse employability skills into the curriculum where it's appropriate basic etiquette lessons students may not receive at home or elsewhere, combine technical knowledge with employability skills, so students have all they need to be successful in their future work environment.

College Classes

College and AP-level classes enhance the CTE curriculum. Through individualized, advanced instruction taught by college professors, students can accelerate their college education, especially if they have their sights set on a highly competitive university. MHS offers nine college classes on campus through its CTE program.

Jared Ross, MHS senior, has entrepreneurial aspirations. Through the school's CTE program, he has received four certifications.

Milton Hershey School

Milton Hershey School began as a dream and vision shared by Hershey Chocolate Company Founder Milton S. Hershey and his wife Catherine (Kitty). Unable to have children of their own, Milton and Kitty decided to use their wealth to create a home and a school for orphaned boys. On Nov. 15, 1909, they signed the Deed of Trust establishing the Hershey Industrial School, renamed Milton Hershey School in 1951.

Today, Milton Hershey School thrives as a cost-free, private, coeducational home and school for more than 2,000 children from families of lower income. Milton Hershey School offers a positive, structured home life year-round and an excellent pre-kindergarten through 12th-grade education. The school focuses on building character and providing children with the skills necessary to be successful in all aspects of life.

In addition to a rigorous academic program, the school emphasizes college and career readiness for its students. Every high school student has the opportunity to accrue $90,000 in scholarship money for postsecondary education. About 85 percent of graduating seniors go on to college or trade school to further their education, and many are first-generation college-goers.

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Summer internships provide MHS students with the opportunity to work in an authentic work environment and learn directly from industry professionals.

"I'm taking my third college course on the MHS campus. They're definitely more challenging, but I feel like MHS students are taught how to handle it," Ross explained. "It teaches me how college professors operate and puts more autonomy and responsibility on me. It gives me a jumpstart."

The responsibility of managing college classes can build students' confidence and ability to embrace challenges. Opportunities to earn college credits are especially important for low-income students who may be first-generation college students, giving them the time and space to confirm if college is the right path.

Apprenticeships

For high-school students, pre-apprenticeships allow them to work in their desired trade or industry prior to graduation. Pre-apprenticeship programs have the potential to transform traditional academics and connect work-based learning experiences to a career directly after graduation. Students who complete a pre-apprenticeship have the opportunity to begin a full-time apprenticeship immediately after graduation, after fulfilling in-class and on-the-job training hours in high school.

For low-income students, pre-apprenticeship opportunities can help them discover fulfilling careers that allow them to achieve success even if they cannot afford postsecondary education.

Forward-thinking CTE Curriculum

Career and technical education gives students of all demographics access to opportunities that might have once felt unattainable. Along with technical skill-building and professional development, CTE teaches an even bigger lesson: the power of creating dreams.

"I understand I might be unreasonable in my ambitions, but I value that. I feel like it's my responsibility to get my ideas out there," Ross said.

What may seem unreasonable before is no longer inaccessible when students have the tools to embrace responsibility, knowledge-sharing and workplace learning. It is essential for CTE programs to stay up-to-date with industry trends and knowledge in order to maintain these possibilities and equip students with the best tools and resources.

Providing students with a forward-thinking CTE curriculum gives them more choice and voice in the classroom, and guides them as they become the individuals who will lead the 21st-century workforce. ■

Dave Curry the director of career and technical education at Milton Hershey School. Email him at curryd@mhs-pa.org.

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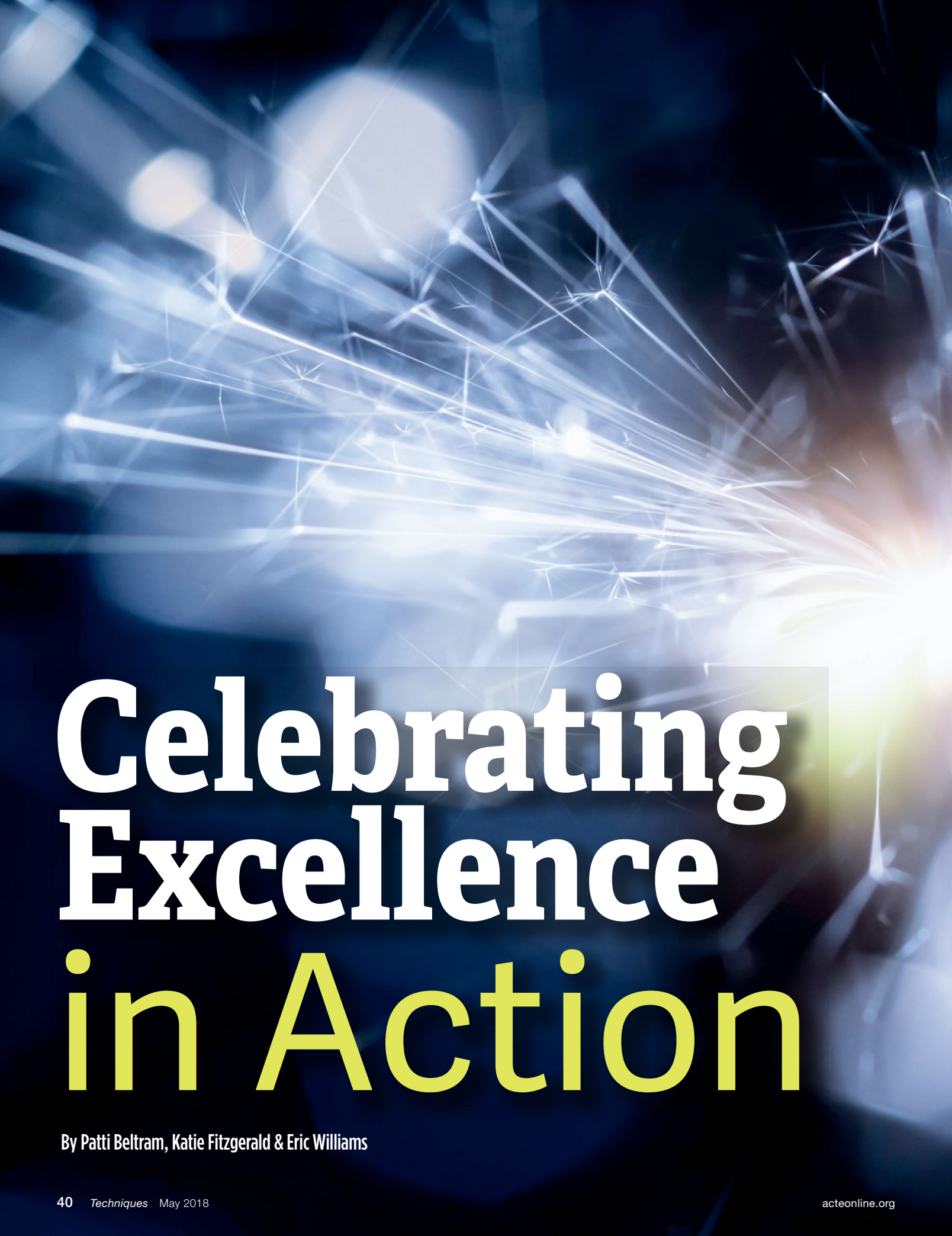
In the classes of 2012 to 2017, 100 percent of seniors at Milton Hershey School earned at least one certification before graduation.



Celebrating Excellence in Action

By Patti Beltram, Katie Fitzgerald & Eric Williams

Career and technical education (CTE) has made incredible strides in the last decade preparing students for in-demand, high-wage careers. CTE is no longer a terminal pathway for those 'other' students, but for all students, regardless of their future plans. Despite the gains made across the country, there is still work to be done to ensure that learners have access to high-quality CTE in every community across the nation.

Advance CTE, a national organization representing CTE state leaders, together with 12 organizations, including ACTE, developed *Putting Learner Success First: A Shared Vision for the Future of CTE* (2016) establishing a bold vision for all of education. The cornerstone for this vision is to challenge our community to commit to quality programs, while providing the leadership necessary to continue to re-examine, grow and transform CTE into a system that truly prepares all students for a lifetime of education and career success.

One way Advance CTE shines a spotlight on quality programs is through the annual Excellence in Action award. Launched in 2014, this award recognizes innovative and effective programs of study across 16 career clusters. To date, the award has honored 48 programs across 15 career clusters in 23 states.

Each application is vetted by a committee comprised of state CTE directors, past award winners and Advance CTE staff. Award recipients are selected based on a rigorous process examining the program's ability to set students up for education and career success by:

- Implementing career cluster-based programs of study
- Maintaining effective employer and business partnerships
- Demonstrating alignment to rigorous and relevant college- and career-ready expectations
- Demonstrating a clear progression of knowledge, skills and student transitions across secondary and postsecondary systems
- Integrating successful career guidance and advisement
- Integrating high-quality work-based learning experiences
- Highlighting alignment to workforce and employer needs in the community

Perhaps most importantly, these award-winning programs have concrete data to demonstrate the impact on student achievement and success at both the secondary and postsecondary levels.

