

Techniques

JANUARY 2020

CONNECTING EDUCATION AND CAREERS

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EXPERIENTIAL LEARNING AT WORK

- Entrepreneurship Education
- Why is Space Exploration Important?
- Work-based Learning in Athletic Training & Exercise Science
- CTE and the Future of Work
- ACTE 2019 Annual Report



Benefits of Following Career Interests

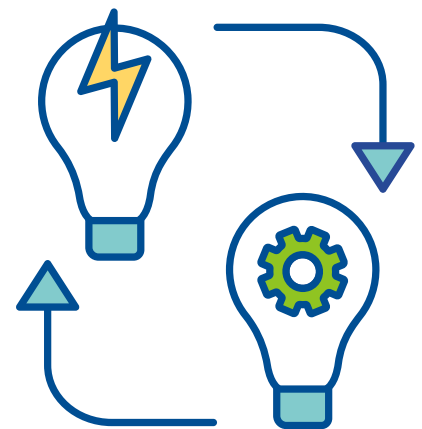


According to the most popular theory of career interests, Holland's RIASEC model, interests can be organized into six areas: Realistic, Investigative, Artistic, Social, Enterprising, and Conventional. Not only can a person's interests profile be defined by these six types, but work environments can also be classified into the same six categories.

Aligning one's work environments with his or her interests will not only increase satisfaction at work but also enhance the potential for achieving career success.

When a career is aligned with one's interest, they may have more motivation to devote effort into developing relevant knowledge and skills, set higher career-related goals, and take actions to achieve those goals.

All of these behaviors can help individuals improve their performance at work and enhance their career potential.



Source: <https://aai-assessment.com/blog/why-career-interests-are-important>

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“Research indicates that school retention, stability of choice of college major, and job satisfaction are significantly enhanced when individuals are able to align their **interests**, skills, and/or work values with occupations, programs of study, and jobs.”

Dr. JoAnn Harris-Bowlsbey
Executive Director of Product Development
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Table of CONTENTS

Entrepreneurship Education
as an Innovative Approach to Meaningful Work-based Learning

By Jason Delgado

16

WHY IS SPACE EXPLORATION IMPORTANT?

By Florence Gold

22

Laying the Foundation:
Work-based Learning in Athletic Training & Exercise Science

By Brian Howell & Tracy Smith

28

CTE and the Future of Work

By Ryan Major-Sells, Jessica Johnson & Scott Ruffolo

34

THEMES

- 16 Entrepreneurship Education as an Innovative Approach to Meaningful Work-based Learning
- 22 Why is Space Exploration Important?
- 28 Laying the Foundation: Work-based Learning in Athletic Training & Exercise Science
- 34 CTE and the Future of Work

FEATURES

- 40 ACTE 2019 Annual Report

UP FRONT

- 6 Leading Edge
- 8 Classroom Connection
- 10 Quality Counts
- 12 Leadership Matters
- 12 ACTE on the Move

IN THE BACK

- 54 Inside ACTE
- 56 Career Curve
- 58 Industry Connect
- 60 EVENTS CALENDAR
- 61 Crossword Puzzle



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- Stories of successful education and business collaborations across numerous program tracks

Submit your presentation at careertechvision.com

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EXPERIENTIAL LEARNING AT WORK

FOR DECADES EXPERIENTIAL LEARNING HAS BEEN A CORNERSTONE OF CAREER AND TECHNICAL EDUCATION (CTE). THERE ARE SO MANY EXAMPLES OF EDUCATORS EQUIPPING STUDENTS FOR careers through various methods of work-based learning (WBL). Career and technical educators offer students the opportunity to excel in hands-on, real-life experiences that enhance classroom instruction. But

how can we ensure all career and technical education students are benefitting from this value-added experience?

ACTE's *Quality CTE Program of Study Framework* outlines 12 elements and 92 criteria to support development of high-quality CTE programs; a voluntary self-evaluation tool and resources are designed to assist educators engaged in continuous program improvement. **Element No. 11, Work-based Learning, "addresses the delivery of a continuum of work-based learning involving sustained, meaningful interactions with industry or community professionals that foster in-depth, firsthand engagement with tasks required in a given career field.** Experiences may be delivered in workplaces, in the community, at educational institutions and/or virtually, as appropriate, and include a range of activities such as workplace tours, job shadowing, school-based enterprises, internships and apprenticeships."

What better way to provide and reinforce students' knowledge, skills and learning for their careers than through firsthand experiences in the "real" world.

This issue of *Techniques* promises to be engaging as we read about entrepreneurship education, the future of work, athletic training and exercise science, solving real-world problems with project-based learning via NASA HUNCH, and as we learn more about what high-quality experiential learning looks like in a growing career and technical education district.

Experiential learning! I reflected on my high school and college work-based learning experiences, which included entrepreneurial experiences, internships and placements. I can attest that WBL broadened and deepened my knowledge, understanding and skill base in agriculture and horticulture. I know many CTE educators with personal work-based learning experiences agree, and, today, they provide those same opportunities to their students.

Check out the articles in this issue and I'll also encourage you to learn more about element No. 11, Work-based Learning, in ACTE's *Quality CTE Program of Study Framework*; its nine criteria can help determine how you may (or may not) be offering your students real-life experiences in career and technical education. Equip your students with all the tools for college and career success via work-based learning!

Nancy J. Trivette
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CONGRATULATIONS TO THE 2019-2020 POSTSECONDARY LEADERSHIP SUCCESS PROGRAM AT ACTE – SPONSORED BY ECMC FOUNDATION FELLOWS!



Congratulations to the first cohort of fellows from the PLSP – ECMC Foundation for successfully completing their yearlong leadership development program. We are very proud of the fellows' work and engagement this past year, and we look forward to the further accomplishments of these leaders in Postsecondary CTE in the coming years!



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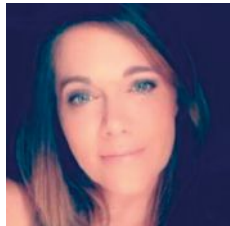
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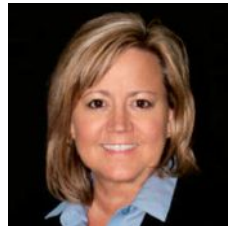
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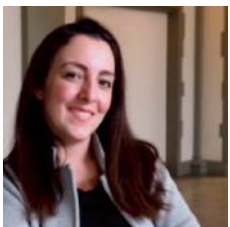
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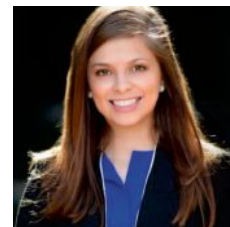
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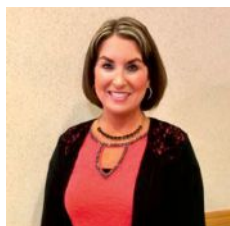
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The PLSP – ECMC Foundation Fellowship Program is a yearlong professional development experience intended to develop the organizational leadership and management skills of postsecondary CTE professionals, with an emphasis on addressing needs of underserved populations. Please visit www.acteonline.org/plsp-ecmcf for the continued development of this program and to see the accomplishments, updates and announcement of the second cohort which will be selected in January 2020.





WORK-BASED LEARNING IN A GROWING CTE DISTRICT

By Susan Leon

WHEN YOU THINK BACK TO ONE OF YOUR FIRST WORK EXPERIENCES, WHAT COMES TO MIND?

Were you anxious, nervous or even scared? Exposure to the unknown can be frightening to young students entering the workforce. Using work-based learning (WBL) as an essential component of a program can truly help to reduce or alleviate these fears. Not only do students get exposure to their chosen career, they also get a chance to hone professional skills and network.

Utilizing a scaffolded approach to WBL to prepare students for their profession is a proven method of transferring knowledge. A truly well-rounded opportunity involves mentorship, access to industry professionals, exposure to specialized equipment and on-the-job training. At

West-MEC, work-based learning is a major component of all programs and continues to evolve through the district's expansion. As West-MEC grows this aspect of our delivery model with high expectations in mind, the guiding parameters are the Arizona Department of Education work-based learning guide and the ACTE high-quality indicators for work-based learning.

In 2011, West-MEC began offering central programs on campuses. Since that time, the district has grown to include a total of 26 programs between four central campuses. The past three years have been a period of rapid growth, with several new programs offered to incoming students. As you can imagine, all have varying program

and industry requirements. The unique nature of each of our programs, paired with the industry challenges of work-based learning, are a focal point for the career and technical education (CTE) district moving forward.

Location, Location, Location

By September 2022, there will be more than 155,000 vacant construction positions in the state of Arizona (Greater Phoenix Chamber Foundation, n.d.). With such a large workforce gap, many industry partners are starting to see a need to explore outside-the-box ideas when vetting future employees. The West-MEC building trades program meets industry needs through a workforce pipeline, preparing and certifying students to enter the industry with a strong base of technical and professional skills.

Typical restrictions for West-MEC students include age, timing and location of construction jobs. Industry partners have noticed these challenges and are developing ways to overcome them. For the past few years, West-MEC industry partners have sent out company representatives to work directly with the students during their class time. The students learn the trade and gain exposure to industry. In addition, students who participate in industry competitions have received donations of machinery and personal protective equipment. Companies can utilize this as an opportunity to vet students as future employees, as well as to share career path opportunities within their industry.

Time Out

West-MEC students come from one of our 48 member high schools, typically taking classes at their home school at another time during the day. This requires them to find transportation to one of the district's central campuses. The hairstyling program sees nearly 120 students make their way to campus for programs beginning anywhere from 1:30–4:00 p.m. each day.

The Arizona State Board of Cosmetology regulates licensing for hairstylists

in the state, setting many different stipulations for the program, one of which is hours. Each student in a hairstyling program must have 1,000 hours of documented program time in order to sit for the licensure test. West-MEC divides these hours over the course of two years.

With that in mind, a major challenge facing teachers is scheduling. Second year students are tasked with running the salon, a true student-based enterprise (SBE). This requires that students know how to:

- Perform all services offered
- Run the front desk
- Actively recruit clients

Advanced students attend for 3 hours and 15 minutes each day the salon is open. Because the SBE can only run when the students are in class, scheduling has proven to be a significant hurdle. Students tend to take longer performing services because they are learning, and lengthy processes, like chemical or color services, are a challenge to complete in the given time frame. The hours the salon is

open also limits the prospective clientele because not everyone is available in the afternoon. The CTE district has responded to this challenge by scheduling staggered start times. This allows the salon to be open for a longer block of time to achieve complete services from start to finish.

Next Steps

Thinking on your current programs' work-based learning experiences, what are some successful practices? What are areas for improvement? Start by looking at your state or department of education level documents and laws. What must legally be in place to institute a successful work-based learning experience for your students?

Ensure that a focus of your work-based learning system is professionalism skills. In Arizona, there are nine standards with accompanying measurement criteria. Does your state or district offer the same guidance? How can this be embedded into a program to ensure students will be successful when participating in a work-based learning experience?

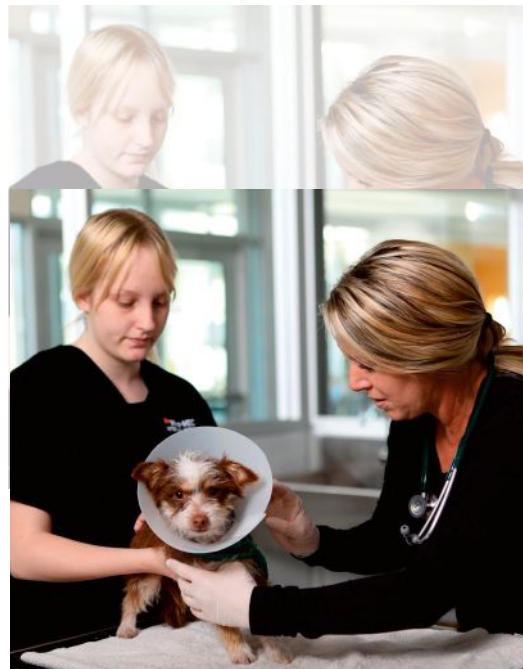
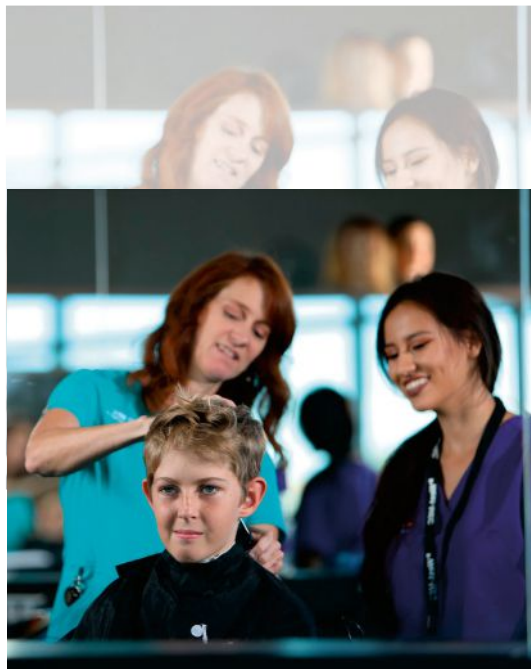
Criteria within ACTE's *Quality CTE Program of Study Framework* — one crucial element of which is Work-based Learning — offer a comprehensive look at what should be considered when evaluating a work-based learning system. You might also want to consider garnering feedback from multiple internal and external stakeholders.

With industry- and program-specific concerns in mind, career and technical educators are encouraged to develop a work-based learning system that will benefit students, industry and community partners, and the economy. ■

Susan Leon is a former classroom teacher and internship coordinator. She is a Curriculum and Instructional Specialist with West-MEC, one of Arizona's largest CTEDs, in the west valley of Phoenix. Email her at susan.leon@west-mec.org.

REFERENCE

Greater Phoenix Chamber Foundation. (n.d.). Invest today. Retrieved from <https://phoenixchamberfoundation.com/workforce-development/construction-collaborative/>.





WORK-BASED LEARNING

By Catherine Imperatore



WORK-BASED LEARNING (WBL) EXPOSES STUDENTS TO THE WORLD OF WORK, ENGAGES THEM WITH

employer mentors, develops their knowledge and skills, and brings learning to life. For these reasons, Work-based Learning is one of ACTE's 12 elements of high-quality career and technical education (CTE) within the *Quality CTE Program of Study Framework*.

The Work-based Learning element of ACTE's quality framework includes nine criteria that address the full continuum of sustained, meaningful interactions with industry or community professionals that foster in-depth, firsthand engagement with the tasks required in a given career field. The criteria listed below are from the 2018 version of the ACTE *Quality CTE Program of Study Framework*.

Criteria for Quality Work-based Learning

- a. A full continuum of work-based learning experiences, progressing in intensity, is accessible to every student at some point during the program of study.
- b. Work-based learning experiences are aligned with relevant national, state and/or local standards.

High-quality programs of study do not merely provide students with isolated workplace exposure, but rather work to develop a continuum of experiences that progress in intensity from workplace tours and job shadowing to school-based enterprises, internships and apprenticeships. Many states have defined, or are in the process of defining, the experiences appropriate for each learner level and for reporting or accountability purposes. This task of defining the range of WBL experiences is supported by national organization resources, such as the Linked Learning WBL continuum.

Ensuring that each and every learner has access to the WBL continuum requires intense collaboration with business and industry, across secondary and post-secondary partners and with middle and junior high schools, as WBL and career development activities are increasingly provided in the middle grades (a trend facilitated by Perkins V legislation). In addition, high-quality programs collaborate with career counselors and other education professionals, such as special education instructors and transition specialists, to determine appropriate WBL placements. A criterion in the Access and Equity element of the ACTE framework addresses removing barriers to WBL and other experiential learning opportunities.

In addition, workplace experiences must align with standards to ensure that they are relevant and aligned with the curriculum and with student goals. Many states, districts and institutions have developed these standards, and WBL standards have also been created by national groups such as the National Academy Foundation.

- c. Work-based learning experiences develop and reinforce relevant technical, academic and employability knowledge and skills.
- d. Work-based learning experiences are intentionally aligned with each student's education and career goals.

Through high-quality WBL experiences, learners develop and practice technical skills, using industry-standard technology and processes. Students also hone applied academic skills like reading and writing industry- and occupational-specific texts and — perhaps most importantly — they develop essential professional skills for communicating, collaborating and behaving professionally in the workplace.

WBL should be closely aligned with classroom-based instruction to help students move along their chosen education and career pathways. While workplace experiences that don't match their goals can still help students gain skills relevant across multiple industries and occupations, to the greatest extent possible, WBL placements should be specific to a student's program of study. Criteria in the Student Career Development element address communicating WBL opportunities to learners and their families and aligning WBL with students' individual education and career plans.

- e. Work-based learning experiences are provided through delivery methods that maximize meaningful interaction with business professionals.

Business and industry partnerships are fundamental to providing work-based learning. High-quality programs of study engage employers and industries in developing and evaluating WBL, as described in

the Business and Community Partnerships element of the framework, to ensure that students sustain meaningful interactions with business and industry professionals. This engagement most typically occurs in the workplace, where students can authentically participate as a member of the team.

However, in-person WBL may not always be possible or effective, particularly in rural communities. In these cases, districts and institutions can explore creative delivery models such as simulated or virtual WBL. For instance, West Virginia and Alabama have flipped WBL on its head through the Simulated Workplace model, which reorganizes CTE programs into school-based businesses. Business partners help develop and monitor these workplace environments for their realism and industry alignment. A criterion in the Facilities, Equipment, Technology and Materials element addresses maximizing student access to relevant tools and technology through flexible delivery methods, which may include in-person and virtual WBL.

f. Requirements and procedures for work-based learning experiences that address access, selection, liability, supervision, rights and responsibilities, safety, transportation, learning objectives and evaluations are formalized and shared in advance of work-based learning experiences with employers, students and parents/guardians (as appropriate).

g. Work-based learning experiences comply with relevant federal, state and local laws and regulations.

h. Work-based learning experiences are supervised by CTE staff with clearly defined roles.

