

# Techniques

MAY 2020

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## ***PROFESSIONAL DEVELOPMENT***

- 5 Key Strategies for Richer PD
- How Data Analysis Drives PD & Improves Classrooms
- Solve the Booming Shortage of CTE Teachers
- Make a CASE for Agricultural Science
- UDL & CTE Educators: Success for All Students



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## PROFESSIONAL DEVELOPMENT

**WE ARE LIVING IN UNPRECEDENTED TIMES! WE HEAR THIS HOURLY ON THE TV, INTERNET AND AT THE OPENING OF EVERY EVENT, NEWS BROADCAST AND SPEECH FROM OUR GOVERNMENT**

officials. Everything we knew a week, a month or a year ago will be different going forward. Our personal, social and professional interactions will

be shaped as a result of the pandemic of 2020. Working, teaching and learning from home, just weeks ago was uncommon for many of us. Today, as I write this, it is a reality for most, if not all of us. Everything we know, have done and will do in the future may be different. It is 2020, and our everyday lives have been "reinvented" and will continue to be reinvented at a speed that is hard to imagine. It is a time of change and a bit of uncertainty. However, it is also a time of great opportunity to change the way we teach, learn and do business! What will not change is the need for quality career and technical education.

This month's *Techniques* magazine is focused on professional development and addresses a variety of topics relevant across all of CTE. ACTE's *Quality CTE Program of Study Framework*, with its 12 elements and 92 criteria, is the basis for continued program self-evaluation, program improvement and collaboration at all levels of education. Specifically, the Prepared and Effective Program Staff element "addresses the qualifications and professional development of program of study staff including secondary CTE teachers, postsecondary CTE faculty, administrators and other personnel."

I hope you will find great value as you read about the resources provided to more than 19,000 educators as they engage and prepare students for successful careers through the SkillsUSA Framework. Catch up on CTE teacher preparation and accountability, teacher recruitment, and data reflecting a strong demand for CTE teachers nationwide. Check out Classroom Connection to read eight tips for self-improvement or learn about data-driven professional development in Pennsylvania "where they are using third-party industry standards and credentials to evaluate program progress and student success as a method to align with Perkins V requirements."

Expand your knowledge about "barriers in industry-specific professional development" and increasing access with techniques to serve all students. Read about strategies that serve all students preparing for successful college and career experiences. And finally, want a turn key program to deliver academically/STEM-infused project-based learning while meeting the elements of ACTE's high-quality CTE framework? Read about the Curriculum for Agricultural Science Education (CASE) initiative and its impact nationwide.

Professional development has many levels. Tools for personal growth and development are easily accessible through state and regional ACTE programs and ACTE's online learning tool, CTE Learn. As an ACTE member, you have the opportunity to take advantage of all the value-added resources.

Everything will be different after we recover from the pandemic impacting us in 2020. Professional development will continue to evolve and be delivered in every possible shape and form. Our opportunities for professional development will be limitless! The challenge continues to be choosing which method or delivery works best for you. ACTE's offerings will continue to serve our programs, districts, states and educators virtually and in person. The rest is up to you to choose. Take advantage of the offerings and take yourself to the next level. The articles in this issue are a great place to start.

As I conclude my term as ACTE president, I want to share how honored I have been this year to serve you! I have met excellent educators nationwide; worked with CTE staff at middle, secondary and postsecondary levels; and interacted with vendor partners and industry representatives who are focused on career and technical education. I have and will continue, to work with an outstanding ACTE staff focused on the success and growth of our organization. Thank you for this opportunity to serve. I am confident that career and technical educators' best interests are in good hands with ACTE support, advocacy and promotion.

Nancy J. Trivette

ACTE BOARD OF DIRECTORS PRESIDENT

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# Summer Professional Development Workshop for CTE Teachers



## CREATIVE AND INVENTIVE PROBLEM SOLVING: A Proven Approach for Integrated STEM Education

July 29-31, 2020

### A Three-Day Workshop at the Massachusetts Institute of Technology

The Lemelson-MIT Program (LMIT), located within the School of Engineering at the Massachusetts Institute of Technology (MIT), has been helping K12 teachers and students across the U.S. learn how to invent technological solutions to real world problems for over fifteen years. Recent studies confirm the positive impact our programs have on the development of creative and inventive mindsets that are critical to young people's ability to thrive in today's technologically driven, rapidly changing world.