Two honorees stand out in the award's five-year history: Arizona's Peoria Unified School District, a winner in 2016 for their early childhood education program, and in 2018 for their fire science program; and Jones County Junior College, a 2017 winner for their emergency medical technology program. Each demonstrates an unwavering commitment to improving and evolving the program of study to meet the needs of both learners and employers in their communities.

A Shared Commitment to High-quality Programs

A commitment to high-quality CTE is a commitment to only invest in, develop and implement programs that are held to the highest standards. This may require making tough choices, and helping to transform or even transition programs that aren't preparing learners for viable and in-demand careers.

The early childhood education program of study at Peoria Unified School District in Glendale, Arizona, reflects this dedication. What started as a home economics program focused on child care has evolved drastically into a robust program for future education professionals. In 2012, fewer than half of Arizona's children aged three to five were enrolled in nursery, preschool or kindergarten, compared to a 60 percent average nationwide ("High-quality," 2012). Through funding and support from the U.S. Department of Education's Rigorous Programs of Study grant, and in collaboration with the Arizona Department of Education and industry leaders, the program is now aligned with industry standards and offers opportunities to transfer credits seamlessly from secondary to two- and four-year colleges in an effort to recruit a future education workforce.

"This grant meant that we could explore the components that contribute to rigorous and quality instruction, and allowed us to develop a program that could be replicated nationwide," said Patti Beltram, director for career and technical education, Peoria Unified School District. "Now, all programs of study include dual enrollment and at least one industry certification. We are transforming the perceptions of CTE programs and how they help students gain skills, certifications and advancement in their programs."

Passionate, Dedicated Instructors

A critical component to implementing high-quality CTE is employers and industry leaders that remain engaged throughout the process. Employers at the state and local levels must play an active role to identify, develop and regularly review CTE programs of study. This includes validating standards and credentials, informing course development, and providing work-based learning experiences.

> "CTE means staying relevant with the changing dynamics of the job market. CTE means attracting new and innovated industries to the area. CTE means breaking the traditional paradigm of why students attend college. And, without risk of hyperbole, CTE means the future, said Williams."

Based on input from employers such as Bright Horizons, Valley of the Sun United Way and the Children's Learning Center, all of whom serve on the early childhood advisory council, Peoria Unified School District realized it was critical to align the program with the Child Development Associate (CDA) industry credential, and to provide opportunities for students to earn their fingerprint card, CPR/first aid and food-handling certificates — all of which are necessary to work in childhood education.

Along with industry-recognized credentials, all students participate in a laboratory experience as part of the child oriented occupational program (COOP), where they create lesson plans for four-year-old learners and help run an all-day, on-campus child care center. After students successfully complete their academic coursework, they can work in one of six COOP labs or for one of the industry partners.

The district's fire science program was started in 2004 to address the employment needs of the community and train future employees. Led by two active duty firefighters, all learners participate in work-based learning and a 100-hour internship, complemented by the knowledge and skills they gain in the classroom. Additionally, the program offers stackable credentials — college credit and various industry certifications — to provide students with a head start before applying to the Fire Science Academy at Peoria Unified District's Sunrise Mountain High School. Throughout the program, learners can earn up to six industry credentials and nine dual enrollment credits, paving a clear pathway from high school to Glendale Community College and/or Northern Arizona University.

Effective Postsecondary CTE Programs

Jones County Junior College is another exemplary program, and a model of successful engagement with employers. The emergency medical technical education (EMTE) program at Jones County Junior College (JCJC), located in rural Ellisville, Mississippi, involves industry in every aspect of their program, building the talent

pipeline in a community that has a critical shortage of qualified paramedics.

All EMTE students must complete clinical internships in the field. These internships consist of 500-plus hours of training under the direct guidance of a paramedic, registered nurse, physician, doctor of osteopathy or equally qualified health care provider. The clinical and field settings provide opportunities for students to begin to observe illnesses and injuries discussed in the classroom; develop and fine-tune diagnostic skills; and put together the overall picture of patient care. Critical to these work-based learning experiences are the highly skilled and knowledgeable experts, called preceptors, that lead field and clinical practica. Preceptors guide students during their internships, assist participants with medical and patient-care simulation tasks, and provide valuable input on current changes in the business of emergency medicine.

Through the course of the program, learners are evaluated on their mastery of skills by instructors, clinical preceptors and members of the advisory committee, comprised of nine ambulance services, three hospitals and the military installation at Camp Shelby, in Hattiesburg, Mississippi. The program relies on these experts to evaluate students' knowledge and skills and whether they exhibit ethical and moral behavior when providing patient care.

"CTE is a booming business in Mississippi and the southeastern United States. With a heavy increase in manufacturing, service and healthcare, the demand for skilled and certified technicians has never been higher," said Eric Williams, assistant director of emergency medical technology at Jones County Junior College. "To this end, it is our goal to provide CTE at the highest level to produce industry-ready, quality candidates to fill these careers. This is accomplished through partnerships with neighboring business stakeholders to give input, donate equipment or sponsor a class that fills the mutual needs of college and the community."

In 2016, JCJC learners clocked 1,400 hours of classroom instruction, had opportunities to earn more than seven industry-recognized credentials, and experienced a 100 percent job placement rate, demonstrating that, when a program is committed to setting high standards of quality, learners succeed.

Excellence Eradicates Stigma

Despite best efforts, there are still significant barriers to convincing learners and their parents that CTE is the right option. Lifting up high-quality programs of study and sharing them with critical stakeholders, such as the media, policymakers, employers and community leaders, allows us to demonstrate how important CTE is to our learners and employers across the nation. ■

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Eric Williams, MS, NR-P is the assistant director of emergency medical technology at Jones County Junior College. Email him at eric.williams@jcjc.edu.

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Learn more about the Excellence in Action awards, Peoria Unified School District, Jones County Junior College, the 46 award winners and how you can become an Excellence in Action award recipient at **www.careertech.org/excellence-action-award**.

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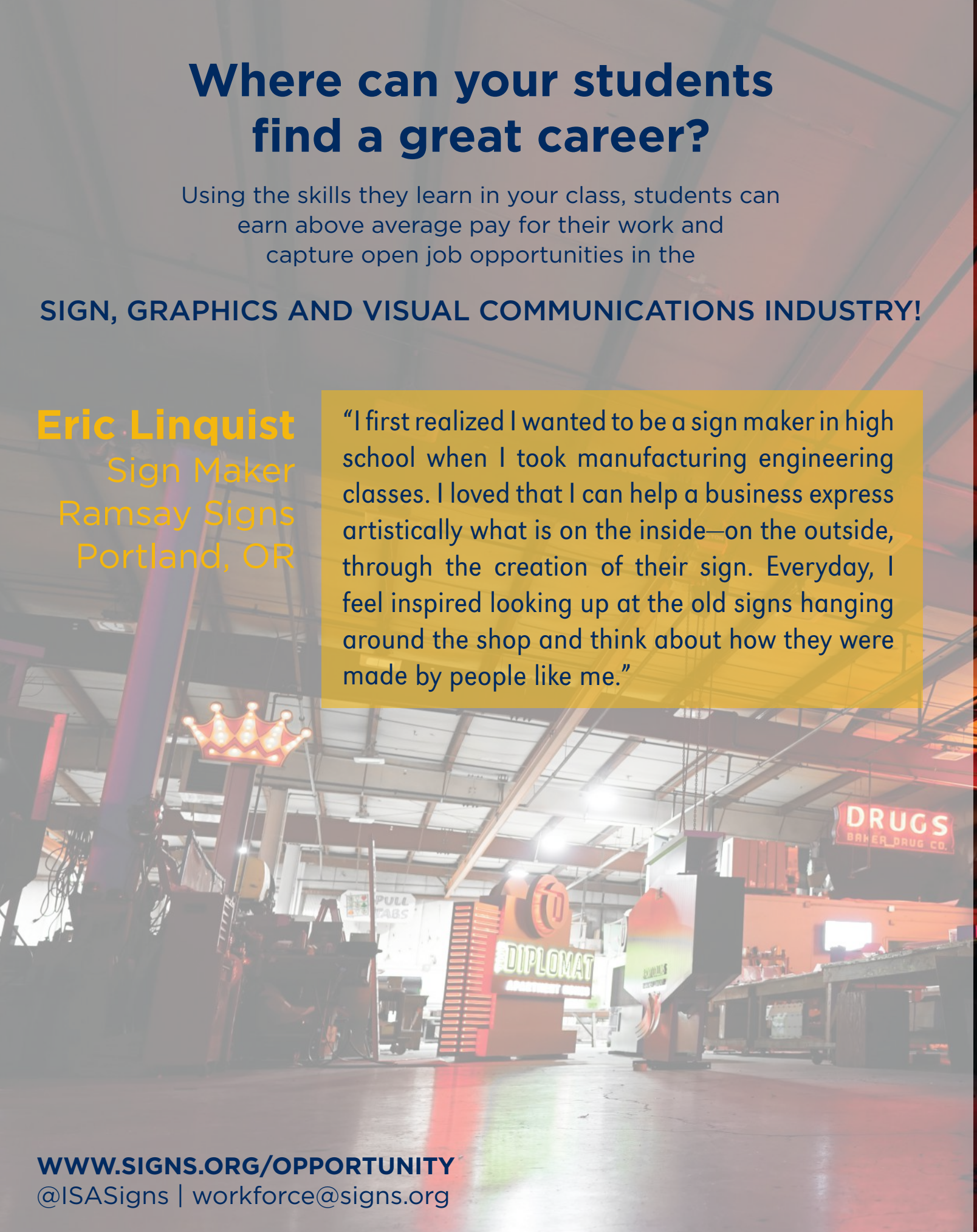