Successful WBL requires standardized policies and procedures that communicate to students, families (if appropriate) and employers their respective rights and responsibilities and that address logistical and legal issues. These procedures must align with relevant labor and safety laws and regulations, particularly in K–12 education. To ensure access for all learners, programs should also consider supports such as transportation to the job site.

Form templates and other materials are

included in several state and nationally developed toolkits (found in our High-quality Tools online library section on WBL), as are publications that address liability concerns through such means as hold-harmless waivers, insurance and third-party intermediaries.

To organize this complex process, WBL experiences must be coordinated and supervised by instructors, counselors, WBL coordinators or other CTE staff with time, knowledge and resources to develop and implement high-quality WBL. Criteria in the Prepared and Effective Program Staff element and the Student Career Development element further address staff responsibilities and needs in this area.

i. Students engage in reflection and document learning resulting from work-based learning experiences, such as through a portfolio or presentation.

As with any type of learning, it is important to assess student development of knowledge and skills. For WBL, this evaluation may include student portfolios or presentations, as well as employer evaluations. This assessment process benefits the student, the employer and the program, as each learns what went well and what can be improved in the future, and serves to further align WBL to classroom-based experiences within the CTE program.

Success Strategy: Virtual Enterprise

At Granville County Public Schools, a rural district in North Carolina, students can participate in a virtual school-based enterprise through the Virtual Enterprises International (VEI) platform. As described in *Simulated Work-Based Learning: Instructional Approaches and Noteworthy Practices* (U.S. Department of Education, 2017), VEI is a nonprofit organization that provides schools with a web-based curriculum and network focused on developing skills in business, finance, marketing and IT. Business and industry partners serve as advisers to students as they run their own virtual businesses. These employer partners provide students with real-world problems and projects and give small grants and sponsorships to cover VEI expenses. Students learn about day-to-

day business operations, communicate with potential clients and customers, and market and sell virtual goods and services. In addition to the virtual component, the classroom itself is set up to look and operate like a business. VEI is credited with building students' leadership and employability skills, and Granville VEI students have been successful in state, national and international competitions.

Learn More and Assess Your Programs

Practitioners can turn to ACTE's High-quality CTE Tools online library for resources on workplace experiences. The WBL section features case studies, toolkits and publications outlining strategies to develop and implement various types of work-based learning, including apprenticeships, as well as tips on how to overcome access and equity challenges for various student groups and in the middle grades.

In addition, practitioners can use the *Quality CTE Program of Study Framework Self-evaluation Instrument* to assess a single program, or multiple programs across a district or institution, in relation to the WBL and all 12 elements of high-quality CTE. The rubric can be completed on paper or online, where users can receive automatically calculated scores, save and print their results, and be connected to the online library for areas identified as needing improvement. ■

Catherine Imperatore is research manager for ACTE. Email her at cimperatore@acteonline.org.

REFERENCE

U.S. Department of Education, Office of Career, Technical and Adult Education. (2017). *Simulated Work-Based Learning: Instructional Approaches and Noteworthy Practices*. Retrieved from https://www.gfcmu.edu/revup/documents/SWBL_Report.pdf.

EXPLORE MORE

High-quality CTE Tools Online Library: acteonline.org/high-quality-CTE

Quality CTE Program of Study Framework and Self-evaluation Instrument: acteonline.org/high-quality-CTE



JROTC: USING EXPERIENTIAL LEARNING TO DEVELOP EMPLOYABILITY SKILLS

By Michael Wetzel & Robert F. Barrow

MANY OF US HAVE BEEN TO HIGH SCHOOL FOOTBALL GAMES AND SEEN JUNIOR RESERVE OFFICERS' TRAINING CORPS (JROTC) CADETS PRESENTING COLORS; YOU MAY HAVE ALSO SEEN THEM IN PARADES AND OTHER LOCAL COMMUNITY EVENTS. JROTC PROGRAMS ARE WELL KNOWN FOR WHAT THEY DO IN THEIR SCHOOLS, COMMUNITIES AND FOR THE NATION. JROTC IS A PROGRAM SPONSORED BY THE DEPARTMENT OF DEFENSE, WITHIN WHICH THE UNITED STATES ARMY, MARINE CORPS, NAVY AND AIR FORCE ARE ALL REPRESENTED.

The mission: "To help young people become better citizens for their communities and nation."

But how? What goes on behind the scenes?

The JROTC classroom is an experiential learning laboratory.

JROTC instructors strive to equip students with the employability skills necessary for success in life after high school. It all starts the day a cadet enters the classroom. Cadets are encouraged to join teams, engage in community service, and to be actively involved on their school campus. By doing this, cadets are beginning the process of learning by doing.

Cadet Ownership

From the first day of their enrollment, cadets are encouraged to take ownership of their learning. Cadets view JROTC as more than uniformed discipline; it is an opportunity to develop leadership skills.

Cadets learn to become effective communicators as class and corps leaders. Cadets become effective team members by learning to complete community events as one unit. Cadets learn individual responsibility by wearing a uniform, maintaining grooming standards and understanding the consequences of their actions. Cadets learn to become critical thinkers through competition, which can include drill, marksmanship, orienteering, rocketry, academic bowls, and many other competitions held at the local and national levels.

By the time a cadet reaches their junior year, they will become recognized as leaders in a JROTC program; they have reached the pinnacle of their JROTC experience. They are now engaged in a simulated workplace environment. Instructors look to these cadets as leaders in classrooms; organizers of program events; communicators of program requirements; problem solvers for newer cadets; collaborators with instructors to ensure program goals are attained; and, finally, resource managers ensuring uniform and equipment accountability.

A cadet who has successfully completed any JROTC program is prepared to be successful in the workplace. JROTC instructors continue to provide mentoring and leadership to young women and men to better prepare them for life after high school.

JROTC is CTE.

One such area crucial for life beyond high school is employability skill development. Many states across the U.S. are beginning to appreciate the value of JROTC as part of career and technical education (CTE); one of these states is Alabama, where JROTC has been established as a career and technical student organization (CTSO) at the state level.

Unique to Alabama, this relative newcomer to the CTSO family, our organization is referred to as Alabama JROTC Officers Association; membership is highly coveted, and students must apply and compete for each academic year. Through the JROTC CTSO, cadets are learning skills needed for college and career readiness. The CTSO organizational structure is very much like any JROTC program, consisting of a student leader (commander), and key staff positions. It is, in essence, an existing CTSO leadership structure.

The selection board for the state officer positions is run entirely by cadets. The opportunity to serve at the state level prepares these talented young people for leadership roles in any future endeavor they pursue. The Alabama State Department of Education not only recognizes this orga-

nization, but the Alabama JROTC Officers Association also receives equitable treatment in terms of state officer professional development, retreats and participation in an annual Joint Leadership Development Conference for all CTSOs across the state. Cadets who serve as officers in the Alabama JROTC Officers Association also sponsor an annual JROTC Cadet State Conference, normally conducted on a college campus and led entirely by students!

It has been a resounding success and demonstrates our commitment to be full players within the CTE community! ■

Michael Wetzel is retired from the U.S. Air Force after proudly serving 25 years. After retiring, he began his second career as an Air Force JROTC instructor in south-

ern California. Wetzel again retired from teaching after 13 years to accept his current position as an instructional systems specialist in his home state of Alabama, where he has served in his current position for nine years developing curriculum for Air Force JROTC and working credit and accreditation issues. Email him at michael.wetzel.5@us.af.mil.

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Alabama JROTC Officers Association:
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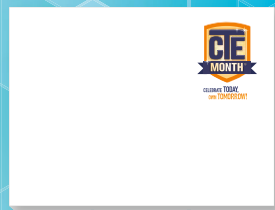
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Best Practices and Innovations Conference 2019

PROFESSIONAL DEVELOPMENT & COMMUNITY COME TO THE FOREFRONT FOR CTE ADMINISTRATORS

By Patrick A. Biggerstaff

PRESIDENT JOHN F. KENNEDY ONCE SAID, “LEADERSHIP AND LEARNING ARE INDISPENSABLE TO each other.”

If this is true, as I believe that it is, then professional development is as important for career and technical education (CTE) administrators as it is for program instructors. Continued learning, along with a healthy dose of inspiration, can help to ensure that CTE leaders enjoy long and impactful careers. While ACTE offers a great variety of learning opportunities through online programming at CTE Learn, in virtual meetings with Educators in Action, and through opportunities like the ACTE National Leadership Fellowship Program, targeted professional development conferences offer CTE administrators uniquely powerful learning experiences alongside their professional peers.

For more than 10 years, ACTE and its affiliate organization the National Council

of Local Administrators (NCLA) have co-hosted CTE leaders at the Best Practices and Innovations in CTE conference. In September 2019, amid a backdrop of cacti, agave plants and the Santa Catalina Mountains, roughly 500 CTE administrators met in Tucson, Arizona, to hone their skills and professional understandings. ACTE board of directors President Nancy Trivette attended for the first time this year, and she was impressed with the engagement of new and experienced attendees. When reflecting on the conference, she commented, “Best Practices is a very impactful conference. Participating CTE administrators represented a variety of locations, structures and experiences, and they consistently engaged one another in working to advance CTE opportunities.”

Dynamic Professional Development
NCLA President Jerome Brockway shared, “The Best Practices Conference provides dynamic, quality, innovative presentations delivered by active practitioners from

the field.” It was clear from the kickoff of preconference workshops that the quality of presenters would be second to none. Best-selling author Mark C. Perna led a session titled “Elite Training to Achieve Significant Enrollment, Retention, and Performance Results,” while author and ACTE board member Rachael Mann shared her thoughts on automation, virtual reality, globalization and other topics during a session titled “The Future of Work for the Martians in Your Classroom.” Not only are these individuals tremendous advocates for high-quality career and technical education, but they are also highly engaging and informative.

All Best Practices session offerings were targeted to the professional development requests of previous conference attendees. “Best Practices offers tailored content for CTE administrators in a boutique setting to foster authentic learning and networking experiences,” said ACTE’s Executive Director LeAnn Wilson. “With focused sessions addressing the most pressing CTE administrator issues, Best Practices helps attendees tackle teacher recruitment and retention, generate funding for CTE programming, and market and rally state, local and community support for CTE.”

Personally, I benefited from sessions centered on comprehensive career counseling, digital portfolios, teacher incubators and micro-credentialing. I also enjoyed hearing from speakers such as Kevin Fleming, author of the best-seller *(Re)Defining the Goal*; Cynthia Marble, senior consultant with SIGMA Threat Management Associates; and Lincoln Electric Business Manager Jason Scales. I attended a fun networking reception that allowed for interactions among secondary, postsecondary and industry professionals, and I also enjoyed some casual meals with colleagues like ACTE’s Administration Division Fellow Scott Rogers. I appreciate that the Best Practices conference provides time for discussion and reflection.

ACTE Administration Division member Eric Ripley said, “As a CTE administrator, I find great value in the professional development opportunities offered through ACTE and NCLA. Both in my own professional growth and in identifying strategies for

strengthening CTE programs, being active in professional development is critically important for any educational leader.”

Ripley added, “The Best Practices and Innovations Conference is focused on CTE administrators, offering speakers, breakout sessions, tours and exhibitors to highlight current and emerging topics pertinent to CTE leaders. But, above all else, it is the ability to have meaningful conversations with fellow CTE administrators from around the country that is the most impactful.”

A Place to Build Community

Like Ripley, I am a longtime member of the ACTE Administration Division, and I am grateful for the networking and professional development experiences that I have been afforded. The Best Practices and Innovations Conference, like ACTE’s CareerTech VISION and the National Policy Seminar, give me the opportunity to continue developing my skills and understandings while meeting

new colleagues and catching up with old friends. During this conference, one of my colleagues from the NCLA board introduced me to Asa Stone from Central New Mexico Community College. Stone is the only advanced cicerone in her state, which is a title akin to a beer sommelier. She is recognized as “New Mexico’s leading beer expert” (Clary Davies, 2019) and, with a Ph.D. in psychology, she teaches a course titled “Beers and Society” within Central New Mexico’s Brewing and Beverage Management Program. Not only did I find Stone’s experiences to be interesting, but our discussions also spurred my thinking about opportunities for my local culinary arts and hospitality programs.

“The Best Practices and Innovations conference leads to dialogue about best practices, strategies, program innovation and dynamic curriculum design,” said Jerome Brockway. I would add that conference experiences offer friendships, memories and the inspiration to help CTE

administrators grow in knowledge and effectiveness. I hope that you will plan to join your fellow ACTE administrators at the next Best Practices and Innovations in CTE Conference, to be held Oct. 7–9, 2020, in scenic Cape Cod, Massachusetts. ■

Patrick A. Biggerstaff is vice president of ACTE’s Administration Division and a practicing CTE administrator in central Indiana. Email him at patrick.biggerstaff@wayne.k12.in.us.

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EXPLORE MORE

More information about ACTE & NCLA’s Best Practices & Innovations in CTE Conference 2020 can be found online at acteonline.org/bestpractices/.

STUDENT VIDEO CHALLENGE

LIVING AND WORKING ON THE MOON AND BEYOND



- Celebrate the 50+ year anniversary of the Apollo 11 mission
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- Showcase a future scenario on the moon that incorporates CTE and/or project-based learning

Video submission deadline: March 2

acteonline.org/video-challenge



Entrepreneurship Education

**as an Innovative Approach to
Meaningful Work-based Learning**

By Jason Delgatto





n today's innovation economy — with needs and opportunities evolving faster and more fluidly than ever before — our youth need a mindset

that equips them to recognize opportunity, take initiative and innovate in the face of challenges. With economists predicting that the jobs of tomorrow don't even exist today (Millennial Branding, 2012), it is becoming increasingly clear that entrepreneurial skills are skills for life. NFTE (Network for Teaching Entrepreneurship) is an organization that believes developing an entrepreneurial mindset in every student is the solution. This can be accomplished through innovative work-based learning where students become immersed in an authentic experience as an entrepreneur themselves.

What is an entrepreneurial mindset?

Before being able to fully appreciate NFTE's approaches to work-based learning, it is important to understand what it means to have an entrepreneurial mindset first. Both anecdotal and academic research support the premise that entrepreneurs approach challenges and tasks in a unique way — with an entrepreneurial mindset. Research also suggests that an entrepreneurial mindset is not a fixed trait, but rather a set of skills and behaviors that can be taught, practiced and cultivated, and that having an entrepreneurial mindset lays a foundation for success throughout life (Garcia, 2015). Current research also shows that one in three U.S. employers is seeking entrepreneurial experience in new hires (World Economic Forum, 2016).

An entrepreneurial mindset is valued by employers, boosts educational attainment and performance, and is crucial for creating new businesses. Therefore, developing an entrepreneurial mindset becomes a critical component of career readiness beyond traditional business career tracks; this is applicable for any student in any field of study. Having an entrepreneurial mindset is a key to success whether a student pursues postsecondary education/training, acts 'intrapreneurial' as an employee, or becomes an entrepreneur themselves.

“In addition to practicing skills such as critical thinking and problem solving, this approach to meaningful interactions becomes a transformative experience for NFTE students. Students feel that their ideas have value when members of the business community come to the classroom to listen and engage in professional dialogue.”

NFTE has developed the framework for this quintessential entrepreneurial mindset, drawing on our depth of experience teaching entrepreneurship to young people. Working with researchers at the Educational Testing Service (ETS), and with signature support from Ernst & Young (EY), we designed the Entrepreneurial Mindset Index (EMI) to measure mastery in eight core domains that we have identified as critical to entrepreneurial thinking (Gold & Rodriguez, 2018). These eight domains include 21st century skills that

are sought out by employers (e.g., critical thinking and problem solving, creativity and innovation, communication and collaboration), as well as important transferable behaviors that are unique to the field of entrepreneurship (e.g., opportunity recognition and comfort with risk).

High-quality Work-based Learning

At the core of NFTE’s framework for growing a student’s entrepreneurial mindset is a high-quality work-based learning

experience, defined by ACTE (2019) as “involving sustained, meaningful interactions with industry or community professionals that foster in-depth, firsthand engagement in a given career field.” In a traditional approach to learning business or finance, students would have undergone a great amount of time learning about theoretical business content and how other business owners were successful by reading case studies. This may have culminated with an internship that was also not connected to the classroom ex-



Initiative & Self-Reliance

The power to take ownership without input or guidance and to work through obstacles independently.



Flexibility & Adaptability

The ability and willingness to change actions and plans to overcome present and future challenges.



Communication & Collaboration

The ability to clearly express ideas to an intended audience, including persuading others to work toward a common goal.



Creativity & Innovation

The ability to think of ideas and create solutions to problems without clearly defined structures.



Future Orientation

An optimistic disposition with a focus on obtaining the skills and knowledge required to transition into a career.



Critical Thinking & Problem Solving

The process of applying higher-level, process-oriented thinking skills, and of transitioning that reasoning to decision making.



Opportunity Recognition

The practice of seeing and experiencing problems as opportunities to create solutions.



Comfort with Risk

The capacity to move forward with a decision despite inevitable uncertainty and challenges.



Entrepreneur Daymond John visits an NFTE classroom.

perience, and students would be asked to perform administrative tasks.