#### Teachers tell us that their work with LMIT:

- 83%** | Was a life changing experience
- 91%** | Changed the way they teach
- 90%** | Connected them to a network they professionally gained from
- 86%** | Helped them to acquire additional funding

Our evidence-based model transforms educators' approach to facilitating student learning and helps schools and districts make connections to STEM professionals in their communities. We are now sharing what we have learned with educators across the U.S. at the leading educational institution for innovation in the world.

**WHO SHOULD ATTEND:** Middle and high school educators and district leadership teams who want to enrich students' educational experiences through inventing technological solutions to real-world problems. Multiple educators from different career pathways are encouraged to attend.

**WHAT YOU WILL LEARN:** The workshop will develop educators' and administrators' capacity to help students learn to think and act as inventors. It will offer strategies for overcoming known barriers to integrated STEM and the transdisciplinary nature of teaching embodied by invention education within career and technical education.

## LEMELSON-MIT

**LEARN MORE:** Discover how CTE teachers have made an impact by reading our educator case studies at [lemelson.mit.edu/resources](https://lemelson.mit.edu/resources)

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# PROFESSIONAL DEVELOPMENT TIPS AND GOALS

By Denise Paley

**WE ARE IN THE BUSINESS OF LEARNING. PROFESSIONAL DEVELOPMENT IS INTEGRAL TO OUR WORK;** therefore, districts often have a requisite number of hours per year per teacher. How do you *own* your professional development? Itemized below are tips and reminders of how you can enhance your learning. After all, learning is why we chose this profession.

## Learn from other teachers.

Every teacher in the district teaches differently. By visiting other classrooms, we may find techniques that the German teacher has for teaching vocabulary, strategies

that the health teacher has for student engagement and classroom-management methods that the science teacher uses. As the only Family and Consumer Sciences (FACS) teacher in my district, I was forced to look beyond the FACS classroom for collaboration. It turns out that this expansion was spot-on: I had plenty of content but found ideas on how to deliver the content from colleagues outside of my discipline. The new eyes of a beginning teacher offer a unique opportunity for fresh thinking and innovative approaches — invite them into your classroom for open-minded critique. Being a mentor to a new

teacher helps both parties grow, and it expands the credibility of your discipline. Our FACS class benefits directly from collaboration with other teachers: This past year, we presented an etiquette luncheon with the business class, prepared and compared convenience versus homemade products with the College Nutrition Health class, and shared ethnic dishes with the Spanish class. Collaboration is key to developing project-based learning experiences.

## Learn from the students.

Beyond the obvious computer tips gained from students almost daily, students have taught me when chickens stop laying eggs and what type of tree yields the most profitable wood. Other than facts, though, I remain acutely aware of how students think differently from me. I cherish when a student says to me, “I know a better way to approach this problem.” When a middle school student has the metacognition to articulate their method of thinking, we have achieved a vital employability skill.

## Join a professional organization (or two or three).

The benefits of joining a professional organization are numerous. Professional development specific to your discipline and networking head the list. The resources obtained at professional conferences provide turnkey lessons as well as contacts for future exploration. I have always come back with more ideas than I could implement in a lifetime! Each organization grows with its members; it is a personal growth experience to hold an office or join a committee. When presenting your own best practice at a conference or a local workshop, you will find more clarity as well as gain input from the audience.

We have a responsibility to our professional organizations to maintain high standards and to expand our membership. We ensure professional development opportunities by supporting the organization. Bring a colleague to a meeting, nominate teachers for awards, pay for a college student to begin their membership, and continually ask, “What can I do to support my professional organization?”



### Be a lifelong student.

Stretch your learning by enrolling in courses and workshops, visiting classrooms, attending webinars, exploring internet resources and networking. Stay up to date on changes to federal and state education policy (another benefit of professional organizations). Stay educated about education. Have you considered beginning the process for national teacher certification? For me, it was a journey available after graduate school. It is specific to one's discipline and yet encompasses universal teaching standards for personal implementation.

### Assist the state education department.

You are the resource that the state education department needs to write curriculum, answer surveys, grade teacher-certification assessments, contribute to committees and generally respond as needs arise.