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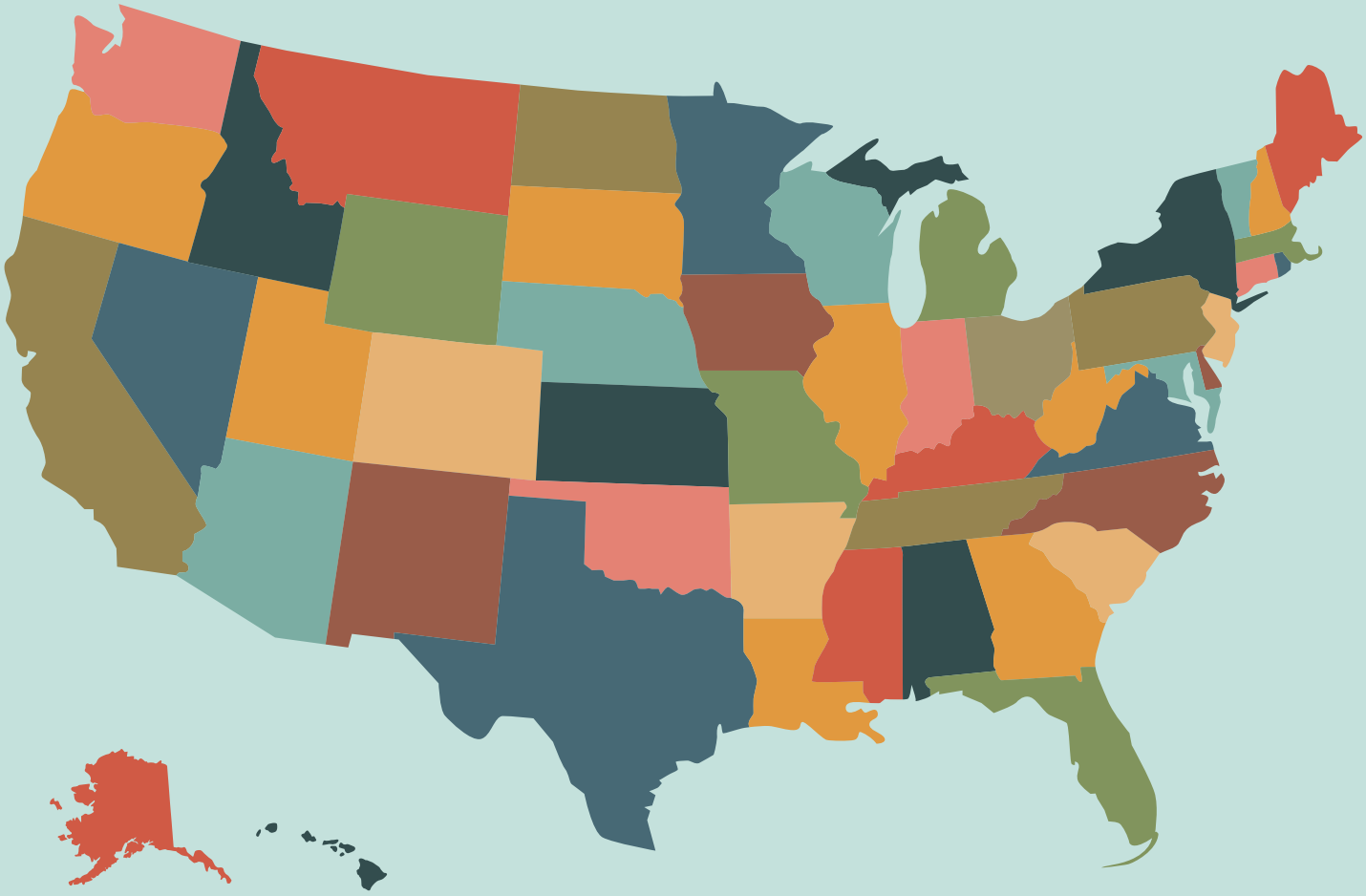


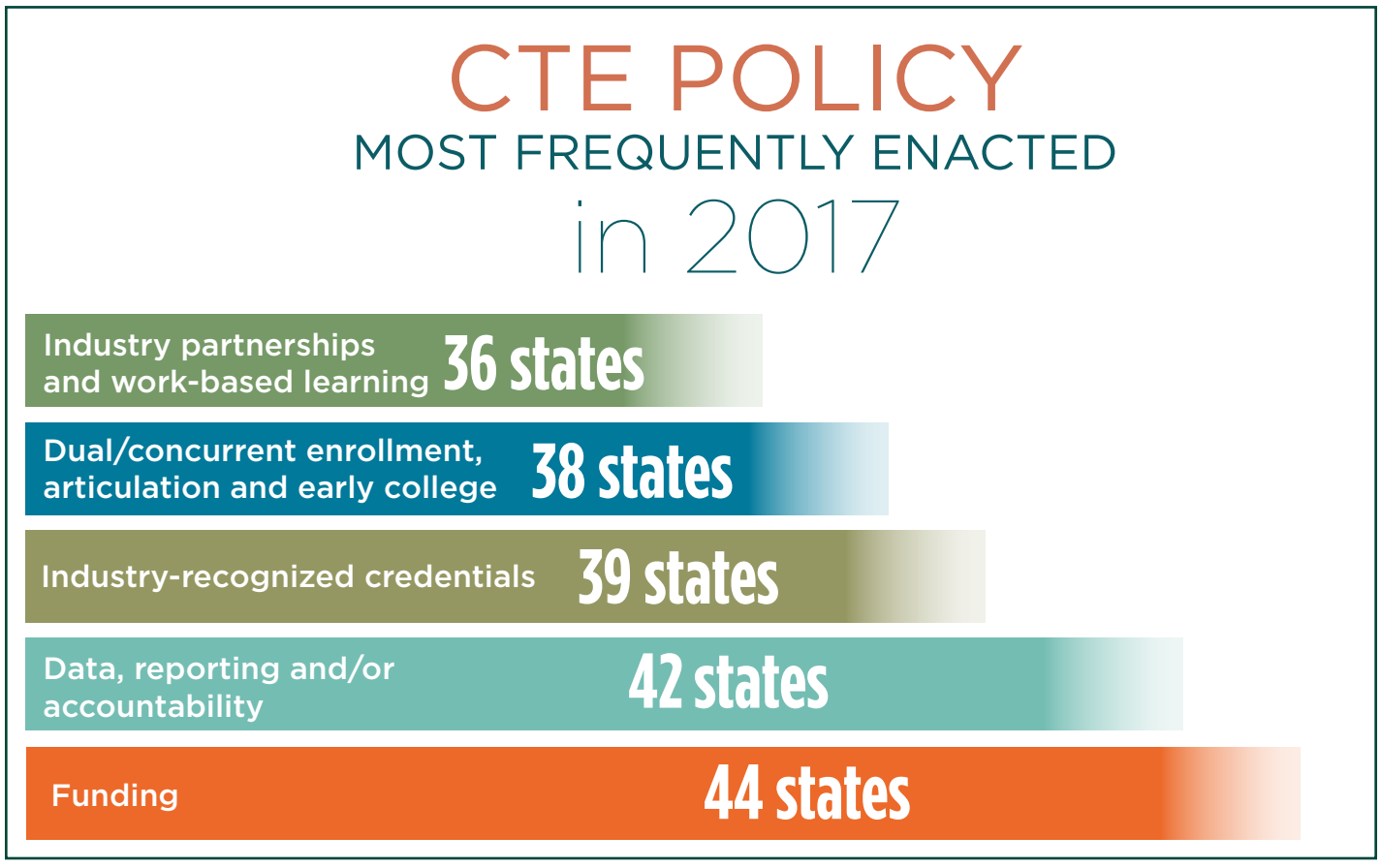
STATE POLICIES PRIORITIZE CTE

By Catherine Imperatore

STATES HAVE DIRECTED A REMARKABLE AMOUNT OF ENERGY, ATTENTION AND RESOURCES TO career and technical education (CTE) in recent years — and 2017 was no exception. Last year, 49 states and the District of Columbia enacted CTE policy, including legislation, executive orders, board of education actions and budget provisions. These policies demonstrate how states prioritize CTE and career readiness, a trend shown clearly in evidence since ACTE and Advance CTE began publishing a comprehensive review of state CTE policies in 2013.