By contrast, NFTE's approach is to have students act as the entrepreneur from the very first day. Every NFTE student uses innovative industry tools to develop a business around their own authentic ideas alongside actual entrepreneurs and members of the business community. NFTE students take a chance on their own business ideas in preparation for a series of investor pitches to earn actual funding for their business or to further their education; NFTE's approach to experiential learning centers development of an entrepreneurial mindset through a number of transformative work-based experiences.

On a daily basis, NFTE students work with real-life industry tools like the business model canvas and an investor pitch deck. With a business model canvas, students practice flexibility and adaptability as they are constantly testing and revising their ideas, doing more research and gathering more data. Students also practice communication and collaboration while

having to synthesize the information, from their business model canvas to their investor pitch, in a manner that is most effective for their intended audience.

NFTE students also work on authentic work products around their own unique business ideas that can be launched in real life. Instead of learning about how others define a path to success, students use their own opportunity recognition and creativity and innovation skills to solve a problem that they feel qualified to solve. This is a critical exercise for every student in any field of study. For example, students who want to pursue a career as a professional with their practice (e.g., lawyer, doctor) need to know how to manage their practice as a business in order to be successful. Even students who want to pursue a career in the arts need to know how to market themselves as a brand and what to charge people for their art or services. Every student in every career and technical education (CTE) track should go through the exercise of identifying a viable busi-

ness opportunity around their interests or desired career industry.

In addition, NFTE manages an extensive volunteer network to ensure students have multiple meaningful interactions with entrepreneurs and business professionals as guest speakers, business plan coaches, and business plan competition judges. Students are treated as the experts in their businesses — and they are expected to be able to discuss and defend their business decisions in multiple, ongoing interactions. These experiences include pitches to judges and investors at a classroom, school, regional, and national level, such as at NFTE's National Youth Entrepreneurship Challenge. In addition to enhancing skills such as critical thinking and problem solving, this approach to meaningful interactions becomes a transformative experience for NFTE students. Students feel that their ideas have value when members of the business community come to the classroom to listen and engage in professional dialogue around their business plan.

Entrepreneurship Education

as an Innovative Approach to Meaningful Work-Based Learning



Winners of 2018 NFTE National Youth Entrepreneurship Challenge

Real-world Knowledge & Skills

The business professionals in NFTE's high-quality interactions do not only have interactions with NFTE students in a classroom setting, but also generously invite students into their businesses so that they might further practice engaging in a professional setting. Not only do these longitudinal and meaningful interactions with the same professionals mean a deeper connection is made, but students feel more comfortable and might even envision themselves working in that professional setting one day. This approach also provides a unique opportunity for schools to better engage owners of small businesses and leaders from the surround-

ing community as well, further reinforcing the level of authenticity of the work-based learning experience.

NFTE offers numerous opportunities for internships and jobs to students through its network of corporate partners. Not only do these corporate partners have the opportunity to get to know many of the students who return later looking for employment, but they are also confident that an NFTE alum graduates equipped with an entrepreneurial mindset. To help students demonstrate what they have gained from the NFTE experience, NFTE has collaborated with Pearson Certiport on an Entrepreneurship & Small Business Exam certification. In addition, NFTE also collaborated with ETS on its Entrepreneurial Mindset

Index surveys that help a student reflect on the growth of their entrepreneurial mindset across their NFTE experience.

NFTE finds its robust and innovative approach to workplace learning translates to real-life employment gains. Recent surveys of former students showed that 86% of NFTE alumni are employed and 50% of NFTE alumni earn more than the median national salary. Furthermore, 89% of NFTE alumni felt NFTE contributed to their knowledge, skills and personal development.

In celebrating unique approaches to work-based learning, NFTE feels its innovative model of having students engage with a number of business professionals on authentic real-life work products captures

the spirit of experiential learning at work in ACTE's *Quality CTE Program of Study Framework*. Developing an entrepreneurial mindset is a core component of any effective work-based learning experience, and teachers of all fields of study, from auto repair to engineering, and cosmetology to culinary, should consider integrating experiences that activate their students' entrepreneurial mindsets. Schools and districts should also think more innovatively around workplace learning that includes engaging local entrepreneurs in an industry of study, as well as broadening the workplace learning experience from traditional field trips and internships. The quality of our future workforce will depend on career and technical education taking these steps toward teaching every student to think and act like an entrepreneur. ■

Jason Delgatto is the senior director, curriculum & professional development for NFTE (Network for Teaching Entrepreneurship). Joining the NFTE team in 2009, Delgatto has played an integral role in the development of instructional resources designed to activate a student's entrepreneurial mindset. This includes the authoring of NFTE's 12th edition *Owning Your Future* textbook and the creation of its next-generation courses in NFTE's Entrepreneurship and Small Business Pathway. A native of Chicago, his experience includes teaching physics in Chicago Public Schools and receiving a master of arts

in curriculum studies from DePaul University. Beyond his time developing and implementing professional development around NFTE's courses, Delgatto's experience extends to professional development creation and instructional coaching for divisions of Pearson and Kaplan Academic Tutoring. Email him at jasond@nfte.org.

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About NFTE

Founded in 1987 in New York City, NFTE activates the entrepreneurial mindset and builds startup skills in youth from under-resourced communities, to ensure their success and create a more vibrant society. NFTE offers schools and partners a unique combination of high-impact student programs with exceptional teacher training and support. Students are guided by NFTE's expert Entrepreneurial Teacher Corps and supported by NFTE's extensive network of entrepreneurs and business leaders who volunteer as classroom speakers, field trip hosts, business plan coaches, and competition judges. More information about NFTE and the Entrepreneurial Mindset can be found at nfte.com.

“Teachers of all fields of study, from auto repair to engineering, and cosmetology to culinary, should consider integrating experiences that activate their students' entrepreneurial mindsets.”



WHY IS SPACE EXPLORATION IMPORTANT?

By Florence Gold

Space exploration is a means to discovering more about our universe. It is a means of sparking imagination and curiosity in each human being, young and old. NASA has inspired generations of students to study and seek careers in the areas of science, technology, engineering and mathematics (STEM).

In 2003, NASA engineers Stacy Hale and Robert Zeek had a novel idea: Maybe high school students could build training hardware for the astronauts. Since then Hale and Zeek, along with a team of outstanding engineers, have worked endlessly to involve high school students in the fabrication of needed training and flight items as part of the High School Students United with NASA to Create Hardware (HUNCH) program. The HUNCH program's mission is to engage career and technical education (CTE) students in developing 21st century skills that promise to benefit themselves, NASA and the nation, leading the world in innovation.

Engaging the CTE Community

HUNCH students in CTE classes — in four time zones, in more than 200 schools — are designing and fabricating a wide range of beneficial items for NASA. The scope of these projects has expanded from single stowage lockers to such projects as the galley table, where astronauts onboard the International Space Station (ISS) enjoy eating entrées from recipes developed by HUNCH culinary students. Currently, there are six categories of NASA HUNCH projects, which include:

- Precision Machining: Flight and training hardware
- Softgoods: Flight and training sewn items
- Design and Prototype: Designing valuable products for space
- Design Development for Flight: Finalizing the drawings and prototypes for flight
- Food Science: Culinary Challenge
- Communication: Video challenge

WHY IS SPACE EXPLORATION IMPORTANT?

Students in a wide variety of CTE classes participate in these projects: manufacturing, engineering, science, technology, computer programming, family and consumer sciences (FCS), fashion design, culinary and video/media, among others.

NASA HUNCH Manufacturing Projects

Manufacturing projects involve classrooms with computer numerical control (CNC) machines and/or other manufacturing equipment. Students are tasked with the fabrication, documentation and assembly of precision flight hardware for NASA. In order to meet this goal, students must not only apply their knowledge of operating the machinery, but also their innovative problem-solving skills to construct and document the parts according to NASA's stringent requirements.

Individual manufacturing classes are assigned parts to produce according to the equipment they have available and their curriculum. A NASA mentor is assigned to the school to support the fabrication of the parts; this mentor assists with the reading of the NASA drawings and provides the consumables. They also provide guidance on finishing the parts' surfaces and documenting the parts.

NASA HUNCH Design and Prototyping Projects

Teachers in engineering, science, technology, mathematics, drafting (and more) courses incorporate HUNCH projects into their varied curricula by devoting time for students to apply their learning to design and fabrication. This is often done within a class period several times a week or as part of a club that meets before or after school.

At the beginning of each school year, students are presented with 10 projects from which to choose, all challenges to be solved in the name of space exploration. Students work closely with their HUNCH mentors and NASA engineers to develop a product that will meet the requirements and constraints of their projects. Students learn to work in teams, and they use creative problem-solving skills to think outside the box when fabricating prototypes of these needed items for NASA.

Students are required to attend, either virtually or in person, design reviews wherein they present their prototypes to HUNCH mentors and NASA engineers. A final review is held each year in Houston, Texas, for the teams who produce the top prototypes. This opportunity allows students from all over the country to share their ideas with peers as well as with NASA engineers and astronauts at Johnson Space Center.

NASA HUNCH Softgoods Projects

Softgoods are sewn products that help to meet the limitations of size and weight for items sent to the ISS. Students, primarily in fashion design and other FCS classes, design and fabricate such items as cargo transfer bags (CTB), crew quarter organizers and food pantry containers as part of their curriculum.

NASA HUNCH supplies the material, consumables and, when needed, industrial sewing machines. Instructors and students work closely with our softgoods project managers to ensure that their final sewn products meet NASA's flight and training requirements. An annual workshop for softgoods teachers is held in Houston, Texas.

NASA HUNCH Culinary Challenge

The HUNCH Culinary Challenge involves students in a variety of CTE courses and clubs; participation is not limited to those enrolled in culinary classes. Each year astronauts decide on a different entrée for HUNCH students to develop. Students are required to incorporate specified nutritional requirements as well as special requirements of storing and eating food in space.

Students participate in regional culinary evaluations in February and the top 10 teams are invited to Houston, Texas, in April to present their entrées to NASA food lab personnel, NASA employees and even astronauts. The Johnson Space Center food lab processes the winning recipe for the astronauts to enjoy on the ISS. In 2018, the astronauts onboard the ISS were treated to an orange blackberry croissant and they commented that they would love to have this dessert incorporated into their regular menu.

NASA HUNCH Design Development for Flight

We have received many requests for student-designed prototypes from NASA and, to meet that need, we created this new project. Selected HUNCH teams will develop final drawings and prototypes — derived from NASA HUNCH design and prototyping program projects — of such valuable tools as tape dispensers, vacuum brushes and advance exercise cable covers for the International Space Station (ISS).

From a student themselves

“When I started in the NASA HUNCH program while attending Clear Creek High School, I never would have imagined the career-defining impacts the program would have on me and my career. For me, the NASA HUNCH program has been able to develop and foster a passion for STEM education within me, and it caused in me a burning desire for higher education.”



WHY IS
SPACE
EXPLORATION
IMPORTANT?

From a student themselves

“Currently, I am studying electrical engineering at the University of Houston while working as a team member of the newly formed NASA HUNCH Design Development for Flight Team. However, this would never have been a reality for me had it not been for my involvement in the program throughout high school.”

For 2019–2020, the NASA HUNCH–CTE Month video challenge is expanded to include students in middle school, high school and those enrolled in postsecondary programs. The theme is *Living and Working on the Moon and Beyond*. The guidelines and past video submissions can be found on ACTEonline.org and also at nasahunch.com.

Students and teachers should register for this challenge by **Feb. 4, 2020**. The deadline to submit videos is **March 2, 2020**.

NASA HUNCH–CTE Month® Video Challenge

NASA and the Association for Career and Technical Education (ACTE) have partnered to present a video challenge that encourages students to create two-minute videos that inspire other students to study and pursue careers in STEM.

A Win-win Situation

The relationship between NASA and schools is a win-win situation: All of the aforementioned projects, designed by students to meet NASA's needs, have saved NASA millions of dollars.

Students win, given an incredible educational opportunity to apply their learning in CTE courses and practice essential 21st century skills. Students also are encouraged to list their NASA HUNCH experience on resumes or applications for jobs or colleges. NASA, industry and academia all win because HUNCH students are well

prepared to enter the workforce or postsecondary institutions. ■

Florence Gold, Ed.D., has worked with the NASA HUNCH program since January 2005, first as a HUNCH teacher and for the last 12 years as the NASA HUNCH implementation project manager. Email her at florence.v.gold@nasa.gov.

EXPLORE MORE

For general information and how to apply to the program: nasahunch.com

For the Design and Prototyping Project: hunchdesign.com

For the Culinary Challenge: hunchculinary.com

For the NASA HUNCH–CTE Month video challenge: acteonline.org/why-cte/cte-awareness/cte-month/cte-month-2020-and-nasa-hunch-video-challenge/

CREATE

Each student who participates in the NASA HUNCH program learns this acronym, CREATE, where each letter represents an important skill.

C

IS FOR CREATIVITY:

Hands-on, project-based learning stretches students' ability to think creatively. Innovative problem solving is required because of the unique issues that arise from applying your learning to a microgravity environment.

R

IS FOR RESILIENCY:

Students learn perseverance and to reflect on mistakes as learning opportunities. NASA has a famous saying: "Failure is not an option."

E

IS FOR SELF-ESTEEM:

By helping others, students build self-esteem. Supporting NASA by working on truly challenging issues definitely builds students' self-esteem.

A

IS FOR APPLYING YOUR KNOWLEDGE:

Most curriculum standards, no matter what the subject area, include a statement for students to apply their learning to a real-world situation. While working on NASA HUNCH projects, students are required to apply their learning by integrating subject areas horizontally across varied areas such as English, communication, marketing, graphics, business and STEM.

T

IS FOR TEAMWORK:

Most students mention teamwork when asked what they learned while participating in the NASA HUNCH program. In order to succeed, students must work in teams and learn to collaborate and compromise.

E

IS FOR HIGH EXPECTATIONS:

It is amazing to see how students not only meet, but exceed expectations when given the opportunity to take ownership of truly challenging and valued tasks.

These gifts are critical for the success of students no matter what 21st century career they pursue.



Editor's note:

On Monday, Oct. 14, 2019, *Techniques'* Managing Editor Lia Milgram accompanied Florence Gold to witness presentations from NASA HUNCH Design & Prototyping students at Glenelg High School in Glenelg, Maryland. Senior students in Raymond Gerstner's engineering class work in teams to develop tools that will improve the quality of life (and science!) on the International Space Station and beyond. Tools such as:

- Tongs for the collection of space rocks on the moon
- A stiff lunar brush to remove dangerous dust and debris

- An agitator for a microgravity washing machine with a very small footprint
- Wheels made durable enough to withstand the terrain of the moon

On that warm fall morning in the mid-Atlantic, Gerstner's students had prepared research and drawings to support their progress; they demonstrated how their proposed prototypes could be useful in space, and how they might also benefit man on earth.


The presentations were, in a word, "Stellar!" And made possible by NASA HUNCH.

“If it weren't for space exploration, we wouldn't have cell phones. We wouldn't even know climate change existed.”

Laying the Foundation:

Work-based Learning in Athletic Training & Exercise Science

By Renae Bomar & Travis Smarelli



The nuances of the ever-evolving American health care system — its organization and administration, education models and employment opportunities, and patient diversities and needs — can be taught in a multitude of ways. Inspection and comparison of professional educational programs across health care fields (e.g., nursing, athletic training, physical therapy) note a critical observation: The majority of programs include an internship or clinical education component (Hand, 2006). Why not bring this foundational educational component to the secondary school setting? What would a successful program look like? What, if any, challenges would exist? How would these challenges be addressed?

The athletic training/exercise science program at Central Nine Career Center in Greenwood, Indiana, is an example of a successful health care work-based learning program. Together, a general course and career center description along with a detailed curriculum plan provide a holistic understanding of the program and its environment. Important points to ponder are offered to illustrate program successes as well as areas of challenge, in hopes that others can draw from this program's experi-

ence and create effective changes in their CTE programs and students' success.

General Course Description

Health Science Education II: Athletic Training/Exercise Science is a yearlong extended laboratory experience at a qualified clinical site designed for students to observe and shadow a professional in the field. Tuesday through Friday, students complete 15 hours of internship experience. In the classroom component (on Mondays), students learn about the various careers and important topics in athletic training and exercise science, including information on employment opportunities at a variety of entry levels; an overview of human anatomy and physiology and health care delivery systems; health care terms and current evidence-based practices; and legal and ethical considerations. It prepares students with the knowledge, skills and attitudes essential for exposure to careers in athletic training and exercise science. Successful completion provides students with four high school credit hours and three college dual-credit hours. Recommended prerequisites include Health Science I, or comparable science core/electives.

Laying the Foundation:

Work-based Learning in Athletic Training & Exercise Science

Career Center and Students

Central Nine Career Center is a seven-building campus that offers 27 programs in seven different areas of study. These professional programs offer college credit, certifications and other resume advancement opportunities. Partner schools include nine public high schools and two private Christian high schools from the Southside suburbs of Indianapolis, Indiana. Students generally hail from a middle class socioeconomic status, and are juniors and seniors. Athletic training/exercise science program-specific students are generally seniors involved in athletics; they have jobs and are able to drive.

Coursework and Classroom Component

Students meet on the Central Nine campus once a week, during which time they learn a variety of health-care-related topics via projects, class discussion, guest speakers and field trips. Reflection papers (RPs), similar to journals, are completed on specified course topics throughout the school year. These RPs are 600 words and designed to facilitate thoughtful reflection and experiential learning. RPs and class projects compose 70% of the students' total class grade.

In the fall semester, the focus lies in orienting students to the class and their internships; reviewing human anatomy, physiology and medical terminology; and introducing the scientific research process. Five major projects are assigned to assist the students with establishing a career path and understanding the research process. Project No. 1 helps identify suitable careers. Students complete a personality assessment, and they then research careers associated positively with those personality traits. Students are tasked to research five job postings, each, for two career fields, and they write a short report about trends and patterns within those careers, and how this information relates to the class and their internships.

Project No. 2 looks at successful traits and skills associated with their internships, and starts students thinking about organizational hierarchy. Students interview their internship supervisors using questions carefully created during class. After the interview, students are asked to reflect on the answers and report key takeaways. Project No. 3 has students formalize and report their college application process and postsecondary plans. Finally, students work the whole semester to create the first three chapters of a scientific research manuscript (introduction, literature review and methods sections); much class time is dedicated to teaching the research process and the components of a quality project.

The spring is designed to be less project heavy and covers higher-level health care concepts such as physical training and conditioning; pharmacology and substance abuse; tissue healing and common orthopedic injuries; rehabilitation;

psychological aspects of injury; legal, ethical, and insurance issues in health care; and health care organization and administration. These topics lend themselves well to field trips. Students also have the opportunity to get certified in CPR/AED usage.

Project No. 4 deepens knowledge about personal insurance needs, positive and negative health behaviors, and disease prevention strategies. Students create educational brochures on these topics and learn how to establish healthy behaviors as young adults. Project No. 5 pushes students to be wise consumers as they evaluate credit buying, develop personal budgets (based on their postsecondary plans), and identify legal services they may use as adults.

Mock interviews are also conducted in the spring to get them ready for job and college program applications. These interviews also count toward a work ethic certification at graduation. As in the fall, a research project is completed throughout the semester. A critically appraised topic paper assists students in understanding how to implement evidence-based practice as a health care provider. Students evaluate and use the best three to five articles found during the fall research project to answer a question specifically related to the diagnosis and treatment of a patient or population.

Internships

Internship sites are chosen by the students. Generally, these sites are near their homes, schools or jobs within the southern Indianapolis area. These include but are not limited to athletic training facilities, physical therapy clinics, strength and conditioning (athletic performance enhancement) services, YMCAs and CrossFit gyms (general fitness and wellness), and physical education classrooms. Once internships have been established, they run Tuesday through Friday until the last week of school. Students are allowed to set their own schedules due to athletic and work responsibilities and the nature of their internships (many are second shift hours, 3:00–11:00 p.m.). Fifteen hours per week are expected and tracked with time sheets and weekly visits from the course instructor. Practical experiences such as these serve many purposes, aside from experiential learning. Students are able to find professional mentors and network, as well as explore career options.

The internship portion of the course is 30% of the total course grade. This includes completing the appropriate training plans/agreement forms, evaluations (self-evaluation, supervisor of student and student of supervisor), biweekly time sheets, and the IMPACT initiative (job skill implementation). Evaluations are completed twice a semester (mid-term and end of semester).

Other Incentives

As noted, other incentives enhance the Athletic Training/Exercise Science program at Central Nine Career Center. The IMPACT initiative (integrity, motivation, professionalism, adaptability, communication, and teamwork) recognizes and rewards students who continually do outstanding work within the career center. However, it is not just about academic successes. It's also about encouraging the smaller everyday successes that make students realize their own accountability, dedication and innovation. A group of faculty members known as the Positive Behavior Interventions and Support Team (PBIS) has created IMPACT Tickets, which Central Nine staff uses to reward students who personify IMPACT values. These tickets get placed into drawings where students can win various prizes, and they provide the opportunity to celebrate everyday successes during the end-of-the-year parties. In 2019–2020, high grades, good attendance and zero discipline referrals will be celebrated with donut and pizza parties for students.

Work ethic certification (also known as the Governor's Work Ethic Certificate) demonstrates the employability and character skills needed to be successful after leaving high school. Seniors who opt in create a résumé, build interview skills, complete community service hours and make connections with community members. Completion of program requirements results in receiving a certificate signed by the governor, a sash to wear at graduation, incentives and opportunities from the community, résumé-building opportunities, and other appropriate recognition.

National Technical Honor Society (NTHS) is an honor society for outstanding career and technical education (CTE) institutions in the United States, and helps schools recognize students for their achievement in CTE. Members receive a membership certificate in a professional presentation portfolio, an official NTHS diploma seal, graduation tassel, lapel pin and a window decal to show their affiliation. Interested students must apply for membership, and they have the opportunity to hold an office in Central Nine's chapter.

Established in 1976, HOSA – Future Health Professionals, formerly known as Health Occupations Students of America, is an international student organization recognized by the U.S. Department of Education and the Health Science Education (HSE) Division of ACTE with a twofold mission to promote career opportunities in the health care industry and enhance the delivery of quality health care to all people. The organization serves secondary, postsecondary, adult and collegiate students enrolled in health science education and biomedical science programs or who have interest in pursuing careers in health professions. Students have the opportunity to join the Central Nine chapter, become officers, and participate in state, regional, and international skills and educational competitions (HOSA, 2019).

Important Points to Ponder

This program is influential in preparing students for careers in health care, developing in them college and career readiness as well as vital employability skills. The blend of coursework and internship expectations promotes independence, time management and critical thinking abilities necessary of successful clinicians.

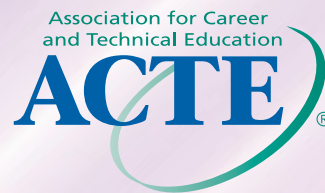
Quality internship supervisors model successful behavior, reinforce knowledge, and help keep students within their scope of practice of recognition (of injury or illness) and referral (to the appropriate professional). The class projects and project-based teaching techniques offer unique opportunities for English and math integration, and these relate course content to the students' future careers and life as an adult.

This program is driven by community connections and support, integrative teaching, and knowledge of career and collegiate requirements. A knowledgeable, supportive advisory board is helpful in creating community connections and internships, assisting with program marketing and events, and keeping the curriculum current and meaningful. It is important to have a diverse advisory board representative of all the program stakeholders (i.e., students, parents, industry professionals and educators). Additional support comes from student service coordinators, partner school counselors and deans of students. These individuals are influential in student enrollment and discipline and parent and guardian communication — important aspects of classroom management and student success.

There are potential challenges to be mindful of as well. Class size and geographic location can make it difficult for students to find meaningful internships. Larger classes (more than 15 students) tend to be hard to manage. Career centers near the inner city or in rural areas could limit internship options. One unique challenge for this particular career center is the large presence of collegiate athletic training and exercise science programs. Although it presents a great opportunity for high school students to interact and learn from college students currently enrolled in these educational programs, many sites choose to only offer internship opportunities to the college students.

Finally, because students are involved in athletics, have jobs, or may have transportation issues, the internship opportunities need to be flexible. During this academic year, this program will implement student interviews at the end of the enrollment period, during which students will meet with the instructor to review the internship expectations, and they will begin work to secure an internship prior to the start of the following school year. Student interviews can not only set

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Laying the Foundation:

Work-based Learning in Athletic Training & Exercise Science

the students up for successful internships, but they can also assist the instructor with discipline, or dismissal from the program, should the students fail to live up to the discussed expectations.

Finally, marketing is an important aspect often overlooked. Central Nine's marketing coordinator works diligently on social media, creating promotional materials, and coordinating events and stories with the media, partner schools and community supporters. Student service coordinators also play a big role in program marketing. These individuals coordinate events with middle schools, partner schools and community supporters; they also help coordinate summer camps to educate and introduce students to Central Nine.

Creating a successful work-based learning program is not without challenges, such as finding appropriate internships, marketing, and working with busy student schedules. But creative problem solving, a supportive advisory board and administration, and a strong focus on the students' holistic education: These are foundational ingredients.

Renae Bomar, Ed.D., has taught athletic training/exercise science for three years at Central Nine Career Center. Bomar has previous experience teaching athletic training at the collegiate level, and has provided athletic training services at the middle school, high school and collegiate ranks. She also is a certified strength and conditioning specialist. Email her at rbomar@central9.k12.in.us.

Travis Smarelli has been a certified athletic trainer since 2010 and also has a master's degree in exercise science and a master's in business administration with a focus on health care. He has worked at the college and high school levels. Email him at tsmarelli@cpcsc.k12.in.us. ■

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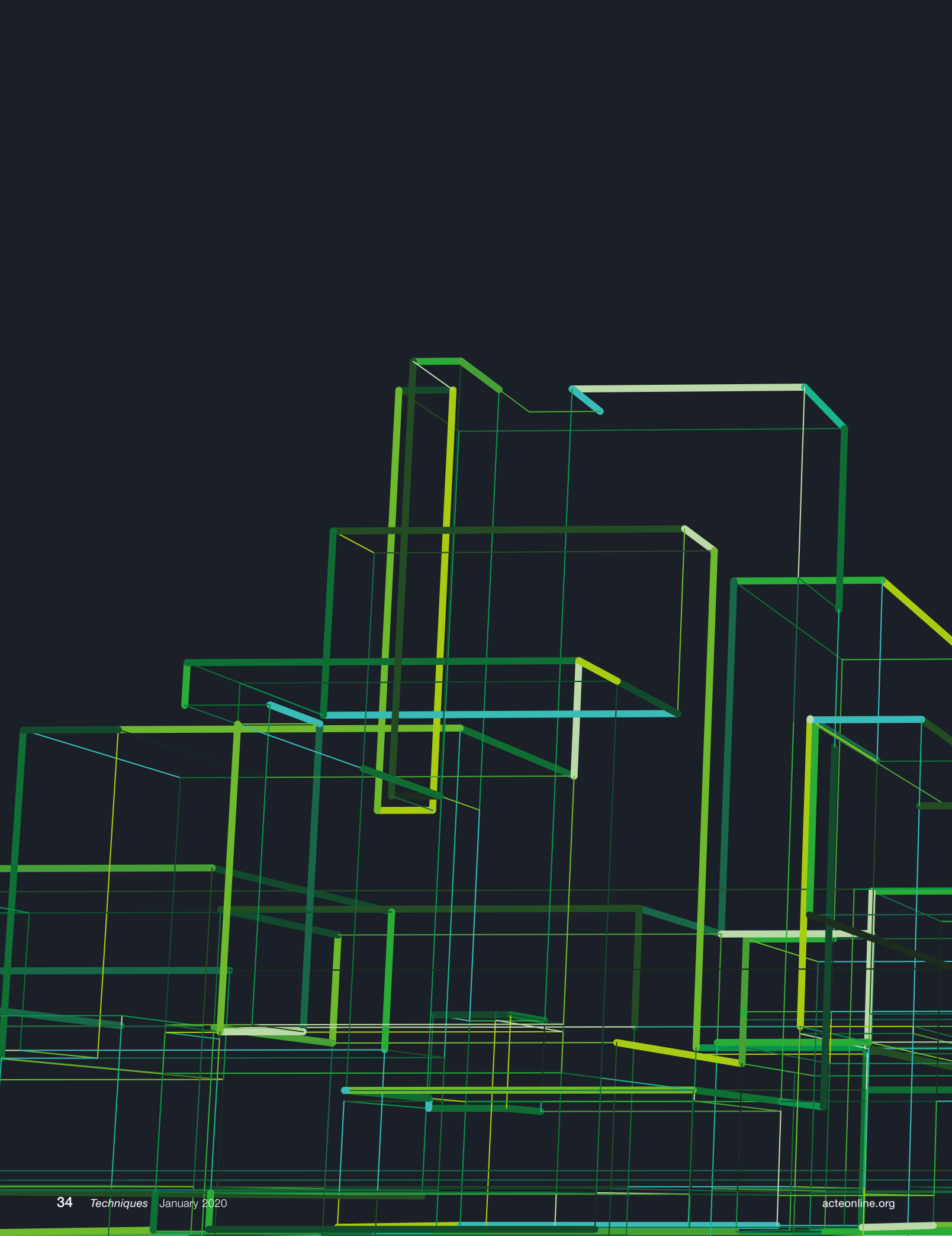
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CTE and the Future of Work

By Joyce Malyn-Smith, Jessica Julison & Sarah MacGillivray

A

major transformation is taking place in America's workplaces. The National Science Foundation calls it the Future of Work at the Human-Technology Frontier (Mervis, 2016) — a future that is driven by combinations of machine learning, artificial intelligence, the “internet of things” and robotics. Today's students will need new sets of skills, knowledge and dispositions to succeed in workplaces where technologies are partners with humans in the problem-solving process. The career and technical education (CTE) community is already giving students a head start in preparing for the future of work. But one key challenge involves predicting the multiple directions in which the workplace is heading and reconfiguring CTE to keep pace. In this article, we provide a glimpse of the changing world of work shared by industry specialists in high-tech fields, and we spotlight strategies the CTE community can use to prepare students to thrive in that world.

“What does work look like at the human-technology frontier and what skills, knowledge and dispositions do you look for in employees?”



Students travel to participate in a Ford STEM challenge.

The Shifting Landscape

At Education Development Center (EDC), researchers and practitioners are exploring what it will take for our students to succeed in work at the human-technology frontier. To better understand the future of work and the intersection between humans and technology, we asked experts in high-tech firms, national defense, aeronautical engineering and space travel, “What does work look like at the human-technology frontier and what skills, knowledge and dispositions do you look for in employees?”

These specialists shared the following characteristics of workplaces at the human-technology frontier (Malyn-Smith, Blustein, Pillai, Parker, Gutowski, & Diamonti, 2017):

1. Convergence of technologies and disciplines will bring about a predominance of dynamic, interdisciplinary teams, with members contributing deep content knowledge, technical skills and synthesis while people move fluidly in and out of projects.
2. Artificial intelligence (AI) and machine learning will enable machines to “understand” complexities more quickly than humans. AI will touch every aspect of our lives. At work, AI will become part of every major project.
3. Continuous streams of data between and among humans and machines will require skills in synthesis, analysis and interpretation of relationships among data sets. Data publicly available within minutes of capture will accelerate the pace of innovation and change.
4. Design and systems thinking will provide a common language and process

“As the pace of change increases and new technological innovations disrupt and evolve the workplace, it is clear that the fundamental ways schools approach student learning must change.”

for engineers and team members from other disciplines to define a problem and develop pathways toward a solution, with an understanding of the context and interactive components of a challenge.

5. As both humans and machines evolve, the boundaries between what machines do best and what humans do best will continue to blur. Machines will become partners with humans in the problem-solving process, not merely tools to be used to solve problems.
6. With the power of technology at our fingertips and machines as partners in problem solving, “computational thinking” (Wing, 2006) — thinking like a computer scientist — will predominate the workplace.

In addition to these characteristics, experts highlighted the importance of cybersecurity, education and training emphasis on solving authentic real-world problems, an ongoing focus on lifelong learning and learning to learn, and the importance of ethics in understanding unintended consequences. The shared expectation is that the highest-growth occupations and industries will be STEM-focused, or at minimum require dispositions and skills that can be put to use in a STEM context.

Strategies to Prepare Students for the Human-technology Frontier

Very few, if any, of today’s students are ready for the workplaces that industry specialists describe. Developing the dispositions and skills required to succeed in the future is no small task for districts working within a system that has been designed for the industrial era, rather than an era defined by AI and

machine learning. As the pace of change increases and new technological innovations disrupt and evolve the workplace, it is clear that the fundamental ways schools approach student learning must change. Federal and state education and workforce development organizations will need to get out in front of the wave and anticipate what students will need to know and be able to do three, five or 10 years from now to be empowered and successful adults.

Our EDC team interviewed CTE educators and leaders to identify the actions they are taking to reshape education to prepare students for the future of work. They shared strategies used to build students’ skills and dispositions in key areas described by the industry specialists:

- Interdisciplinary teamwork
- Design and systems thinking
- Lifelong learning
- Real-world problem solving

Many of the strategies build students’ skills in multiple areas simultaneously.

Interdisciplinary Teamwork

At Florida’s Spruce Creek High School, the Academy of Information Technology and Robotics’ (AITR) project-based curriculum offers an example of how schools might prepare students for a workforce that calls for interdisciplinary teamwork — demanding versatility, flexibility and collaboration. Partnering with Teledyne Marine, an underwater telecommunications manufacturer, teams of students work to develop improved manufacturing processes.

Teacher Janet Cunningham said, “This type of curriculum fosters teamwork

and collaboration to build employability skills while also providing the necessary core subject state standards in an environment where students see true connections between subject areas. While students are researching, taking notes, writing reports and creating presentations about various elements of the cabling, their work is meeting English standards. Doing the same work, they are also meeting standards in science, engineering and math.”

Elk Grove Unified School District Program Specialist Sue Hubbard noted, “We try to have educators working together to see across disciplines; [students] don’t go into work as an English person or a history person. Education puts content in one discipline or another, but in the real world we don’t work in one discipline.”

Design and Systems Thinking

Elk Grove’s Innovative Design Engineering Academy uses Ford Next Generation Learning’s (Ford NGL) Community Connected Learning framework, developed in partnership with EDC, to teach students how to use design thinking, systems thinking and project management to unpack and develop solutions to challenges from business partners like Sacramento Municipal Utilities Development.

“These skills are key,” said Hubbard. “Students have to practice empathy, do environmental scans, determine who stakeholders are, what the environmental impact is. They have to look at data and develop a potential solution that might address the problem. That’s how innovation happens. They will be fine wherever they go, because in industry



AITR students have a block schedule with dedicated time for technology use.

they will be the people others go to — they will be the ‘idea person.’”

“We are training our students for jobs that don’t even exist yet,” observed Tammy Epperson, assistant principal at Central Florida Aerospace Academy. “We are training them in content areas, but also training them to be problem solvers, to think, to learn, to approach new situations and work through problems that come up.”