In 2017, states enacted policy related to funding most frequently. This is the fifth year that funding has been the most popular policy category, including direct appropriations to CTE programs as well as scholarships, grants and tax incentives, among other mechanisms. Data, reporting and/or accountability was the next most common policy category, largely driven by states incorporating career readiness into accountability systems in response to the flexibility offered under the Every Student Succeeds Act (ESSA). The ESSA influence was also a factor in the industry-recognized credentials category, as states incorporated these credentials into their accountability systems; set postsecondary attainment goals for their populations; or changed how they validate the quality and relevance of industry certifications. In the dual/concurrent enrollment, articulation and early college category, states expanded early college programs, supported or formalized dual credit opportunities and allowed noncredit education to count toward a relevant credential. Finally, in the industry

> “Among the many states to initiate changes that support CTE, Michigan and Maryland are two states in which 2017 policies reflect a coordinated approach to addressing workforce challenges.”



partnerships and work-based learning category, the majority of policies promoted work-based learning, particularly apprenticeships (Imperatore & Estes, 2017).

Among the many states to initiate changes that support CTE, Michigan and Maryland are two states in which 2017 policies reflect a coordinated approach to addressing workforce challenges: Michigan through its Career Pathways Alliance and resulting investments in CTE, and Maryland through registered and youth apprenticeship connected to CTE programs.

Michigan

Last year Michigan prioritized CTE in its Fiscal Year (FY) 2018 budget with a new $12.5 million investment, including $7 million to be distributed equally to career education planning districts (CEPDs) across the state to update equipment for CTE programs in high-wage, high-skill and high-demand fields. In addition, $5 million was set aside for competitive grants and $500,000 was promised for mechatronics programs. Additional funds support career counselors; competitive grants in information technology (IT) and science, technology, engineering and mathematics (STEM) subjects; online career exploration; and a STEM network known as MiSTEM. This budget builds on the state's prior investments in CTE, including a $10 million funding increase in the FY 2016 budget.

The competitive grant funding was awarded in January 2018 to districts that demonstrated they could identify and respond to local need for a high-wage, high-skilled workforce by increasing career awareness, partnering with employers, aligning curriculum across education levels, expanding access to students in rural or remote locations, and demonstrating sustainability.

Among the grant winners was Alpena Public Schools, which received $400,000 for equipment to fit out a mechatronics and design lab and a computer lab. Students will manage their own businesses creating textile, wood, metal and plastic products. This investment will support the school district as it becomes the first in the state to offer the course Algebra I with Manufacturing Processes, Entrepreneurship and Design. Another grant recipient was Center Line Public Schools, which received $105,000 to develop a pre-apprenticeship in sheet metal, partnering with Sheet Metal Works' Local 80. Pre-apprenticeship students who successfully complete the program will be eligible for a paid apprenticeship.

The state has acted quickly to expand its commitment to talent development. These investments were largely driven by recommendations released last year by the Michigan Career Pathways Alliance, which is spearheading a statewide effort to develop the workforce. The Alliance, created by Gov. Rick Snyder and comprised of more than 100 education, business, economic development and labor organizations across the state, is coordinated by the state's Department of Talent and Economic Development.

The Michigan state superintendent has directed the state Department of Education to implement other Alliance recommendations, including requiring that state-funded CTE programs lead to an industry-recognized credential; requiring schools to submit plans for career exposure in elementary, middle and high school; allowing externships to qualify for teacher professional development and continuing education credit; expanding authorization for non-teacher certified CTE instructors up to 10 years; developing a CTE best practices playbook; and providing technical assistance to school districts for integrating CTE programs with the Michigan Merit Curriculum.

The recommendations have also led to the creation of new career and education advisory councils that aim to more effectively develop partnerships between secondary and postsecondary education, training providers, advocates and employers than the former talent district career councils and education advisory groups. The councils will advise workforce development boards and school districts within each of the state's 16 service areas. Each council must include CTE administrators as well as at least three employers in high-demand industries, a union representative, educators from secondary and postsecondary schools, and parents.

To generate student interest in education and careers in CTE fields, in 2017, the state launched the second phase of its Going PRO campaign, "designed to elevate the perception of professional trades and to showcase opportunities in a variety of rewarding careers" ("Career exploration," 2017), with the launch of a website, the Pathfinder career exploration tool and a new video depicting real individuals employed in CTE fields.

Michigan's continued commitment to CTE has already had positive results. According to state CTE leaders sharing with *The Detroit News*, CTE programs in the state have grown by almost 5,000 students since 2015, particularly among 11th- and 12th-grade students (Chambers, 2017). This enrollment growth is attributed to state funding in CTE programs and to the Going PRO campaign.

Maryland

In 2017, Maryland policymakers worked across the aisle, bolstered by Gov. Larry Hogan's support for skills building, to address the workforce needs of students and businesses. The More Jobs for Marylanders Act of 2017 comprises a bipartisan package of policies that gives employers relief from sales, property and income taxes while promoting CTE programs and work-based learning. This legislation builds on other steps the state has taken to support CTE and work-based learning, particularly youth and registered apprenticeship.

Youth apprenticeship and secondary CTE programs are promoted in the Act through accountability provisions. The legislation requires the establishment of statewide goals for the percentage of high-school students who have completed a CTE program; earned an industry-recognized credential; or completed a registered or youth apprenticeship. The goals will increase annually, reaching 45 percent by 2025. In addition, the More Jobs for Marylanders Act directs the state Board of Education to determine how to recognize the following as equivalent to earning a score of three or higher on an Advanced Placement exam: participating in a CTE program at the concentrator level and earning a related industry credential, or completing a youth apprenticeship or other apprenticeship approved by the Maryland

Apprenticeship Training Council. Maryland's ESSA plan, submitted in 2017, also includes CTE concentration, industry credentials and youth and registered apprenticeships as options for fulfilling the well-rounded curriculum portion of the accountability framework for high school students.

Postsecondary and adult students are not forgotten: The legislation creates a scholarship to provide up to $2,000 per year for students participating in community college programs that include job preparation or apprenticeship; licensure, certification or job-skill enhancement; and that do not lead to an associate or bachelor's degree. The scholarship can be used to pay for tuition, fees and other costs.

To improve data on apprenticeships and better implement the aforementioned changes to the state accountability system, the bill calls on the Maryland Longitudinal Data System Center, supported by the state Department of Education and Department of Labor, Licensing and Regulation (DLLR), to better track and analyze apprenticeship participation, with particular reference to students participating in CTE courses.

To incentivize businesses to participate in apprenticeships, the legislation enables employers to claim a tax credit of up to $1,000 for each apprentice in their employ who is enrolled in an apprenticeship program registered with the Maryland Apprenticeship and Training Council.

The More Jobs for Marylanders Act continues the state's cross-agency support for youth apprenticeship, in combination with CTE programs. In 2016 the state began to pilot a youth apprenticeship program — a collaboration among the State Department of Education, DLLR and the Maryland Department of Commerce. The pilot has grown into Apprenticeship Maryland, through which students 16 years of age and older can pursue learning and earning in a variety of career pathways, with a particular emphasis on manufacturing and STEM fields. The youth apprenticeship consists of a minimum 450 hours of work-based learning and at least one year of related classroom instruction. Participants must earn at least minimum wage. On average, youth apprentices make approximately $10.75 per hour, with some students earning as high as $14.00 per hour.

Apprenticeship Maryland is growing. In the 2017–18 school year, 18 students participated, up from 11 students in the prior school year. The program has seen exponential growth in business participation: 38 employers by February 2018, a 171-percent increase from the 14 employers who participated in the 2016–17 school year — in sectors that include manufacturing, IT, construction, health care and automotive.

Several employers participating in Apprenticeship Maryland have expressed interest in expanding beyond youth apprenticeships to registered apprenticeships. Since 2015, the number of registered apprentices in Maryland has increased by nearly 20 percent, to approximately 9,600 ("State announces," 2018). A new Maryland Apprenticeship Ambassador Program, launched in January 2018, will further promote and incentivize apprenticeship.

While policies set into place in the More Jobs for Marylanders Act and related initiatives are nascent, this cross-agency commitment to apprenticeship and CTE programs is starting to bear fruit.

Conclusion

In 2017, states demonstrated through legislation, executive orders and other policy actions that they value the benefits CTE programs deliver for students, workers and employers. Among these states, Maryland and Michigan represent two distinct approaches to developing students' career readiness. Despite their differences, both states took a multi-pronged approach to tackling opportunities and challenges in CTE and workforce development, including CTE curriculum, work-based learning and collaboration across agencies and with employers. ■

Catherine Imperatore is research manager for ACTE. She tracks CTE data and accountability issues, follows state CTE policy, produces publications and conducts research and evaluation. Imperatore has a master's degree in sociology from George Mason University and has been published in the *Peabody Journal of Education*. Email her at cimperatore@acteonline.org.

"In 2017, states demonstrated through legislation, executive orders and other policy actions that they value the benefits CTE programs deliver for students, workers and employers."

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READ

Learn more with State Policies Impacting CTE: 2017 Year in Review, the fifth annual publication from ACTE and Advance CTE. Read this publication and reports from prior years at **www.acteonline.org.**

CTE SUCCESS: THE RED ZONE SPIRIT STORE

By Janet Westhues

CARROLLTON IS A SMALL, RURAL, FARM TOWN LOCATED IN NORTHWEST MISSOURI. DUE TO THE town's size and rural location, students at the Carrollton Area Career Center (CACC) often lack opportunity for work-based learning experiences. At the beginning of the 2014–15 school year, Cathy Benson, a CACC marketing instructor, began to research ideas for a project her DECA students could create and build upon in the future. Years before she had sold apparel as part of a DECA project and, when looking for a long-term addition to her curriculum, she drew from her past experiences with success.

Benson believed a spirit store would benefit the students, the school and the community, so she and her marketing students formulated a plan to present to administrators and the Board of Education. In collaboration with fellow CACC instructors, students and administration, and with the School Board's approval, the spirit store broke ground in August 2014.

The first-ever of its kind, The Red Zone operates a permanent location at Carrollton High School and a mobile store, used to serve home football games and community events. The Red Zone

“Giving students a chance to learn in a “real-world” environment was a top priority for Benson when creating The Red Zone, where students are able to hone their marketing, accounting, design, technical, leadership and employability skills.”

offers hoodies, sweatshirts, T-shirts, long-sleeved T-shirts, jackets, pullovers, hats, visors, bucket hats, beanies, scarves, bleacher seats and spirit items. From the beginning, the spirit store project was piloted by students. A contest, submissions and voting, were held to choose a name for the new spirit store, and The Red Zone became official.

Graphic arts students were asked to present several ideas for the logo, which gave them an opportunity to use their creativity, and the chance to have their artwork displayed for years to come. CACC graphic arts students were also tasked with creating vinyl decals to place in the spirit store and on the mobile store. The Red Zone has provided opportunities for real-world, hands-on experience, valuable experiences the students would not receive sitting in a traditional classroom.

Creating Hands-On Learning Opportunities

Students enrolled in the marketing, business or graphic arts programs at the Carrollton Area Career Center can contribute to the Red Zone. Each program provides different learning opportunities based on the dynamics of the program. Giving students a chance to learn in a “real-world” environment was a top priority for Benson when creating The Red Zone, where students are able to hone their marketing, accounting, design, technical, leadership and employability skills.

Marketing students are responsible for managing and operating the store. Students use the skills they learn in the classroom to conduct market research, through which they are able to source trending apparel that appeals to consumers and at price points consumers are willing to pay. Students always are looking for new items to keep customers interested and craving more apparel. Window displays, merchandising and pricing are also important factors of success for the spirit store. Students exercise creativity to create appealing and interesting displays for their customers.

Cathy Benson has created fun and challenging curriculum for her classes, incorporating the needs of running a successful spirit store. Students in a new retail class, designed for those interested in running The Red Zone, are placed in charge of taking outside orders, counting money, tabulating orders, packaging orders and delivering orders. Students keep a running track of inventory and reorder or purchase more apparel when supplies are low. Benson’s retail students open the store during the last hour of the day for students, staff and outside customers to purchase apparel. The store is open for all home games, parent nights and special occasions. Students are scheduled to work during these days to gain real-world experience and knowledge of business and marketing management.

The Carrollton Area Career Center’s graphic arts program is the main supplier of The Red Zone merchandise. Graphic arts students are tasked with designing apparel for fall, winter and spring seasons; they research trends in designs before creating their apparel and the designs are then submitted for approval and a student vote. The students create designs for individual sports, as well as generic and glitter apparel. This process allows them to showcase their creativity and have a stake in the overall appearance of the product.

They work with heat transfer vinyl, screen-printed transfers and embroidery; graphic arts students take charge of the whole manufacturing process. Students receive the tabulated count from the marketing classes and begin gathering apparel to design. Glitter flake heat-transfer vinyl and screen-printed transfers are heat pressed onto the apparel by students who set up an assembly line to get the job done. Once shirts are heat pressed, they get passed on to students to be folded. Once shirts are folded, they are placed in the appropriate size piles where another student checks off on quality control and quantities.

Students also take charge of loading apparel on the embroidery machine. When all the apparel is completed, the students deliver the products to Benson's class for sorting and packaging. The whole manufacturing process, from design to completion, has allowed students the opportunity to polish their technical, communication, leadership and teamwork skills.

CACC Business Instructor Cindy Mayden assigned her business technology class to handle the financials for The Red Zone. Business technology students run the balance of The Red Zone account with invoices and receipts to check income and expenses, working closely with marketing students to balance the budget, to the penny, using Microsoft Excel. By regularly checking The Red Zone's balance, students are able to see where the money is being spent and where they are collecting the most revenue.

Learning through the Challenges

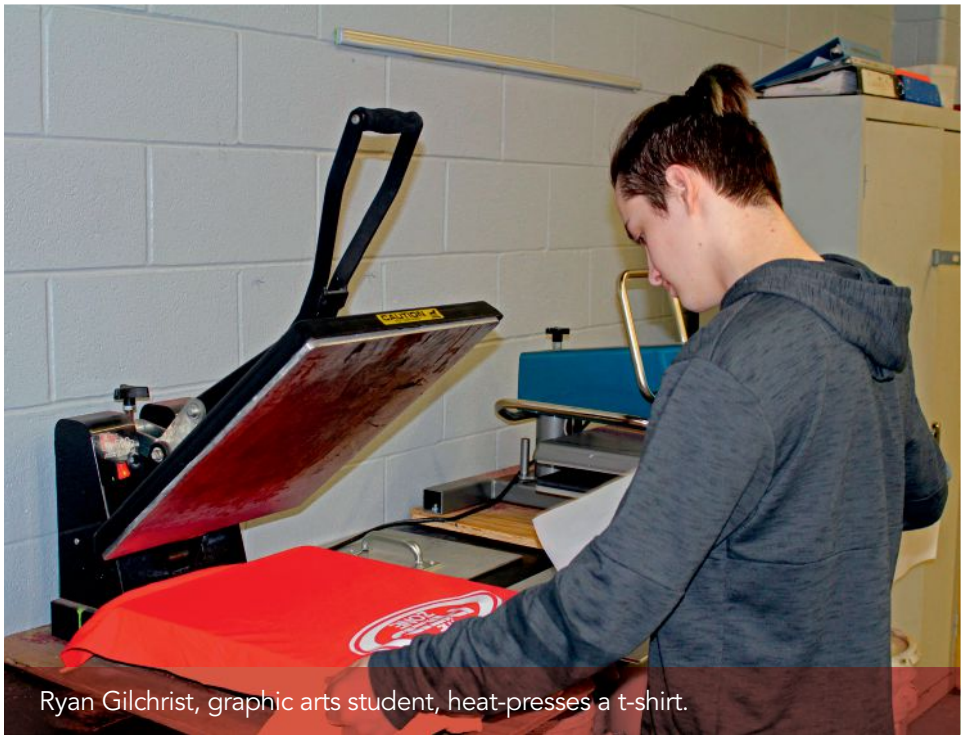
While the students have been successful, there were challenges and roadblocks along the way. The launch of The Red Zone happened in a time crunch; the approval was granted in August, and the store needed to be up and running by September. Graphic arts students were tasked with roughly two weeks to design and produce apparel for the opening of the store.