Lifelong Learning

In the face of changing markets and economic demands, Jay Steele, president of the National Career Academy Coalition (NCAC), strongly advocates for the development of graduates capable of lifelong learning, flexibility and adaptability.

“It doesn’t help students to prepare them for a career in which there is no future,” said Steele. “Districts have to be prepared to make changes in response to workforce trends, and students have to have the skills to learn how to learn — how to apply skills they have learned in new situations.”

Grand Island Public Schools, an NCAC partner school, has an innovative approach to preparing their students for a lifetime of learning. Beginning with a reflection on the technological changes they have witnessed in the past 10 years, students in their freshman academy develop a learning plan for the next 10 years.

Director of Innovation for College and Career Readiness Daniel Phillips explained, “Their learning doesn’t stop with us, after they finish with us, or after a two- or four-year degree. The plan they build is a living document. As they go through different job shadows, guest speakers and industry certifications, they can document and



reflect on those experiences... It's a central component of their portfolio."

Real-world Problem Solving

Several of the leaders we spoke with sustain strong collaborations with community and industry partners to provide students with opportunities to tackle real-world problems. These partnerships also help educators stay current with the evolving skills, training and competencies that students need to succeed in the workplace. Elk Grove Unified School District and the Academy of Information Technology and Robotics are both Ford NGL communities, in which employers and community partners work with districts to develop and maintain strategic plans that embed workforce development and real-world experiences through authentic problem solving.

"We have formed partnerships with organizations such as Teledyne and the Volusia Manufacturers Association. Students complete internships on site that solve real-world problems with assistance from business professionals," continued Cunningham. "Our teacher team has the opportunity to participate in business externships that foster the connection of our students and business partners. Our administrative team supports our efforts by providing us with flexible scheduling, which allows us to bring real-world problems from our business partners to the classroom. They also allow us to bring in business professionals to work with our students during the school day."

Taking local connections to the next level, Central Florida Aerospace Academy's access to the aerospace industry is due in part to their location on an airport prop-

erty. In partnership with industry experts, students can hear directly what these industries need and are given opportunities to practice the latest technologies.

"People and businesses on the airport campus, all the way up to the director of the airport himself, embrace the students," shared Epperson. "The dynamic between the adults and the kids is fascinating... Students feel they are a part of it."

Grand Island Public Schools learns about trends in workforce preparation from their business partners. Daniel Phillips said, "We meet on a regular basis; we have [career] pathway level advisory committees as well as academy advisories." When partners notify them of updates, they have the ability to "change on the fly," with support from the teachers. "Everything we do is for the potential growth and improvement of the community; [teachers] embrace and cherish the responsibility, and they work their tails off to make sure they are doing everything they can do to ensure our students are prepared."

Looking Ahead, Staying Flexible

While all of these promising strategies can help schools start to prepare students for the human-technology frontier, the leaders that we interviewed remain realistic about their ability to predict the future. Hubbard noted that a crucial part of the role of the CTE educator is to prepare students for whatever they may face.

She said, "Students can learn skills and train for jobs, but if they haven't learned flexible and transferable competencies, they won't be able to navigate in the future. We don't know what we don't know. We — and they — have to stay flexible." ■

Joyce Malyn-Smith, Ed.D., is a distinguished scholar at Education Development Center and is a national expert on STEM career development and workforce education. She leads a body of work that explores how to enhance learning and support people in using their STEM skills, knowledge, and dispositions to pursue productive and rewarding careers. Email her at jmsmith@edc.org.

Jessica Juliuson is an EDC senior training and technical assistance associate. She cultivates strategic partnerships among schools, communities, and industry to enhance outcomes for youth. Drawing on her background in whole school change, Juliuson leads innovative initiatives focused on career and technical education, instructional design and teacher development. Email her at jjuliuson@edc.org.

Sarah MacGillivray is a project associate at EDC, where she specializes in providing technical assistance and communications support to a variety of projects that focus on equity, workforce development and broadening participation in STEM. Email her at smacgillivray@edc.org.

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ACTE — Serving Members and CTE Every Day



As we reflect on 2019, we have so many accomplishments to celebrate. I am most proud that all of our accomplishments are a result of a robust strategic plan driven by a very engaged board of directors and carried out every day by our outstanding staff! At ACTE, we are increasing membership value; providing new professional and leadership development opportunities; engaging members, states and regions in focused advocacy and awareness activities; expanding strategic partnerships; and equipping educators to meet emerging industry trends through innovative curricula.

ACTE continues to increase membership as well as attendance at events, and to launch new programs to serve our membership. Our organization has increased support to states through specific state conference programming, state website design, and state and national advocacy efforts. Staff has played a major role in communicating and supporting Perkins V implementation and state plan development.

We were delighted to kick off the inaugural year of the Postsecondary Leadership Success Program at ACTE – Sponsored by ECMC Foundation, expanding the Association’s ability to serve postsecondary educators. PLSP-ECMC Foundation operates in addition to established fellowship opportunities for new and experienced educators. We initiated the ACTE Hall of Fame to recognize all Lifetime Achievement Award finalists and rebranded the awards banquet as the ACTE Excellence Awards Gala! The Awards Gala reflects the excitement and celebration of saluting our outstanding career and technical education (CTE) professionals nationwide.

Technology was at the forefront on many levels. Our *Techniques* magazine archive was digitized. ACTE established a new partnership with NASA HUNCH to host the student video contest and we launched CTE Learn, an online professional development experience. In addition, ACTE served as a network lead for the CTE Research Network, in partnership with the American Institute for Research, JFF and Vanderbilt University.

And this, one final note that shall not go unnoticed: The ACTE board of directors is deeply appreciative of the Diversity Task Force’s hard work, time and energy in developing recommendations for the board to consider. Building upon the work of the Diversity Task Force, the ACTE board of directors developed the board statement, noted below, to address diversity and inclusion in 2019 and beyond.

ACTE promotes high-quality CTE programs for diverse audiences. We continue to build an inclusive culture that encourages, supports and celebrates the diversity of the CTE community. We are committed to equity, access, inclusion and diversity throughout our organization.

It is truly a year to celebrate! I am excited to see the continued growth and advancements of our organization. The future is bright and filled with potential. On behalf of the board of directors, I thank you for allowing us to serve your professional needs, to help you and your education colleagues serve our students’ and industry needs for the future.

A handwritten signature in black ink, reading "Nancy J. Trivette".

Nancy J. Trivette
ACTE President
2019–2020

PUBLIC POLICY, ADVOCACY AND RESEARCH

Federal Policy Activity

The year 2019 proved to be a busy one for CTE policy both in and outside Washington, D.C., with states submitting their one-year transition plans following the passage of the Strengthening Career and Technical Education for the 21st Century Act (Perkins V). With a new law on the books, ACTE has shifted gears from the reauthorization process toward helping states and local leaders with implementation. We have worked closely with the U.S. Department of Education's Office of Career, Technical and Adult Education on these implementation efforts, providing comments on proposals and holding regular meetings with staff there.

In addition, through partnerships with Advance CTE and other national organizations, we continue to support states in their work to develop bold, innovative four-year plans, which are due in April 2020. In the fall of 2019, we once again helped to host a series of national implementation meetings around the country, where state teams worked together to address common issues. We also have provided direct technical assistance to a number of states, and assisted with national working groups around the comprehensive local needs assessment and middle grades CTE, two of the key focus areas in Perkins V. Finally, we are helping to lead an expert review process of draft state plans as a service to states. More information about Perkins V and a variety of resources can be found on our dedicated Perkins V implementation webpage.

Without funding, however, none of the innovations in Perkins V state plans can be realized! The Fiscal Year (FY) 2020 appropriations process was delayed due to a partial government shutdown that lasted 35 days in December 2018 and January 2019 — the longest in our country's history. However, the Labor, Health and Human Services (HHS), Education, and Related Agencies bill, which funds the Perkins Basic State Grant program and other education and workforce development programs, was not affected by the shutdown because it was signed into law on Sept. 28, 2018.

Once the government shutdown ended, Congress moved quickly to create the FY 2020 appropriations bills. ACTE staff focused efforts on securing an increase in Perkins funding by meeting with appropriations committee members' offices to discuss the importance of allocating additional resources to Perkins. Additionally, as in previous years, we worked with policymakers to circulate a funding letter in support of increased investments in CTE. In total, 41 senators signed on to a letter calling for an increase in Perkins funding, as did a bipartisan coalition of 162 House members, the most ever for a first session of Congress.

In April, the House appropriations subcommittee approved its Labor, HHS and Education appropriations bill for FY 2020, and included a \$37 million increase for Perkins Basic State Grants. Following additional advocacy by ACTE and our partners at Advance CTE, an amendment

was approved in the full House Committee on Appropriations to add an additional \$10 million for Basic State Grants, bringing the total funding increase to \$47 million in the House. This increase came despite the Trump Administration's proposed level funding request for state grants. If these proposed levels are enacted into law, it would mark the third consecutive year of funding increases for Perkins.

In the Senate, a new budget deal established spending limits and the appropriations committee set the total top-line funding level for the Labor, HHS and Education bill, essentially flat-funding it with a 0.1% increase, bringing the total to \$178.299 billion. In mid-September, the Labor, HHS and Education subcommittee chairman proposed providing \$71.4 billion for the Department of Education, which is \$100 million less than the FY 19 enacted levels, and flat-funded Perkins at \$1.263 billion.

Since Congress was unable to pass any of the 12 appropriations bills before the end of the fiscal year on Sept. 30, it instead passed a continuing resolution — a temporary extension of government funding — until Nov. 21, 2019. Once each chamber passes its funding bills, a conference committee will work out the differences between the two versions of each bill. The bills will then go back to each chamber to be voted upon and, if passed, will go to President Trump for his signature. (Note: This publication is as of Oct. 22.)

Outside of appropriations, the major CTE-related legislation that has been the focus of the 116th Congress is the overdue reauthorization of the Higher Education Act. While advocates remained hopeful that some bipartisan progress would be made, as of October 2019, efforts are at a standstill. ACTE's top priorities include expanding Pell Grant eligibility to short-term job training programs, increasing students' access to meaningful data and reducing institutions' duplicative data burdens, and addressing the CTE teacher shortage. Throughout the year, we worked in partnership with a number of other organizations to promote bills related to these priorities, including through meetings with policymakers, letters, briefings on Capitol Hill and grassroots advocacy.

Action on other education- and workforce-related legislation is on hold. The Individuals with Disabilities Education Act and Temporary Assistance for Needy Families have not seen much movement in the 116th Congress. Additionally, while there has been some early talk of reauthorizing the Workforce Innovation and Opportunity Act, this work has not actually begun. However, we continue to develop and promote our priorities on these issues and others, and we provide regular feedback to Members of Congress on other CTE-related legislation.

ACTE also continued to work closely with the House and Senate CTE Caucuses this year. In 2019, ACTE helped organize and/or testify at several Senate and House CTE Caucus briefings, covering the basics of CTE, apprenticeships, middle school CTE, data, short-term Pell, agriculture education and more.

ACTE also partnered with the Senate CTE Caucus to host a reception in conjunction with the National Policy Seminar. The reception, attended by ACTE members, Members of Congress and congressional staff, showcased nine different career and technical student organizations (CTSOs) with students participating from all across the country.

Publications and Research

The CTE Policy Watch blog remained an important resource for advocates on the latest federal policy news. This year, the blog is on track to publish more than 125 stories related to federal and state policy, regulatory activity, research and more.

We have also continued to track CTE policy efforts at the state level in an effort to identify trends and share best practices among CTE stakeholders. In January 2019, ACTE and Advance CTE released our sixth annual state policy paper, "State Policies Impacting CTE: 2018 Year in Review," and participated in a corresponding webinar. Further, we continue in collaboration with myOptions to survey CTE students and educators nationwide about post-high school plans, perceptions of CTE and CTE program elements.

ACTE remains a provider of data- and research-based resources and publications to support advocacy and information efforts, updating our line of Sector Sheets and developing a new advocacy handout for business partners.

ACTE completed its first year as a lead for the CTE Research Network, in partnership with the American Institutes for Research, JFF and Vanderbilt University. The network aims to increase the number of CTE impact studies and strengthen the capacity of the field to conduct and use rigorous CTE research.

We act as a leader in the area of education and workforce data through partnerships with the Workforce Data Quality Campaign, the WorkCred Research Advisory Council and the PostSec Data Collaborative.

In 2019, ACTE promoted our high-quality CTE initiative, a multi-step project to identify a comprehensive, research-based *Quality CTE Program of Study Framework*, test the framework, and integrate it into our efforts to recognize and disseminate information on best practices within CTE. Following the release of the self-evaluation tool in 2018, work this year focused on refinements to that tool, new one-page fact sheets on each element, and tools and resources to help members understand how to use the Framework.

More resources linked to the individual elements were also created to assist with program improvement activities. A column on high-quality CTE was launched in the November/December 2018 issue of *Techniques*, and has continued to run throughout this year; two element-specific in-depth publications were released — on Business and Community Partnerships and Student Career Development — and a series of micro webinars on each element has been developed.

PROGRAMS & COMMUNICATIONS

Techniques



Techniques continues to offer significant value to ACTE members, offering the insight and best practices necessary for success in developing high-quality CTE programs of study. Known as ACTE's flagship publication, the monthly magazine covers new technology, classroom management trends, leadership and more. *Techniques* is professional development in print.

And online! New in fall 2019, ACTE members can read every issue ever printed. From its inception in September 1996, *Techniques* has served an express mission: to build 21st century schools (March 2003) for today's students (May & October 2012). Discover these issues and more in the archives.

PAGES, a *Techniques* blog, has experienced growth and success in 2019 — publishing articles that complement our print offerings, and installing regular columns such as Teaching Strategy and Member Connected News.

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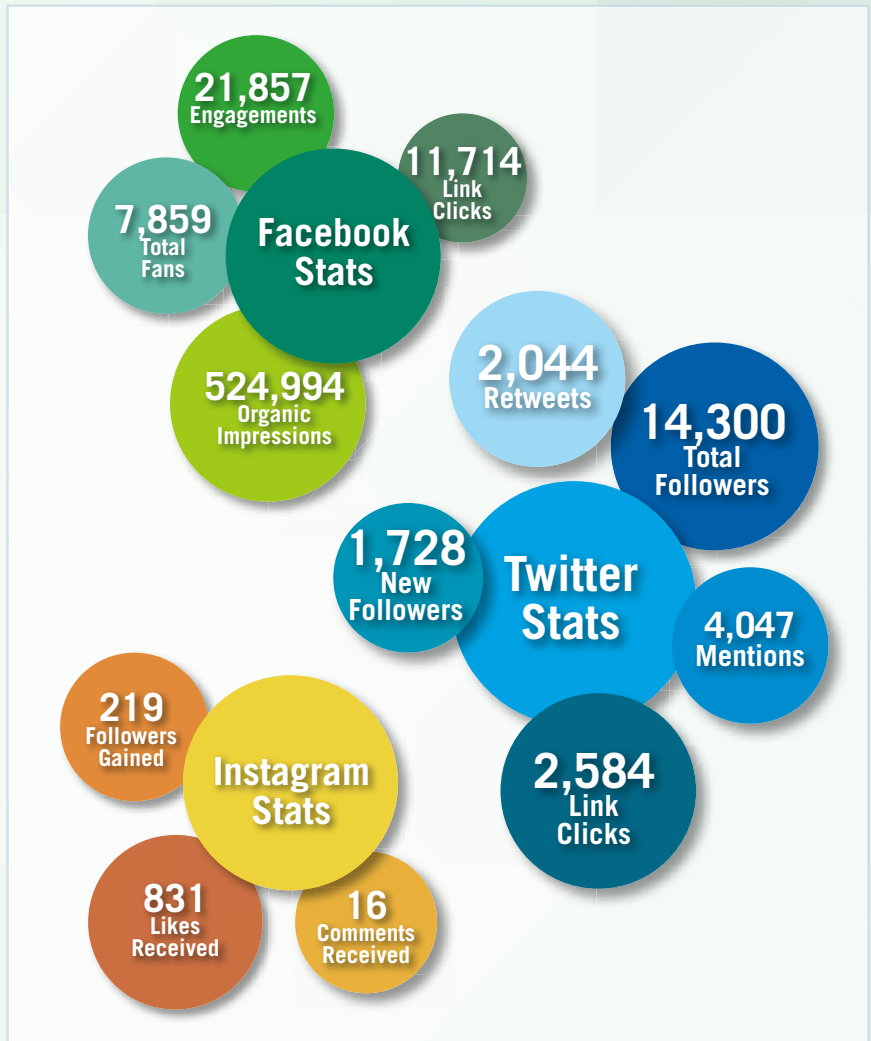
Social Media

ACTE continues to grow on social media through engagement and new followers.

February 2019 brought CTE Month®, during which ACTE hosted the #28DaysOfCTE featuring programs, resources and events. In addition, a live Twitter chat event focused on CTSOs was a success! Participants were highly engaged and responded with enthusiasm and new ideas.

In summer 2019, we launched two campaigns — to raise membership awareness and to advertise for ACTE's CareerTech VISION event. Both campaigns performed well, as has promotion of ACTE's resources, particularly the infographics. Infographics have received more than 900 likes, retweets, comments and shares across all platforms. We will continue to share resources and stats to increase CTE awareness.

For CareerTech VISION, ACTE promoted Download Day, encouraging attendees to download and interact with the event application. In the lead up to, and while on site at, VISION, we deployed new methods for increasing social media engagement; these included promotions and interactions through Instagram and Facebook stories. And, for the first time ever, the ACTE Excellence Awards Gala was livestreamed via Facebook. On social media, ACTE looks forward to engaging more with members and nonmembers, and promoting CTE.



	@actecareertech
	@actecareertech @TechniquesACTE @CTEMedia
	@actecareertech1

MEMBERSHIP

THANKS TO STRONG PARTNERSHIPS WITH THE STATE ASSOCIATIONS AND REGIONS, ACTE'S EFFORTS TO REACH AND PROVIDE VALUE to the national CTE community of educators and supporting organizations are yielding successful results. This fiscal year, ACTE added four organizations to the growing number of unified states and division affiliates, including Indiana ACTE, Maryland Career and Technical Administrators, Oregon ACTE and TIVA.

ACTE ended the fiscal year with 23,740 members and is delighted to report a rise in new members, from 4,595 in FY 2018 to 5,046 in FY 2019, due in large part to the above-mentioned unifications. Additional member highlights follow:

- Developed several joint membership marketing materials, campaigns and event pieces with states such as California, Indiana, Illinois, Kentucky, Missouri, Nebraska, North Dakota, North Carolina and Texas
- Created a new member digital packet and an ACTE member graphic for use on social media, email signatures and websites
- Hosted several member-specific social media campaigns such as Membership Mondays, Working Wonder Wednesdays and ACTE division-specific promotions
- Designed new pilot bulk memberships for Great Oaks Career Campuses and New Jersey CTE professionals
- Developed and hosted a new four-hour workshop on member recruitment, social media engagement, web content and cultivating leaders for representatives with nine New York CTE associations
- Added to the website the ability to collect contact information from individuals downloading ACTE's research infographics and publications to increase our member and event prospects

The 2019 ACTE member survey results emphasized opportunities to network with other CTE professionals as the most valued member benefit, followed by:

- Attending state and national ACTE conferences, highlighting the continued need for high-quality professional development in CTE and the positive collaboration between state and national ACTE
- Reading *Techniques*, our flagship publication covering a variety of CTE perspectives and issues
- Reviewing the legislative updates as they relate to CTE

ACTE will continue to support and sustain thriving relationships with the state associations, division affiliates, and individual and organizational members to advance our collective goals for CTE, and to ensure member benefits are aligned with member needs and values.



ACTE's CareerTech VISION 2019

ACTE's CareerTech VISION 2019 brought together the largest annual gathering of career and technical educators, industry representatives and business leaders in sunny Anaheim, California. With engaging keynote speakers, including former NASA astronaut Garrett Reisman and best-selling author Marcia L. Tate; more than 300 sessions covering high-quality secondary and postsecondary CTE; the CareerTech Expo; the ACTE Excellence Awards Gala and more, VISION continues to be the must-attend event for CTE professionals. Join us Dec. 2-5 in Nashville, Tennessee, for VISION 2020.

Overall Membership Growth in 2019





National Policy Seminar 2019

Building on the momentum of significant policy achievements, ACTE's National Policy Seminar 2019, March 25–27 in Arlington, Virginia, attracted educators from across the country to advocate for CTE on Capitol Hill. This event provided attendees with policy and advocacy how-to sessions to help strengthen support for CTE, a Perkins V symposium, and free preconference sessions offering an introductory overview of the Higher Education Act and Perkins. The Swiss Embassy apprenticeship event once again sold out in record time and provided attendees with added professional development and networking opportunities. Join us again, March 29–April 1, 2020, in Arlington, Virginia, to advocate for CTE and meet with policymakers on Capitol Hill.



Best Practices 2019

Attendance at the ACTE and NCLA Best Practices and Innovations in CTE Conference continues to grow; more than 400 CTE leaders gathered, Sept. 25–27, in Tucson, Arizona. This year's boutique event for CTE administrators included keynote speakers Kevin Fleming, Ph.D.; Lincoln Electric's Jason Scales, Ph.D.; and Cynthia Marble from SIGMA Management Threat Associates, along with specialized workshops, tours and sessions on a variety of CTE administrator issues. Join us Oct. 7–9, in Cape Cod, North Falmouth, Massachusetts, for Best Practices 2020.

Boots on the Ground

ACTE is proud to support the tremendous work of its affiliated state organizations through participation in state CTE events — providing legislative updates, details on important ACTE initiatives, membership information and more! In 2019, ACTE attended

more than 45 CTE events in the following states (with some states hosting multiple events): Alabama, Alaska, Arizona, Arkansas, California, Colorado, District of Columbia, Florida, Georgia, Hawaii, Idaho, Illinois, Indiana, Iowa, Kansas, Kentucky, Louisiana, Maine, Maryland, Massachusetts, Michigan, Minnesota, Mississippi, Missouri, Montana, New Mexico, Nebraska, New Jersey, New York, Nevada,

North Carolina, North Dakota, Ohio, Oklahoma, South Carolina, South Dakota, Tennessee, Texas, Utah, Virginia, Washington and Wyoming.

ACTE also participated in all five region conferences: Region I (Pennsylvania), Region II (North Carolina), Region III (Illinois), Region IV (Oklahoma) and Region V (Montana).

Expanding Outreach

ACTE is proud to represent member interests at a variety of events. Included below is a sampling of where we've been in 2019.

2019 National Career Development Association Conference

2019 National FFA Convention & Expo

Advance CTE events

American Association of Community College meetings

American School Counselor Association meetings

California Community College Association for Occupational Education Conference

Consortium of Adult Basic Education Annual Conference

DECA's International Career Development Conference

Family, Career and Community Leaders of America 2019 National Leadership Conference

JROTC meetings

NCCER Workforce Development Committee meetings

National Coordinating Council of Career Technical Student Organization Executive Directors, and Office of Career, Technical and Adult Education meetings

SkillsUSA National Leadership and Skills Conference

Trust for Insuring Educators Annual Meeting

PARTNERS

PARTNERSHIP CONTINUES TO BE AN IMPORTANT ASPECT OF ACTE'S WORK, OFFERING RESOURCES TO PRODUCE REPORTS and launch initiatives that the Association would otherwise be unable to introduce — broadening our reach to new audiences and developing a deeper understanding of topics important to members and the CTE field writ large. In 2019, ACTE increased the number of partners by more than 20, growing our portfolio to nearly 100!

This year, ACTE made special efforts to build partnerships with business and industry. Not only are employers a critical link for CTE program quality, but also CTE is central to helping solve the dilemma of skills shortages facing so many sectors today. We expect to continue to build on this work over the next few years.

Following are a few of the partnerships ACTE forged in 2019:



Accenture—Understanding that business and industry seek graduates who are work ready, ACTE was pleased to initiate a new partnership with Accenture to support their Skills to Succeed Academy. The Academy offers a free, highly interactive online training program to support young people — especially underserved populations — as they develop the skills and confidence to make career choices, and the employability skills to find and sustain employment. The ongoing partnership provides recognition funding to institutions that have at least 500 students complete one Academy course.



State Leaders Connecting Learning to Work

Advance CTE—ACTE continued to build upon our strong partnership with colleagues at Advance CTE, the national organization representing state government leaders in secondary, postsecondary and adult CTE. Advance CTE invited ACTE to provide content and policy expertise on a set of activities to support states as they develop Perkins V implementation strategies. In 2019, we hosted workshops advancing school counselors' understanding of career development, guidance and support. ACTE invited Advance CTE to contribute to the CareerTech VISION educational program, for which they planned a number of concurrent sessions on career clusters. Our partnership with Advance CTE evolved in many other ways during the year and we look forward to future expansion.



Ford Next Generation Learning—ACTE is partnering with Ford Next Generation Learning (NGL) to facilitate this year's Workforce Development Through CTE Summit, a convening of national trade associations all working with ACTE to address skills gaps and improve educator–employer connections in order to support students and develop a competitive workforce. Ford NGL contributed to the development of the Summit's inaugural launch in 2018 and will participate as an active partner moving forward.



Career and Technical Education Research Network—ACTE joined lead partner, the American Institutes for Research, as well as JFF and Vanderbilt University, to initiate the first of a five-year initiative funded by the Institute of Education Sciences. The CTE Research Network is expanding the evidence base by promoting CTE impact studies and strengthening the field's capacity to conduct and use CTE research. The work is carried out through research, training, coordination and dissemination.



ECMC Foundation—An educated and prepared cadre of leaders is critical to program quality, especially as our profession grapples with its own skills gap. The ECMC Foundation stepped up in 2019 to provide support for the Postsecondary Leadership Success Program at ACTE. The program brings 20 postsecondary leaders together for a yearlong professional development program. PLSP-ECMC Foundation Fellows travel to four in-person events, attend monthly webinars, author and present on CTE leadership topics, and address an operational challenge at their institutions.



Bill and Melinda Gates Foundation—ACTE secured support to hire a consultant to advance the Coalition for Workforce Development Through CTE initiative. Aligned with ACTE's Workforce Development Through CTE Summit, this work will focus on advancing messaging and educator–employer connections through a series of supported activities. The goal of the Coalition

and complementary summit is to bridge the gaps between our two communities in order to support students and a competitive workforce.



NOCTI—One of our most prolific partners, NOCTI has contributed to numerous projects over the course of the year. NOCTI partnered with ACTE to host the second Credential Summit, a national event exploring best practices, research and applications with experts from across the nation. NOCTI also partnered with ACTE to produce *CTE Administrative Leadership: 10 Things to Know*, the second book in a series that supports administrators as they endeavor to lead their institutions, successfully and practically.



Harbor Freight Tools for Schools—A philanthropic initiative of The Smidt Foundation, Harbor Freight Tools for Schools is dedicated to the advancement of skilled trades education in the United States. They invited ACTE to help coordinate the first round of judging for its 2019 Prize for Teaching Excellence, which has awarded over \$1 million to 18 outstanding public high school skilled trades teachers, teacher teams and their programs.



MaxKnowledge—Expanding the scope of high-quality online professional development available to our members is made possible through partnership with this nationally known online content provider. A broad portfolio of courses on pedagogy — and a selection of new free learning modules developed with the Asia Society and the Project Management Institute Educational Foundation (PMIEF) — is available at CTE Learn.



Xello—In 2019, Xello supported a series of activities, including development of a publication and micro-webinar, all focused on Student Career Development, one of the 12 elements included in ACTE's *Quality CTE Program of Study Framework*. Xello also stepped up as a sponsor of ACTE's CareerTech VISION, supplying important support to the event.

MEDIA ACTIVITIES

WITH AN AIM TO INCREASE AWARENESS ABOUT THE BENEFITS OF HIGH-QUALITY CTE PROGRAMS AND EXAMPLES OF OUTSTANDING programs all across the country, ACTE has continued its media outreach through a variety of mediums. From television to radio, and newspapers to online platforms, we implemented an aggressive strategy. ACTE was specifically quoted in dozens of news stories, including in distinguished national outlets like *The Washington Post*, *Politico*, *The New York Times* and others.

ACTE's media visibility extended to op-eds as well. ACTE Executive Director LeAnn Wilson co-authored a piece in the *San Francisco Chronicle* on credentials, and a San Antonio publication on the variety of postsecondary options. Additionally, ACTE Deputy Executive Director Stephen DeWitt was featured on a C-SPAN program, discussing workforce training.

In addition to the direct coverage ACTE receives in the media, reporters rely on the Association for background information and analysis. ACTE staff spoke with dozens of reporters for background to

help them write positive and accurate stories on CTE and ACTE's policy priorities. Indeed, ACTE's fingerprints can be found on dozens of stories that did not feature our name, but nonetheless contributed to the narrative. ACTE also raised awareness about critical federal CTE policy issues by distributing press releases on issues like appropriations, legislation and more.



CTE Month

In February 2019, CTE Month provided a terrific opportunity to promote program success stories and news articles via social media and a lively Twitter chat with CTSOs. Governmental proclamations honoring the benefits of high-quality CTE raised additional awareness about CTE. ACTE also hosted its first ever CTE Month–NASA HUNCH video challenge with the theme “Working Out of this World,” featuring CTE and project-based learning programs in

high-demand career fields on Earth and in space. HUNCH stands for High School Students United with NASA to Create Hardware and hopes to extend its message of inspiring students through project-based learning to CTE students across the nation. The three winning schools, highlighted below, received a stunning NASA HUNCH plaque with a flown International Space Station patch and a check for \$500, \$250 and \$125 for first, second and third place, respectively.

First place: Mackay High School in Idaho

Second place: Greater New Bedford Voc-Tech in Massachusetts

Third place: Lone Peak High School in Utah

ACTE staff also participated in a CTE Month site visit at the Academies of Loudoun in Virginia. Secretary of Education Betsy DeVos joined ACTE to tour the impressive facilities and participate in a roundtable to discuss ways the federal government can support CTE.

LEADERSHIP

IN 2019, ACTE CONTINUED ITS ACTIVITIES AND INITIATIVES TO FURTHER ENGAGE MEMBERS WITH THE ASSOCIATION and develop their leadership potential. These activities support ACTE's strategic goals to engage its membership and grow a strong leadership pipeline.

Educators in Action

Educators in Action is a small army of ACTE members who volunteer their time and expertise to advocate for ACTE and CTE in their communities; write for ACTE's publications; provide input on ACTE's professional development offerings; and serve on committees, task forces and advisory groups to work toward ACTE's strategic goals. This year, Educators in Action continued to host Virtual CTE Discussions for their peers on a variety of topics and provided

input on ACTE's new strategic plan. The Educators in Action volunteer opportunities have been featured on ACTE's social media platforms for the first time ever, increasing the volunteers' network and activity.



Educators in Action Blog

The Educators in Action blog has had a successful year building a loyal following of writers and readers. The interactive blog platform, which gives members a forum to share their best practices, opinions and stories, continued to partner with *Techniques*.

New Leadership Programs

ACTE put together a task force to help grow its leadership talent pipeline in underrepresented areas at the state, region, division and national levels. As a result of this group's recommendations, the board of directors approved the creation of three leadership programs: ACTE LEAD, an intensive and focused leadership development program for new professionals; ACTE Connect, which will give attendees at region conferences a glimpse into getting involved with ACTE; and a New Professionals Cohort of the National Leadership Fellowship Program, which began last year, as an extension of the current fellowship program. You can learn more about these programs on ACTE's website.

RESOURCES

Quality CTE Program of Study Framework:
<https://www.acteonline.org/wp-content/uploads/2019/01/HighQualityCTEFramework2018.pdf>

High-quality CTE Tools:
acteonline.org/professional-development/high-quality-cte-tools/

Perkins V Implementation:
acteonline.org/perkins-implementation/

CTE Policy Watch Blog:
ctepolicywatch.acteonline.org/

PAGES, a Techniques Blog:
acteonline.org/publications/techniques/pages-blog/

Educators in Action Blog:
acteonline.org/publications/blogs/educators-in-action-blog/

ACTE Student Trophy Design Contest:
acteonline.org/trophy_design_contest

Excellence Awards:
acteonline.org/awards

ACTE's CareerTech VISION:
careertechvision.com/

Accenture Skills to Succeed Academy:
acteonline.org/s2s/

Career & Technical Education Research Network:
cteresearchnetwork.org/

Postsecondary Leadership Success Program at ACTE – Sponsored by ECMC Foundation:
acteonline.org/plsp-ecmcf/

Workforce Development Through CTE Summit:
acteonline.org/wfd-cte/

CTE Learn:
ctelearn.org

Techniques Archive:
acteonline.org/publications/techniques/techniques-archives/

Leadership Development:
acteonline.org/professional-development/leadership-development/

AWARDS

ACTE'S RECOGNITION PROGRAMS HAVE CONTINUED TO GROW IN APPLICANTS AND ELEVATE THE PERCEPTION OF CTE. THE EXCELLENCE AWARDS REWARD PROFESSIONALS IN THE FIELD for spearheading innovations and fostering best practices in high-quality CTE programs.

2019 Award Winners

In November 2018, ACTE recognized the following career and technical educators, professionals and business leaders at the Awards Banquet presentation in San Antonio, Texas. Award winners were invited to present sessions on their best practices at CareerTech VISION 2019.



Teacher of the Year, sponsored by Express Employment Professionals: Liz Dinkins, Francis Tuttle Technology Center, Oklahoma City, Oklahoma



Career Guidance Award, sponsored by U.S. Army: Shelley Thome, West-MEC, Glendale, Arizona



Administrator of the Year, sponsored by Goodheart-Willcox: Meg Giancesello, Chandler Unified School District, Chandler, Arizona



Postsecondary Teacher of the Year, sponsored by Goodheart-Willcox: Kim Holdbrooks Townsel, Jacksonville State University, Jacksonville, Alabama



New Teacher of the Year, sponsored by Goodheart-Willcox: Katie Hatt, Grand Forks Public Schools/Grand Forks Area Career & Technology Center, Grand Forks, North Dakota



Carl Perkins Community Service Award: Bart Taylor, College Station ISD, College Station, Texas



Lifetime Achievement Award: Jeanne Roberts, Arizona Department of Education (Retired), Chandler, Arizona



Teacher Educator of the Year Award: Peder Gjovik, Valley City State University, Valley City, North Dakota



Business-Education Partnership Award: NEW Manufacturing Alliance, Oshkosh, Wisconsin



Champion for CTE Award: Marc Schulman, President, Eli's Cheesecake Company, Chicago, Illinois

Excellence & Elegance

This year, ACTE has worked to increase the prestige of the traditional Awards Banquet by shifting the event from a banquet to a gala. The Awards Gala modifications will help make the event a truly exceptional one, to ensure we honor the best in CTE. Some of these changes include an extended band throughout dinner, an increase in presentations on screen for each award program, cocktail attire, and an increase in music during the awards program. We hope to continue to increase the exuberance and entertainment over the next few years!