Though students came back to school and immediately got to work, they did not have time to learn the in-depth screen printing process, nor to gather hands-on experience. At first, they found it difficult to print shirts at a high-quality and professional rate. Too many shirts were being wasted because too much ink was printed or the designs were printed crooked. A solution came with the decision to outsource designs to a professional heat transfer company, where they were to be screen printed onto transfer paper and sprinkled with transfer powder. By using heat transfers, time and waste are cut in half. Now, every shirt looks professional and ready to sell.

One additional challenge for the students centered on communication, as they learned they must communicate between classes in order to be successful. Students learned valuable communication skills through talking to each other, customers and outside manufacturers. Quality control and time management were also put to the test. In the beginning, students rushed to get orders fulfilled without taking the time to double check for correctness. Some customers received another person's order or were short items they had ordered.

Students have learned to slow down and take their time when manufacturing apparel and fulfilling orders. The Red Zone has provided all students involved the opportunity to learn valuable employability skills. Students continually improve teamwork, communication, timeliness and professionalism skills. As customers browse through The Red Zone, the students' dedication to their school store and pride in their work is evident.

Throughout the first year, the school district allowed The Red Zone to run at a deficit, as there were a lot of expenses involved in getting the store up and running. Now, the students are able to run the store with a profit around $5,000 each year. Some of the money earned goes to the career and technical student organizations (CTSOs) involved in The Red Zone: DECA, FBLA and SkillsUSA. After monies are transferred to the appropriate CTSO accounts, the rest remains to purchase items for the next school year. After running the store for three and a half years, students and teachers have established a routine and calendar to follow, which has proven to be successful for everyone involved.


Ryan Gilchrist, graphic arts student, heat-presses a t-shirt.

Student Success

Student success is the number one priority behind The Red Zone spirit store. Through hands-on learning, students become better prepared for their futures with leadership, technical and communication skills, as they also take a personal interest in the quality of their work.

The project expands each year as new students become interested, technology is

The Red Zone mobile store is open during home football games.

updated and trends evolve. As teachers, we want to see our students reach their full potential. The Red Zone provides CACC students a different approach to learning, outside the traditional classroom, and they are thriving! Career and technical education (CTE) provides students technical, hands-on education and employability skills and those students leave high school ready to face the next step in their future journey. Some students will continue their education through a four-year college; some will attend trade or technical schools, while others will enter the workforce. Furnishing our CTE students with education and experience that prepares them for their future is a great way to showcase CTE success.

Janet Westhues is a graphic arts instructor at the Carrollton Area Career Center. She holds a Bachelor of Fine Arts in graphic design from The University of Central Missouri and is currently working on a Master of Science in career and technical education. Email her at westhues-janet@trojans.k12.mo.us.

$1 Million in Prizes for Skilled Trades Teachers and Classrooms

HARBOR FREIGHT TOOLS FOR SCHOOLS

ACTE is pleased to announce that Harbor Freight Tools for Schools, a program of the Smidt Foundation, is inviting applications for the 2018 Harbor Freight Tools for Schools Prize for Teaching Excellence. Three first-place prizes ($100,000) will be awarded to outstanding U.S. public high school skilled trades teachers and their classrooms — $70,000 to the program and $30,000 to the teacher/teacher team behind the winning program. Fifteen second-place winners will each be awarded $30,000 — $20,000 to the program and $10,000 to the teacher/team. Beyond the prize earnings, applicants gain access to powerful ideas and practices, shared through a series of online expert-led learning modules and provocative questions.

Registration via website opened on **April 3** and the all-digital application opens on **May 16, 2018**. Winners will be announced on Nov. 15, 2018. To learn more or enter, visit **www.hftforschoolsprize.org**.

CTE Develops the Hospitality and Tourism Workforce

ACTE recently updated its Sector Sheet describing career and technical education's (CTE) role in preparing the qualified workforce in hospitality and tourism. The updated Sector Sheet provides the latest information on occupational outlook and earnings potential and describes exemplary CTE programs that are preparing secondary and postsecondary students for careers in hospitality and tourism. You can access this and 12 other publications in the series at **www.acteonline.org/SectorSheets**.

ACTE's CareerTech VISION 2018

Join us in San Antonio – Early Bird Registration Open through July 13

The premier event for CTE professionals to connect and collaborate, ACTE's CareerTech VISION 2018 will feature high-quality CTE programs and strategies for successful innovation in the classroom. This **Nov. 28–Dec.**, thousands of educators, business leaders and industry representatives will gather in San Antonio, Texas to:

- Engage with education and workforce leaders
- Learn from leading keynote presenters and more than 300 concurrent sessions covering secondary and postsecondary CTE topics and trends
- Experience more than 200 exhibitors in the CareerTech Expo featuring live demonstrations, interactive workshops and numerous networking opportunities
- Connect with business representatives in the Career Pavilion showcasing multiple employment sectors and several resources on CTE career pathways
- Take part in Wednesday workshops and tours on focused CTE topics and successful programs
- Participate in the Saturday STEM is CTE Symposium
- Join in an inspirational gathering of passionate CTE professionals and supporters at the ACTE Awards Banquet

Register in time to secure early-bird rates available through July 13. Visit **www.careertechvision.com** for the latest agenda and to register.

Three Thriving Events in One Vibrant Location!

For a wealth of professional development, leadership and networking opportunities, this year's ACTE and NCLA Best Practices and Innovations in CTE Conference will take place **Sept. 26–28** in beautiful Louisville, Kentucky, in conjunction with ACTE's Region II Conference, **Sept. 28–29**, and the Credential Summit 2018 on **Sept. 25**. View the event agendas and register at **www.acteonline.org/bestpractices**.

Externship Opportunities via Industry Insider Tours

Transform your CTE programs by participating in immersive, two-day tours designed to provide educators and ad-

ministrators the unique opportunity to learn about exemplary business-education partnerships that might be replicated, in whole or in part, in their own communities. Attendees will have the opportunity to interact with leaders in business, industry and education through focused interactive sessions, informative tours and engaging networking events. Watch **www.acteonline.org/iitours** for sector-specific events coming this fall.

Online Self-paced Courses for CTE Professionals

Offering an array of topics that focus on effective teaching and leading strategies, CTE Learn provides online professional development with self-paced courses that can be completed at work or at home. Delivered through an easy-to-access, interactive learning management system that features rich media, participants have access to a growing collection of courses including:

- Global Competence through CTE
- Basic Training for Educators
- Concentrating on Reality Education 101

CTE Learn courses not only build skills but come with documentation that can be used for re-certification. Continuing education and graduate credit is available for an additional fee. View the expanding collection and get started today at **www.acteonline.org/cte_learn**.

Lapel Pin Celebrating 100+ Years of CTE

Show off your support for CTE with this signature lapel pin, for only $2.75. Browse the complete collection of products and purchase yours today at **www.acteonline.org/shop**.

Fact Sheet on Career Readiness and Employability Skills

ACTE has produced a new fact sheet connecting the general workforce skills that employers most need — professionalism, teamwork, critical thinking, oral and written communication, leadership and more — with research demonstrating that CTE helps students develop career readiness and employability skills that have value across industries and career fields.

The research addresses various aspects of CTE programs, including curriculum, work-based learning, career and technical student organizations and career guidance. Use this fact sheet to show students, parents and others how CTE leads to readiness for all careers!

You can access this one-page publication and ACTE's other fact sheets at **www.acteonline.org/factsheets**.

2019 Board of Directors: Nominations are Open!

Nominations for the 2019 Board of Directors election are open now through June 15. Only ACTE members (by October 30) will be eligible to vote, beginning at ACTE's CareerTech VISION on November 30 and ending at 11:59 p.m. on December 31. Winners will be announced the week of January 1, 2019.

The following positions are eligible for election:

- President-elect: Serves a one-year term beginning July 2019, followed by one year as president and one year as past president
- Region II Vice President: Serves a three-year term beginning July 2019
- Business Education Division Vice President: Serves a three-year term beginning July 2019
- New and Related Services Vice President: Serves a three-year term beginning July 2019
- Family and Consumer Sciences Vice President: Serves a three-year term beginning July 2019
- Region I Vice President-elect: Serves a three-year term beginning July 2020
- Region IV Vice President-elect: Serves a three-year term beginning July 2020
- Engineering and Technology Education Division Vice President-elect: Serves a three-year term beginning July 2020

If you have any questions or concerns, please contact Lauren Lessels at llessels@acteonline.org. More information about the election can be found at **www.acteonline.org/board_election**.