2019 Student Trophy Design Contest

Since 2013, ACTE has partnered with Stratasys to present the national award winners with unique trophies that celebrate and embody ACTE's core values. Created by cutting-edge 3D-printing technology, the trophies reflect CTE's role in preparing students for 21st-century careers, and they harness the power of collaboration between CTE and business and industry partners. In 2019, ACTE held its fourth annual student competition to redesign the trophies; the contest received 428 entries representing a continued interest in this program, which started in 2016 with 75 entries total.

The winning design was submitted by Kathleen Terwilliger, a recent graduate of Seacoast School of Technology in Exeter, New Hampshire, and was used as the template for the national trophies presented at the Awards Gala in Anaheim, California. For her winning entry, Terwilliger received a \$1,000 scholarship, and Seacoast School of Technology received a one-year lease of a 3D printer, courtesy of Stratasys. Kathleen Terwilliger was recognized at the gala alongside her teacher, Samantha Tukey. Learn more about the winning design and next year's contest at www.acteonline.org/trophy_design_contest.

2020 Awards

In March 2019, 36 state associations moved 149 state member award winners forward for consideration at the region level for the 2019–2020 awards program.

The national winners were announced and honored at the Awards Gala in Anaheim during VISION 2019. For their generous support of the awards program and the event, ACTE would like to thank our sponsors: Express Employment Professionals, Goodheart-Willcox, CareerSafe, and Stratasys Ltd. Members can view the winner announcements at www.acteonline.org/awards.

For their generous support of the awards program and the event, ACTE would like to thank our sponsors: Express Employment Professionals, Goodheart-Willcox, CareerSafe and Stratasys.

Announcing the ACTE Hall of Fame

Though we can give only one Lifetime Achievement Award, we felt strongly they all deserved to be recognized. And so, for the first time ever at the Awards Gala, ACTE inducted all five Lifetime Achievement national finalists into the new ACTE Hall of Fame. The Hall of Fame honors the leadership of CTE professionals who have made enduring contributions to CTE throughout their career.

149 STATE MEMBER AWARD WINNERS MOVED FORWARD

37 REGION WINNERS MOVED FORWARD TO THE NATIONAL LEVEL

2 NATIONAL RECIPIENTS OF THE ACTE IMPACT AWARDS

428 STUDENT TROPHY DESIGN CONTEST APPLICATIONS





www.deleonandstang.com

INDEPENDENT AUDITORS' REPORT

**Board of Directors
Association for Career and Technical Education
Alexandria, Virginia**

We have audited the accompanying financial statements of the Association for Career and Technical Education (a nonprofit organization), which comprise the statements of financial position as of June 30, 2019 and 2018, and the related statements of activities, functional expenses, and cash flows for the years then ended, and the related notes to the financial statements.

Management's Responsibility for the Financial Statements

Management is responsible for the preparation and fair presentation of these financial statements in accordance with accounting principles generally accepted in the United States of America; this includes the design, implementation, and maintenance of internal control relevant to the preparation and fair presentation of financial statements that are free from material misstatement, whether due to fraud or error.

Auditors' Responsibility

Our responsibility is to express an opinion on these financial statements based on our audits. We conducted our audits in accordance with auditing standards generally accepted in the United States of America. Those standards require that we plan and perform the audit to obtain reasonable assurance about whether the financial statements are free from material misstatement.

An audit involves performing procedures to obtain audit evidence about the amounts and disclosures in the financial statements. The procedures selected depend on the auditors' judgment, including the assessment of the risks of material misstatement of the financial statements, whether due to fraud or error. In making those risk assessments, the auditors consider internal control relevant to the entity's preparation and fair presentation of the financial statements in order to design audit procedures that are appropriate in the circumstances, but not for the purpose of expressing an opinion on the effectiveness of the entity's internal control. Accordingly, we express no such opinion. An audit also includes evaluating the appropriateness of accounting policies used and the reasonableness of significant accounting estimates made by management, as well as evaluating the overall presentation of the financial statements.

We believe that the audit evidence we have obtained is sufficient and appropriate to provide a basis for our audit opinion.

This published version of the auditor's report constitutes only a summary of the complete report.
Full reports are available upon request.

**Association for Career and Technical Education
Independent Auditors' Report
Page 2**

Opinion

In our opinion, the financial statements referred to above present fairly, in all material respects, the financial position of the Association for Career and Technical Education as of June 30, 2019 and 2018, and the changes in its net assets and its cash flows for the years then ended in accordance with accounting principles generally accepted in the United States of America.

Report on Supplementary Information

Our audits were conducted for the purpose of forming an opinion on the financial statements as a whole. The schedules of net assets without donor restrictions, board designated - regions and divisions and the schedules of net assets with donor restrictions, shown on pages 21-24, are presented for purposes of additional analysis and are not a required part of the financial statements. Such information is the responsibility of management and was derived from and relates directly to the underlying accounting and other records used to prepare the financial statements. The information has been subjected to the auditing procedures applied in the audit of the financial statements and certain additional procedures, including comparing and reconciling such information directly to the underlying accounting and other records used to prepare the financial statements or to the financial statements themselves, and other additional procedures in accordance with auditing standards generally accepted in the United States of America. In our opinion, the information is fairly stated in all material respects in relation to the financial statements as a whole.

Emphasis of Matter

As discussed in Note 2 to the financial statements, as of June 30, 2019, the Association for Career and Technical Education adopted Accounting Standards Update (ASU) 2016-14, Presentation of Financial Statements for Not-for-Profit Entities. The update addresses the complexity and understandability of net asset classification, information about liquidity and availability of resources, methods used to allocate costs to programmatic and other support information, and direction for consistency about information provided on investment return. The adoption of the standard resulted in additional footnote disclosures and significant changes to the classification of net assets and the disclosures related to net assets. The ASU has been applied retrospectively to all periods presented with the exception of the omission of certain information as permitted by the ASU. Our opinion is not modified with respect to this matter.

DeLeon & Stang

**DeLeon & Stang, CPAs
Gaithersburg, Maryland
October 2, 2019**



This published version of the auditor's report constitutes only a summary of the complete report.
Full reports are available upon request.

ASSOCIATION FOR CAREER AND TECHNICAL EDUCATION
Statements of Financial Position
June 30, 2019 and 2018

	<u>2019</u>	<u>2018</u>
<u>ASSETS</u>		
<u>Assets:</u>		
Cash and cash equivalents	\$ 308,365	\$ 180,947
Restricted cash	7,195	5,745
Investments in marketable securities	6,472,145	5,657,705
Accounts receivable	107,642	117,227
Inventory	37,876	22,975
Prepaid expenses and other assets	275,503	233,733
Property and equipment, net of accumulated depreciation	1,583,390	1,725,429
TOTAL ASSETS	\$ 8,792,116	\$ 7,943,761
<u>LIABILITIES AND NET ASSETS</u>		
<u>Liabilities:</u>		
Accounts payable and other liabilities	\$ 307,427	\$ 290,304
Deferred revenue	1,605,762	1,542,396
Rental deposits	2,475	7,010
Note payable	266,345	331,214
Total liabilities	2,182,009	2,170,924
<u>Net Assets:</u>		
Without donor restrictions	2,726,778	1,782,595
Without donor restrictions, Board-Designated Regions and Divisions	441,696	453,487
Without donor restrictions, Board-Designated Capital Improvements/Reserves	3,224,380	3,224,380
Total net assets without donor restrictions	6,392,854	5,460,462
Net assets with donor restrictions	217,253	312,375
Total net assets	6,610,107	5,772,837
TOTAL LIABILITIES AND NET ASSETS	\$ 8,792,116	\$ 7,943,761

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ASSOCIATION FOR CAREER AND TECHNICAL EDUCATION
Statements of Activities
For the Years Ended June 30, 2019 and 2018

	2019			2018		
	Without Donor Restrictions	With Donor Restrictions	Total	Without Donor Restrictions	With Donor Restrictions	Total
Revenue and Support:						
Membership dues	\$ 1,723,855	\$ -	\$ 1,723,855	\$ 1,714,380	\$ -	\$ 1,714,380
Contributions	232,116	1,600	233,716	40,224	74,165	114,389
Sponsorship	401,324	-	401,324	266,596	-	266,596
Program service revenue:						
Convention, conferences and workshops	2,931,288	-	2,931,288	2,598,409	-	2,598,409
Publications	257,681	-	257,681	146,961	-	146,961
Education services	-	-	-	-	-	-
Advertising	157,064	-	157,064	164,853	-	164,853
Rental income	181,631	-	181,631	199,075	-	199,075
Service fees	27,008	-	27,008	21,295	-	21,295
Other revenue	286,404	-	286,404	180,945	-	180,945
Investment income	254,532	9,910	264,442	142,702	936	143,638
Net assets released from restrictions	106,632	(106,632)	-	19,406	(19,406)	-
Total revenue and support	6,559,535	(95,122)	6,464,413	5,494,846	55,695	5,550,541
Expenses:						
Program services	3,457,987	-	3,457,987	2,832,464	-	2,832,464
Supporting services	2,169,156	-	2,169,156	1,981,819	-	1,981,819
Total expenses	5,627,143	-	5,627,143	4,814,283	-	4,814,283
Change in net assets	932,392	(95,122)	837,270	680,563	55,695	736,258
Net assets at beginning of year	5,460,462	312,375	5,772,837	4,779,899	256,680	5,036,579
Net assets at end of year	\$ 6,392,854	\$ 217,253	\$ 6,610,107	\$ 5,460,462	\$ 312,375	\$ 5,772,837

This published version of the auditor's report constitutes only a summary of the complete report.
 Full reports are available upon request.

HARBOR FREIGHT

TOOLS FOR SCHOOLS

ACTE Celebrates the 2019 Prize for Teaching Excellence Winners!



\$100,000 FIRST PLACE WINNERS



Cesar Gutierrez
PRECISION MANUFACTURING
Desert View High School
Tucson, AZ



Wendy Schepman
LANDSCAPE OPERATIONS
South Fork High School
Stuart, FL



Brent Trankler
WELDING
Sikeston Career and Technology Center
Sikeston, MO

\$50,000 SECOND PLACE WINNERS

Robert Brightbill
CONSTRUCTION
Dauphin County Technical School
Harrisburg, PA

**Michael Campanile and
Michael Schweinsberg**
WELDING AND MASONRY
Carroll County Career and
Technology Center
Westminster, MD

Ken Cox
AUTOMOTIVE
Redwood High School
Visalia, CA

Eric Dyer
AGRICULTURE MECHANICS
Woodland High School
Woodland, CA

Stephen Glaser
MANUFACTURING
Harvard High School
Harvard, IL

Dennis Johnson
TRANSPORTATION TECHNOLOGY
Fallbrook High School
Fallbrook, CA

Henrietta Jutson
INTEGRATED SYSTEMS
TECHNOLOGY
Jack Britt High School
Fayetteville, NC

Jodi Lancaster
WELDING
Livingston Area Career Center
Pontiac, IL

Jacob Leair
WELDING
Grants Pass High School
Grants Pass, OR

David Lilly
AUTOMOTIVE
Portsmouth High School
Portsmouth, NH

Joel Massarello
AUTOMOTIVE
Oakland Schools Technical
Campus Northwest
Clarkston, MI

Troy Reichert
INDUSTRIAL TECHNOLOGY
Guernsey-Sunrise High School
Guernsey, WY

Derek Rowe
AVIATION MAINTENANCE
McGavock High School
Nashville, TN

Peter Wachtel
PRODUCT INNOVATION
AND ARCHITECTURE
Adolfo Camarillo High School
Camarillo, CA

Baxter Weed
AUTOMOTIVE
Cold Hollow Career Center
Enosburg Falls, VT

Congratulations Winners!

The 2019 Harbor Freight Tools for Schools Prize for Teaching Excellence honors 18 outstanding skilled trades teachers with \$1 million in cash awards.

Easier to Own. Easier to Learn.

If You're Looking for That, We've Got You Covered.



Promote Learning...By Making

Break ground, not the bank.

If you're starting a machining program, a fab lab, or a robotics team, amp up more quickly with fully-capable CNC machines at a friendly price.

At Tormach, we empower people who make things. And that starts with accessible price points, modular options, and value adds like free shipping to the continental USA.

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Reality happens. And one day, it will inevitably happen to you.

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If you hit a roadblock where you cannot solve something, our team of in-house machinists will help get you cutting again.

Learning Can Be More Intuitive

The brain behind all Tormach CNC machines is PathPilot, our award-winning CNC control. Using PathPilot is intuitive, it plays well with any CAD/CAM, and shines like the sun when used conversationally.

Plus, the PathPilot you learn with a Tormach mill is the same PathPilot you get on a lathe, which is great for cross-training in an educational setting.





Amplify Your Voice in Support of CTE

Advocate on behalf of the career and technical education (CTE) profession and increase our collective impact by participating in ACTE’s annual National Policy Seminar (NPS) this **March 29–April 1** in Arlington, Virginia. This year’s event features:

- Dedicated time on Capitol Hill to meet with legislators and advocate for your CTE programs
- Sessions on policy and advocacy strategies to help you strengthen support for CTE
- Updates on legislation and policies impacting CTE
- Guidance to aid in Perkins V implementation

Early bird registration is now open! Visit acteonline.org/nps.



Student Video Challenge – Working on the Moon

ACTE and NASA HUNCH are excited to host the student video challenge, “Living and Working on the Moon and Beyond.” Open to middle school, high school and postsecondary students, this year’s submissions can feature one or more of the following ideas:

- Celebrate the 50+ year anniversary of the Apollo 11 mission by “looking back and looking ahead” — discuss

some ideas of what lies ahead in lunar exploration and colonization.

- The moon is our closest planetary neighbor (average distance of 384,400 kilometers or 238,900 miles). Feature a project (hosted on Earth or the moon) that could advance our understanding of living and working in extreme environments.
- Showcase a future scenario on the moon that incorporates CTE and/or project-based learning.

The deadline to submit videos, two minutes or less in length, is **March 2**. To view video submission guidelines and resources, visit acteonline.org/video-challenge.



Submit Your VISION 2020 Presentation Proposals

You are invited to participate as a presenter at ACTE’s CareerTech VISION 2020, the premier event for career and technical educators, business leaders and industry professionals, **Dec. 2–5** at the Gaylord Opryland in Nashville, Tennessee. VISION presenters will have the opportunity to:

- Take advantage of more than 300 informative CTE sessions, influential keynote speakers and the CareerTech Expo
- Contribute to the CTE field by sharing best practices, program innovations and successful collaborations
- Advocate for CTE to key stakeholders from across the nation
- Receive a speaker discount on the VISION early bird registration rate

We are seeking presentation proposals that cover high-quality second-

ary and postsecondary CTE in all program areas, from administration, trade and industrial education, engineering and technology education to health science, family and consumer sciences, business and marketing education and much more! Sessions are typically 60 minutes in length and should allow time for questions. The deadline to submit proposals is **Feb. 29**. Visit careertechvision.com.



Thoughts and Reflections about the Postsecondary Leadership Success Program at ACTE – Sponsored by the ECMC Foundation

Interested in learning more about postsecondary leadership experiences at ACTE? Consider the thoughts and reflections shared by the first cohort of the Postsecondary Leadership Success Program at ACTE – Sponsored by ECMC (PLSP-ECMC) Foundation! Throughout their yearlong leadership development program, the PLSP-ECMC Foundation fellows captured their experiences through short essays; to read these short essays, please visit acteonline.org/plsp-ecmcf-publications/.

The Postsecondary Leadership Success Program at ACTE – Sponsored by ECMC Foundation is a yearlong professional development experience intended to develop the organizational leadership and management skills of postsecondary CTE professionals, with an emphasis on addressing the needs of underserved populations. Please visit acteonline.org/plsp-ecmcf for the continued development of this program and to see the accomplishments, updates and announcement of the second cohort.



CTE Learn State Network Expands

Colorado, Maryland, Montana, Nebraska and Nevada ACTE have announced the opening of their state association branded online learning portals through the CTE Learn network.

With a comprehensive catalog of more than 150 courses designed to elevate the teaching, leading and support role of CTE educators, these state portals also provide access to a rich set of free lessons and resources. Visit ctelearn.org and select State Portals to see the full list of professional development opportunities.