WATER AND WASTEWATER TREATMENT PLANT OPERATORS

By Susan Reese

WATER AND WASTEWATER TREATMENT PLANT OPERATORS MANAGE A SYSTEM OF MACHINES USED to transfer or treat and purify water or wastewater, and to process and dispose of sewage. They add chemicals to disinfect the water, and collect and test water and sewage samples. Their duties may include regular inspection of equipment, recording data, and documenting and reporting test results to regulatory agencies such as the U.S. Environmental Protection Agency (EPA). They must also be knowledgeable about EPA regulations.

The Workplace

Water and wastewater treatment plant operators work in government facilities, for utilities and in manufacturing, but the U.S. Department of Labor reports that local governments were, by far, the largest employer of water and wastewater treatment plant operators.

Education

Water and wastewater treatment plant operators typically need a high school diploma or equivalent, but the Department of Labor notes that employers may prefer applicants who have completed a certificate, an associate or a bachelor's degree program in a related field, such as environmental science or wastewater treatment technology. Two-year programs in wastewater treatment and water quality management are available at a number of technical and community colleges. State licenses are required for water and wastewater plant and systems operators, and the requirements vary from state to state.

Earnings

According to the U.S. Bureau of Labor Statistics *Occupational Outlook Handbook*, the median annual wage for water and wastewater treatment plant and system operators was $45,760 in May 2016, with the highest 10 percent earning more than $73,120.

Job Outlook

Although the U.S. Bureau of Labor Statistics doesn't predict strong growth in the field, it also notes that numerous operators are expected to retire in the next decade; their jobs will need to be filled. Moreover, although greater automation and advancements in technology may mean fewer workers, skilled, well-trained employees will be needed to operate complex controls and systems.

EXPLORE MORE

For more information about the career of water and wastewater treatment plant operator, here are some places to turn.

American Water Works Association
www.awwa.org

National Rural Water Association
www.nrwa.org

United States Environmental Protection Agency
www.epa.gov

Water Environment Federation
www.wef.org

WaterOperator.org
www.wateroperator.org

Work for Water
www.workforwater.org

SCHOOL SPOTLIGHT

EMILY GRIFFITH TECHNICAL COLLEGE

EMILY GRIFFITH TECHNICAL COLLEGE DESCRIBES ITSELF AS "COLORADO'S MOST UNIQUE PUBLIC college and one of the first tech colleges in the nation." The school was founded more than 100 years ago and still uses the motto coined by Emily Griffith herself. That motto reflects thinking that was well ahead of its time and retains remarkable relevance with regard to today's career and technical education (CTE): "For all who wish to learn. We welcome all people, regardless of age, race or education level, who want to expand their horizons and chart their own course for success."

Its progressive view also meant that, even at its inception in 1916, Emily Griffith Technical College provided education to immigrants in Colorado. Today it is recognized as a Hispanic Serving Institution by the Hispanic Association of Colleges and Universities, meaning that Hispanic enrollment constitutes a minimum of 25 percent. Although this varies by year, the CTE student body averages about 65 percent women.

The college estimates that it has assisted more than two million students total, and now serves approximately 8,000 students each year. Those students may attend three downtown Denver campuses, or they may take advantage of 19 apprentice trades programs taught on site in Colorado Springs, Pueblo and the Western Slope. In addition to its accreditation by the Council on Occupational Education, the college also has received numerous accreditations for individual programs.

The Emily Griffith curriculum includes more than two dozen CTE training programs in areas that include health sciences, creative arts and design, administration and professional studies, and trade and industry. The water quality management program is part of the school's College of Trades, Industry and Professional Studies.

The 10-month water quality management program is designed to help prepare students for entry-level employment, as well as for state and Level D certification. Thirty-four program credits include introductory courses in wastewater collection, wastewater treatment, water quality, water distribution and water treatment. Additional courses include specific calculations for water quality management, drinking water regulations, industrial waste monitoring, water quality analysis and biological bacteriological lab. Students in the program benefit from hands-on learning opportunities such as field trips, tours, guest lectures, lab analysis and group activities.

Emily Griffith offers a path to success for students beginning in high school; a concurrent enrollment program offered by the Denver Public School District means qualified high-school students can earn college credits or certificates — and they may even be able to do so for free through funding provided by the program. Students may transfer up to 45 credit hours toward an associate of applied science degree at any Colorado community college.

The U.S. Environmental Protection Agency (EPA) notes, "The collection and treatment of domestic sewage and wastewater is vital to public health and clean water. It is among the most important factors responsible for the general level of good health enjoyed in the United States."

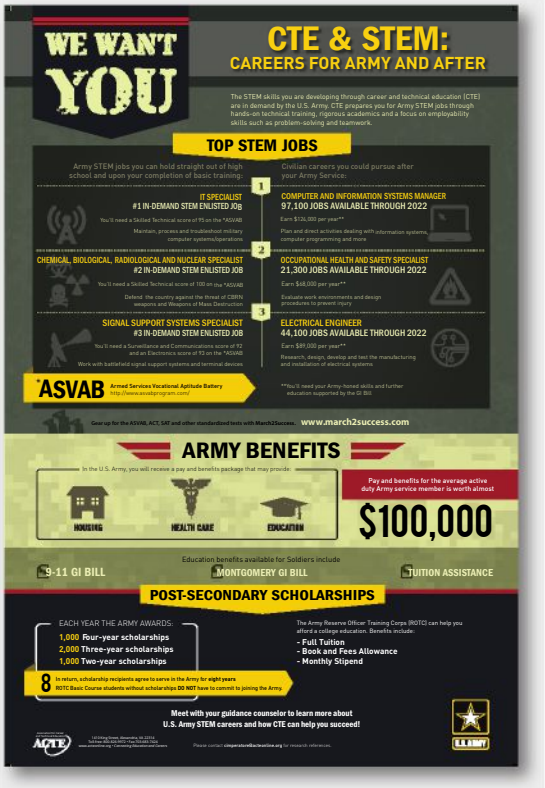
For Colorado, Emily Griffith Technical College is helping provide the workforce to ensure that clean water will be continue to be available, thereby ensuring the public safety and health of the state's residents.

For more information about Emily Griffith Technical College and its Water Quality Management program, visit ***www.emilygriffith.edu***. ■

Susan Reese is a *Techniques* contributing writer. Email her at susan@printmanagementinc.com.

FROM THE ARMY TO CIVILIAN CAREERS, CTE PROVIDES THE FOUNDATION FOR SUCCESS

WITH TODAY'S WORKFORCE BECOMING INCREASINGLY COMPETITIVE, HAVING THE TRAINING AND skills in high-demand careers has never been more important. As the nation's largest investor in education, the United States Army understands this better than anyone, comprised of specialized teams that make a real difference in the world and for the country every day. Investing in education is one of the Army's greatest efforts because it recognizes the importance of having an equipped workforce able to face the uncertainties of tomorrow and lead others to success — not only in the military, but also in the civilian workforce.



However, in order to make the dream of a skilled and educated workforce a reality, graduation from high school is imperative. Every day, more than 1.2 million students drop out of high school in the U.S. ("11 facts," n.d.). With this in mind, the Army has continued to develop and improve its many career paths to give students additional options that fit their individual needs and goals, so that dropping out is never an option.

Together with career and technical education (CTE) programs, the Army continues to work toward a goal of helping to raise the graduation rate for high school students across the country. Throughout the years, CTE has helped more students excel and graduate from high school, preparing them for success in postsecondary education and in their careers. For CTE students, the average high school graduation rate is considerably higher than the average national freshman graduation rate. CTE and Army training emphasize the importance of leadership through experience. CTE provides an exciting, hands-on learning environment that brings science, technology, engineering and mathematics (STEM) to life, so that students can apply core academics to real-world situations. CTE programs strengthen students' understanding of STEM by introducing them to many high-demand career pathways in these fields.

Just as a strong CTE foundation is preferred in many STEM occupations, it is imperative that soldiers possess a sound technical background for many of the jobs within the Army. CTE prepares soldiers for STEM careers through applied technical training, rigorous academics and a focus on employability skills, such as problem-solving and teamwork. The Army offers unique, professional pathways that set up students for long-term success, whether they begin upon enlisting in the Army or first pursuing higher education in their chosen field.

The Army offers more than 200 specialized career paths — or Military Occupational Specialties (MOS) — many of which align with the 16 CTE careers clusters in fields such as healthcare, culinary arts and transportation. With more than 50 potential STEM careers and a vast array of educational benefits, the Army is known as one of the top educators and career trainers in STEM. In fact, the Military Academy at West Point is one of the most esteemed engineering schools, boasting a variety of leadership opportunities for students.

With STEM occupations projected to grow faster than the average for all occupations, now is the time for students to reap the benefits of a prosperous job market. According to the United States Department of Commerce's Economic and Statistics Administration (ESA), overall STEM employment is expected to grow 8.9 percent by 2024 — faster than the 6.4-percent rate of growth projected for all occupations (2017). Not only are STEM occupations predicted to grow faster than other career fields, STEM workers earned 29 percent more than their non-STEM counterparts in 2015 ("STEM jobs," 2017).