State Leadership Training

Are you looking to further develop your leadership skills in your role as a state association leader? Join us on March 29 from 8:00 a.m.–5:00 p.m. All current state leaders and those interested in service are welcome to attend. Registration cost is \$25; register on your NPS registration form. ■

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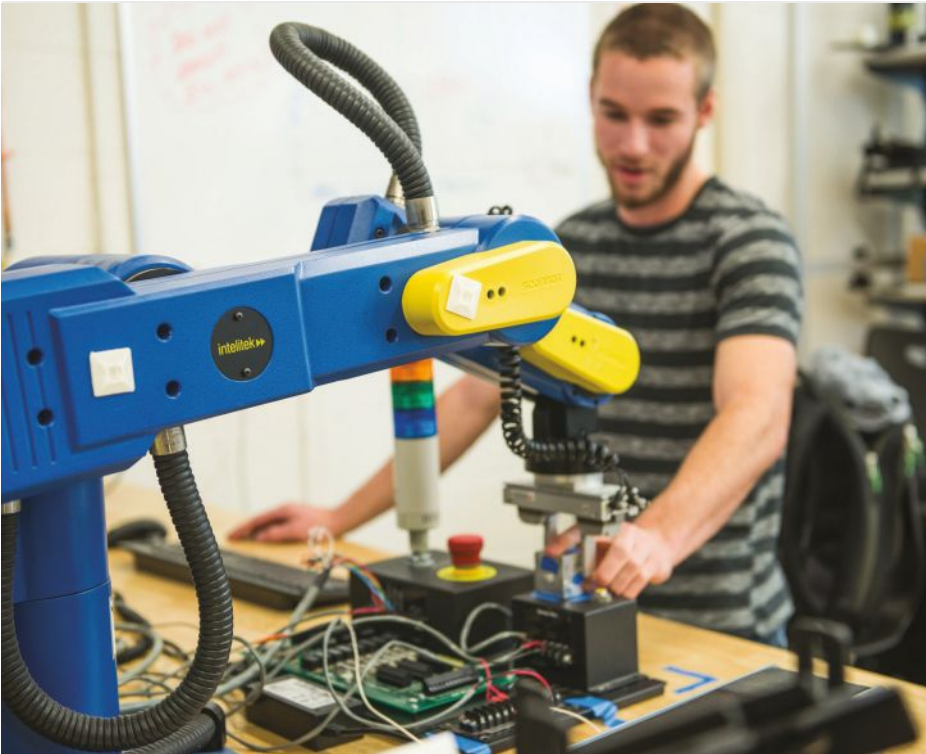
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Kuder.....	www.kuder.com	2-3
Marine Corps Scholarship Foundation.....	www.mcsf.org	63
TORMACH.....	www.tormach.com	53
University of Central Missouri.....	www.ucmo.edu/mocte	62

ROBOTICS TECHNICIAN

By Susan Reese



ROBOTICS TECHNICIANS BUILD, INSTALL, TEST AND MAINTAIN ROBOTIC EQUIPMENT AND RELATED

automated production systems. Their duties include making repairs to robots or peripheral equipment, such as circuit boards, sensors, controllers, encoders or servomotors. They may install, program or repair programmable controllers, robot controllers, and end-of-arm tools or conveyors. Other duties may include troubleshooting robotic systems, maintaining service records of robotic equipment or automated production systems, and modifying computer-controlled robot movements.

The Workplace

Robotics technicians are employed in the manufacturing of machinery, transportation equipment, semiconductors, electronic components and electro-medical and control instruments. They may also work in other professional, scientific and technical services organizations.

SCHOOL SPOTLIGHT

NHTI-CONCORD'S COMMUNITY COLLEGE

NHTI OPENED IN 1965 UNDER THE NAME NEW HAMPSHIRE TECHNICAL INSTITUTE, BUT IN 2008, the name was changed to NHTI-Concord's Community College. When the school opened, there were three engineering technology programs, but today NHTI is a comprehensive community college with more than 4,600 students, and it offers more than 90 academic programs, including 42 associate degree programs, 51 certificate programs and two professional certificate programs. NHTI offers seven associate degree programs and 12 certificate programs that are entirely online,

making education even more accessible to working adults and others across the state of New Hampshire.

NHTI also offers high school students a number of opportunities through its Collaborative High School Programs. These include Early College, in which high school students can take college courses on the Concord campus at a discounted tuition cost; eStart, a dual credit program in which high school students can earn high school and college credits simultaneously in online courses through the Community College System of New Hampshire; and Running Start, which enables high school

students to take challenging college courses at a reduced tuition rate. NHTI also has been authorized by Cisco to offer training for the Cisco Certified Network Associate Training Program as part of its information technology networking degree. The Running Start program for high school students also offers Cisco training.

NHTI is one of the seven colleges of the Community College System of New Hampshire. In addition to its accreditation by the New England Commission of Higher Education, NHTI has also received specialized accreditation for a number of its programs, including accreditation of its architectural, computer, electronic, manufacturing and mechanical engineering technologies by the ETAC Commission of ABET.

Today, NHTI offers a long list of options for students interested in an engineering career. Among these are architectural engineering, civil engineering, computer engineering, electronic engineering and mechanical engineering, as well as degrees and certificates in areas that range from ad-

Education

Robotics technicians typically require training in a career and technical education (CTE) program, most often an associate degree and on-the-job related experience. Some may earn a postsecondary certification, while others receive a bachelor's degree. A number of career and technical schools and community colleges offer certificate and associate degree programs in the field.

Earnings

According to the *Occupational Outlook Handbook* from the U.S. Department of Labor's Bureau of Labor Statistics (2019), the median annual wage for electro-mechanical technicians, such as robotics technicians, was \$57,790 in May 2018, with the highest 10% earning more than \$88,860. Recruiter.com (2019) also reports that the average wage for robotics technicians is between \$50,000

and \$60,000, depending on education and experience.

Job Outlook

The *Occupational Outlook Handbook* projects that employment for electro-mechanical technicians will grow about 4% from 2016–

2026, noting that their broad skill set will assist their employment options, especially in working with machines wired to computer control systems, assisting with automation of various processes, and operating and maintaining mechanical sensors that are increasingly used in manufacturing.

EXPLORE MORE

For more information about the career of robotics technician and the education and training it requires, here are some resources to explore.

ABET
abet.org

American Society for Engineering Education
asee.org

Automation Federation
automationfederation.org

ETA International
eta-i.org

FIRST Robotics Competition
firstinspires.org/robotics/frc

IEEE
ieee.org/

International Society of Automation
isa.org

National Institute for Certification in Engineering Technologies
nicet.org

Society of Manufacturing Engineers
sme.org

vanced manufacturing, animation and game programming, to robotics and automation.

NHTI's robotics and automation engineering technology associate degree program prepares students for employment in the field of advanced manufacturing. In the first semester of the two-year program, students take courses in Electric Circuits, Digital Fundamentals and Engineering Design, in addition to college algebra and communications courses. The second semester consists of Introduction to Programming with C++, Integrated Circuits and Interfacing, Manufacturing and Materials Processing, English Composition and Pre-Calculus.

In the fall semester of the second year of the program, students take Lean Manufacturing, PLC Programming, Robotics and Automation I, Calculus I, Physics and a social science elective. The last semester includes Circuit Analysis, Production Systems, Robotics and Automation II, Physics II, and a humanities/fine arts/foreign language elective.

Graduates of this program have been very successful, according to Joe Cunning-

ham, who is the department chair for mechanical, manufacturing, robotics and automation engineering technologies. He noted, "We have an automation certificate pending approval, which includes courses from the program packaged as a certificate for those who currently work in industry or students wishing just core courses. They are stackable to the associate of science degree."

Students at NHTI who wish to pursue four-year degrees have a number of resources available to assist in their transition. In addition, NHTI and the University of New Hampshire-Manchester (UNH-Manchester) have a dual admission agreement that enables students interested in pursuing specific degree pathways to be admitted jointly to both NHTI and UNH-Manchester, so that students who earn an associate degree at NHTI in one of these majors can automatically begin studying for their baccalaureate degree at UNH-Manchester without filling out an application. The robotics and automation engineering technology program has artic-

ulation agreements with UNH-Manchester and Plymouth State University.

As the field of robotics continues to grow and expand its reach into fields that range from manufacturing to health care to the military, programs such as NHTI's will meet the challenge of providing skilled professionals to fill that expanding need.

For more information about NHTI-Concord's Community College and its Robotics and Automation Engineering Technology program, visit nhti.edu. ■

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

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U.S. Department of Labor Bureau of Labor Statistics. (2019). *Occupational outlook handbook*. Retrieved from <https://www.bls.gov/ooh/>.

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Celebrating Career and Technical Education

By Jeannine Kunz

WITH THE URGENT NEED FOR A SKILLED MANUFACTURING WORKFORCE, EDUCATORS

and manufacturers alike are trying to find ways to educate students and future potential employees on the benefits of a career in manufacturing. Some of the most significant contributions toward this effort are career and technical education (CTE) programs in high schools across the country. From simulated workplaces to industry partnerships, CTE programs focused on manufacturing are an invaluable resource for local communities. These programs provide students with excellent technical and career-ready training to prepare them for jobs with advanced manufacturing companies that so greatly need a fresh pipeline of highly skilled workers.

According to the Association of Career and Technical Education (ACTE) (2019), CTE serves 94 percent of all high school students. More than 7.5 million secondary students have taken at least one unit of CTE credit. ACTE suggests that high school students involved in CTE are more engaged, perform better and graduate at higher rates.

CTE has a long history in the U.S. While this center of learning produces some of the best and brightest talent, equipped with skills demanded by the labor market,

many high school programs face financial challenges that threaten their very existence. Continued budget cuts make it difficult for schools to invest in up-to-date curriculum, equipment and technology, and this lack of funding impacts a school's ability to develop the next generation of workers.

However, many high school CTE programs won't be left behind; they are taking matters into their own hands, implementing business strategies to sustain and grow. Progressive CTE programs thrive because they align externally with industry, and internally with others in the school network. While some schools try to remain relevant, the most sustainable CTE programs turn to business practices for success.

We recommend these five steps to get started with the internal community:

1. Create a strategy that aligns with central administration goals. It's important to create a five-year education and growth strategy for the advanced manufacturing career cluster within the CTE program.
2. Build champions. While it's critical to engage the ultimate decision maker — such as an administrator or board of education — in development of goals and strategy, think more broadly. How can other teachers and counselors collaborate and contribute?

3. Create an annual business plan. CTE program instructors should explain their business to administrators as if pitching an investor. A business plan helps tell a compelling and succinct story.
4. Make a business case for funding. CTE teams should be prepared to defend their budget, whether covering personnel, professional development, equipment, online training, technical certifications or supplies. If asking for a budget increase, clearly explain why.
5. Showcase student success and opportunities. The best way to get students into seats is to demonstrate the result of their time in the CTE program. It's important that students and their parents see how CTE will launch students on a career path, providing opportunities for them to gain credentials and certifications tied to their specific skill set leading to employment.

Many CTE programs across the country related to manufacturing fields, such as computer numerical control machining and welding, are burdened with outdated curriculum and technology. To ensure students are prepared to work at modern manufacturing facilities, it is important for industry and education to work together



to bring industry-relevant knowledge and skills to the classroom.

Organizations such as the SME Education Foundation are valuable partners as schools consider the best ways to strengthen programs that provide pathways to rewarding careers in manufacturing. These groups can share experience from interactions with networks of programs across the country, and they ensure schools avoid reinventing the wheel. For instance, SME Education Foundation's Partnership Response In Manufacturing Education (PRIME) provides opportunities for students to develop industry-relevant knowledge and advanced manufacturing skills before they graduate from high school.

To engage the external community, we recommend the following six tips for effective outreach:

1. Reach out to industry representatives. Open a conversation with local manufacturers about the knowledge and skills they need for their businesses to grow. What is the market need? Take the feedback and integrate it into a practical curriculum with practical hands-on skills.
2. Standardize training. Often CTE programs are built around an instructor's expertise rather than what is needed by industry. Recently, more programs are

looking at standardization of content and a framework built on competencies.

3. Welcome the local community. Rather than approaching a company or community leader with an open hand, asking for money, a warm invitation to get involved with the program can be a better introduction.
4. Re-educate the community. Manufacturing remains a misrepresented industry. It is important to educate parents and counselors as well as students about the many rewarding and lucrative career opportunities in the field.
5. Engage students. Students are perfect ambassadors for the program. Introducing ways for them to gain valuable experience while sharing their expertise offers mutual benefits.
6. Share, share, share. Every meeting is an opportunity to share stories about students and the program, which can lead to offers of support.

By adopting a business approach, aligning externally with industry and internally within the school network, many manufacturing CTE programs are successfully addressing development and funding challenges. Moving toward a more business-oriented approach is a winning strategy for all:

- CTE programs become sustainable while launching their students into successful careers
- Students obtain real-life work experience, resulting in good jobs and salaries
- Manufacturers gain access to a solid pipeline of skilled workers that will help their businesses grow well into the future
- The economy strengthens from the resulting business growth

The bottom line is that manufacturing CTE is essential for solving the skills gap. ■

REFERENCE

Association for Career and Technical Education. (2019). About CTE. Retrieved from <https://www.acteonline.org/about-cte/>.

EXPLORE MORE

To learn more about innovative approaches to CTE education, download Tooling U-SME's white paper, *Making the Grade: Schools Adopt Business Approach to Develop the Next Generation of Manufacturing Workers*, at [toolingu.com/resources/white-papers](https://www.toolingu.com/resources/white-papers).

EVENTS CALENDAR



Leadership Conference

MARCH 11-13
NEW YORK, NEW YORK
acteonline.org/region-i-event



2020 NATIONAL
POLICY
SEMINAR

MARCH 29-APRIL 1
ARLINGTON, VIRGINIA
acteonline.org/nps



Leadership Conference

APRIL 15-17
NEW ORLEANS, LOUISIANA
acteonline.org/region-iv-event



Leadership Conference

APRIL 22-25
LAKE TAHOE, NEVADA
acteonline.org/region-v-event

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Revolution



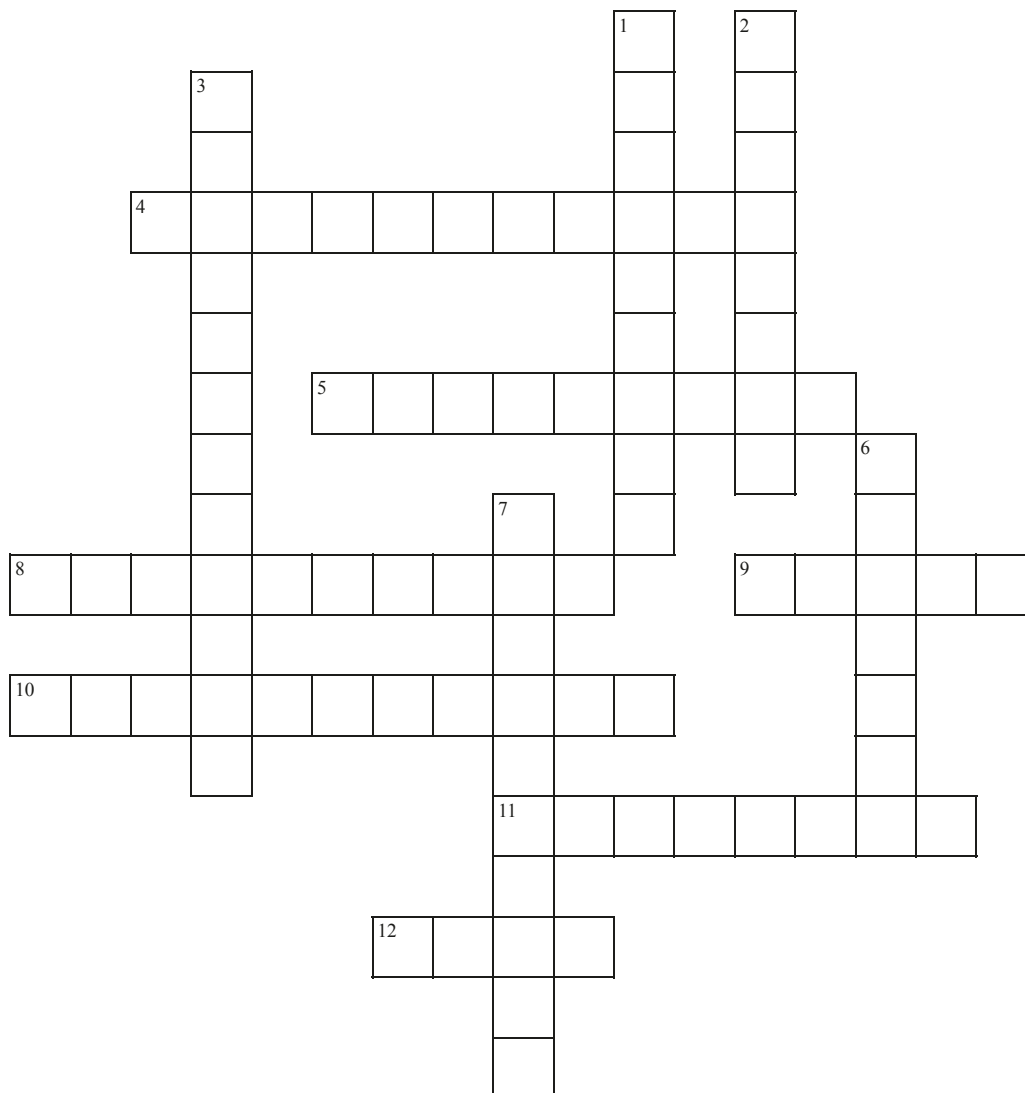
JUNE 9-12
CINCINNATI, OHIO
acteonline.org/leading-the-education-revolution-conference



Leadership Conference

JUNE 17-19
PRIOR LAKE, MINNESOTA
acteonline.org/region-iii-event

EXPERIENTIAL LEARNING AT WORK



Across

4. Florence Gold asked, "Why is space [blank] important?"
5. Type of learning at the heart of this issue
8. CTE serves this percentage of high school students
9. Acronym for High School Students United with NASA to Create Hardware
10. Last name of Patrick, vice president of ACTE's Administration Division
11. Last name of Nancy, ACTE's board of directors president
12. Central [blank] Career Center in Greenwood, Indiana, is home to a noteworthy athletic training and exercise science program.

Down

1. State to host ACTE's Region IV Leadership Conference this April
2. Some thought space was the final one of these, but the National Science Foundation sees new challenges as humans and technology converge
3. Partner organization with which ACTE is "expanding the scope of high-quality online professional development available to our members"
6. Fixed or growth, for example. In this issue, Delgatto promotes benefits of an entrepreneurial one.
7. Tool under development by NASA HUNCH students in Glenelg, Maryland, for collection of space rocks



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