STEM careers continue on an upward trajectory because these fields are critical to the advancement of our society, as well as the security of our nation. STEM careers place soldiers in charge of important

Officer Careers

Science	Technology	Engineering	Mathematics
Medical Service Corps Officer	Cyber-Operations Specialists	Engineer Officer	Military Intelligence Officer
Environmental Science/ Engineering Officer	Signal Officer	Environmental Science/ Engineering Officer	Financial Manager
Biochemist/ Physiologist	Warrant Officer Corps	Systems Automation Acquisition Engineer	Operations Research Systems Analysis
Microbiologist	Health Services Maintenance Technician (CBRN) Officer	Nuclear Engineer	Chemical, Biological, Radiological and Nuclear (CBRN) Officer
Clinical Laboratory Scientist	Intelligence Systems Integration and Maintenance Technician	Industrial Engineer	Army Astronaut
Research Psychologist	Geospatial Imaging Officers	Electronic Systems Maintenance Warrant Officer	Space Operations Officers

Enlisted Careers

Science	Technology	Engineering	Mathematics
Medical Laboratory Specialist	Computer/Detection Systems Repairer	Geospatial Engineer	Unit Supply Specialist
Optical Laboratory Specialist	Information Technology Specialist	Horizontal Construction Engineer	Test Measurement and Diagnostic Equipment Maintenance Support Specialist
Petroleum Laboratory Specialist	Multimedia Illustrator	Technical Engineer	Financial Management Technician
Mortuary Affairs Specialist	Signals Intelligence Analyst	Watercraft Engineer	Automated Logistical Specialist

missions, which include not only surveillance, communications and intelligence, but careers that revolve around maintaining the safety of water and construction sites in and around Army bases and installations. The STEM training and experience that soldiers receive while serving is highly beneficial within the civilian world, as many STEM MOSs translate into exciting STEM civilian careers.

With this in mind, Careers in the Military (CITM) gives students and soldiers a resource to explore thousands of military careers and find the equivalent civilian careers; get an overview of current high-demand jobs in the military; and discover the qualifications needed to pursue each job. The resource, powered by the ASVAB Career Exploration Program, also provides a guided search tool. With the tool, visitors can answer a series of questions based on their career preferences and, upon completion, will receive a recommended list of career specialties.

For students interested in pursuing the officer route in the Army, the Reserve Officers' Training Corps (ROTC) offers the perfect path. With a total of 274 host programs and more than 1,000 partnership and affiliate colleges and universities across the country, Army ROTC produces approximately 67 percent of officers for the Army. Army ROTC prepares students for competitive careers in any field, enhancing the traditional college experience with a high level of leadership training they'll be able to tap into for a lifetime. It also provides many benefits, including full tuition, book and fees allowance, and a monthly stipend. Just last year, the Army awarded approximately $274 million in Army ROTC scholarships to more than 13,000 students across the nation — all studying a variety of specialized fields.

No matter which career path students decide to pursue, in the military or civilian world, one thing holds true: CTE provides the foundation for success. ■

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United States Department of Commerce, Economics & Statistics Administration. (2017). STEM jobs: 2017 update. Retrieved from http://www.esa.doc.gov/reports/stem-jobs-2017-update.

EXPLORE

Learn more about Army's educational and career opportunities: **www.ArmyEdSpace.com.**

Careers in the Military (CITM): **www.careersinthemilitary.com**

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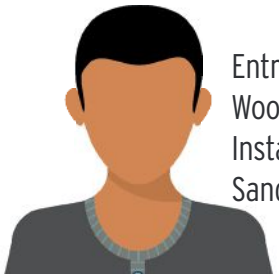

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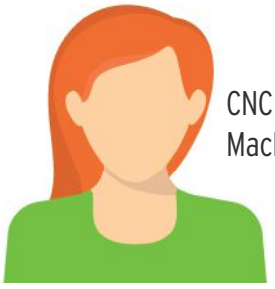

CNC Machinist

AVERAGE SALARY

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Lobbyist

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More information is available at https://www.nwfa.org/nwfa-wood-studies-scholarship.aspx.

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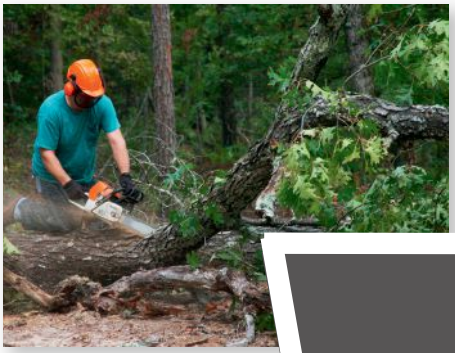
**Data taken from salary.com.*



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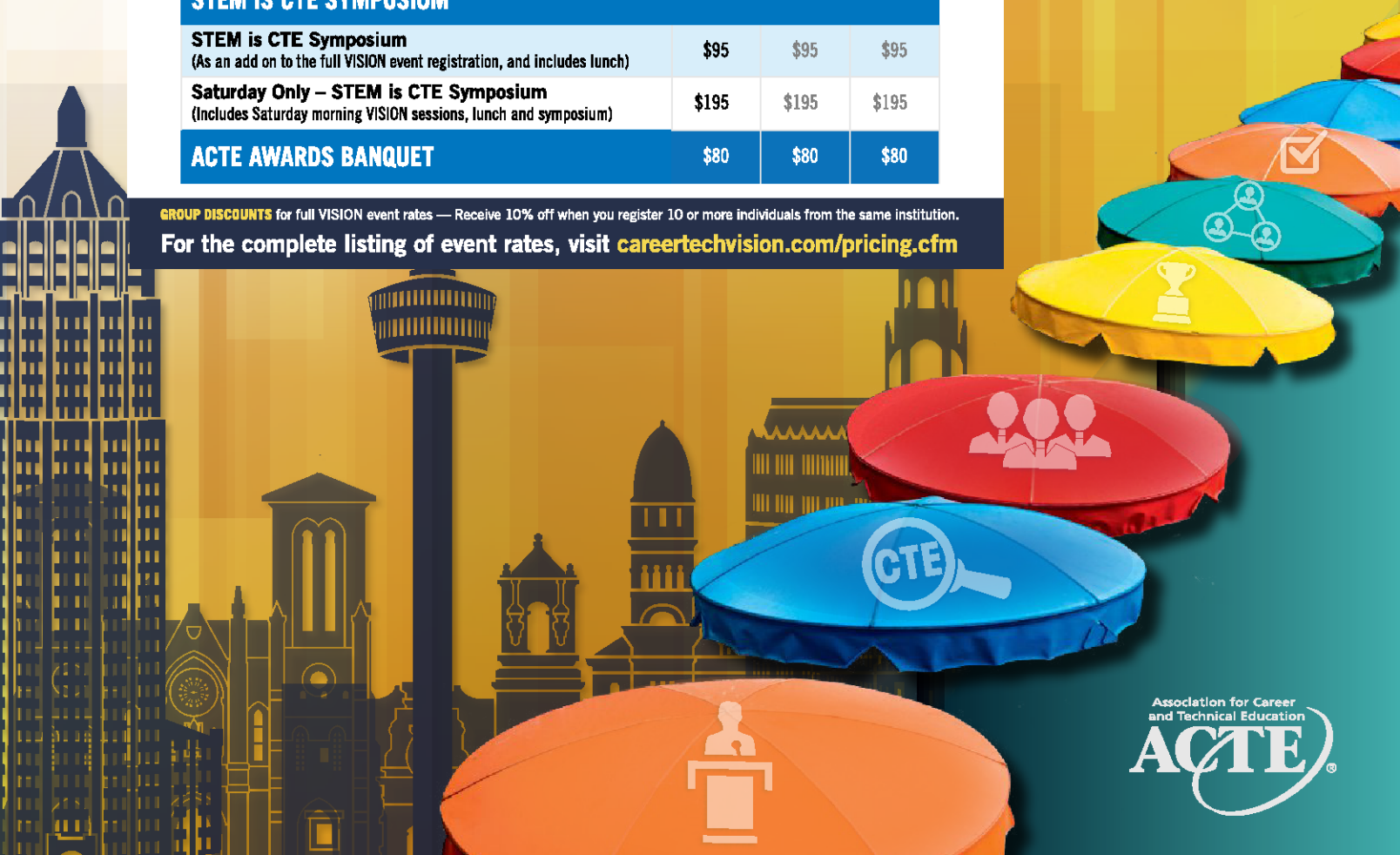

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