This interaction places you in the forefront of new initiatives so that you are planning the future of our profession. I'm a writer of our middle school state CTE curriculum, and my suggestion to include a unit on sustainability gained acceptance — it is thrilling to have that kind of input!

### Read books.

Host a book club in your school. Reading and discussing pedagogy with fellow teachers is enlightening. Before a conference, I always read the book written by the keynote speaker to lay the groundwork and enhance my learning. I was so captivated by Mark Perna's message that I purchased an autographed copy of his book, *Answering Why*, for my principal, both as a thank-you for allowing me to attend VISIONS and as a point of discussion for our CTE department.

### Participate in social media.

Social media is our revolutionized form of networking. Ideas are shared online as well as social support. No one understands a teacher as well as a fellow teacher.

### Set SMART goals.

Our district elicits SMART (specific, measurable, achievable, relevant, time-bound) goals from every teacher each year. I post mine next to my computer as a reminder to take steps to get closer to the goal. Each district presents professional development for teachers. When the goals of the district and the goals of the teachers are aligned, the students benefit. Recently, I attended a workshop with Ray McNulty on the future of education. He encouraged teachers to live at the "edge of your competence." Set your goals to stretch your learning as well as that of your students.

### Ask questions.

Everyone knows something that you don't. "Professional development" is not a new term or a new concept, but it is one in which we all can and should expand our learning. When you focus on the learning process, you can empathize with that student sitting in your classroom. Take charge of your own professional education so you can be better teachers, members and leaders. Personal growth occurs when we go beyond our comfort zones. ■

"If you want something you've never had you must be willing to do something you've never done."

—Thomas Jefferson

**Denise Paley** is a Family and Consumer Sciences/CTE teacher in the rural district of Marion, New York. Her background prior to teaching was in the food-service industry. She is the current president of the New York State Association of Family and Consumer Sciences Educators and is a National Board Certified Teacher. Email her at [dpaley@marioncs.org](mailto:dpaley@marioncs.org).

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# PREPARED AND EFFECTIVE PROGRAM STAFF

By Catherine Imperatore

**THERE IS NOTHING MORE IMPORTANT TO STUDENTS' LEARNING THAN THE QUALITY AND DEDICATION OF** their teachers. This conventional wisdom is backed by research: Teachers matter more to student achievement than any other aspect of schooling, according to a literature review by the RAND Corporation; and We Are Teachers reports that 88% of individuals say that a teacher had a significant, positive impact on their life (Darling-Hammond et al., 2017). For these reasons, Prepared and Effective Program Staff is one of ACTE's 12 elements of high-quality CTE within the *Quality CTE Program of Study Framework*.

The Prepared and Effective Program Staff element of ACTE's quality framework includes seven criteria that address the qualifications and professional development of program of study staff, including secondary CTE teachers, postsecondary CTE faculty, administrators and other personnel that support both instructors and students. The criteria listed below are from the 2018 version of the *ACTE Quality CTE Program of Study Framework*.

## Criteria for High-quality Program of Study Staff

- a. CTE staff supporting the program of study meet appropriate state, district and/or institution certification and licensing requirements.
- b. CTE educators maintain up-to-date knowledge and skills across all aspects of an industry.
- c. CTE educators maintain relevant evidence-based pedagogical knowledge and skills.

High-quality programs of study are founded on staff, including teachers and faculty, administrators, counselors, support personnel and paraprofessionals, who are licensed or certified in accordance with the requirements of the state, district and/or institution. When qualified staff are hard to find, CTE leaders can pursue creative options, such as developing intensive induction programs for pro-

visionally certified instructors, pairing new teachers with fully licensed instructors, and enabling in-person or virtual access to industry experts.

In addition to their initial qualifications, CTE educators must have and continually refresh both their industry- and occupation-specific knowledge and skills as well as their knowledge and skills for effective and equitable teaching and classroom management. Instructors with expertise in both of these areas can better support students to develop relevant technical, academic and employability skills, explore careers, and meet their goals. This can be challenging for today's CTE educators, as many come into their roles with a background in either education or business and industry but not both.

- d. CTE staff engage in ongoing, rigorous professional development on a wide range of topics covering all elements of a high-quality program of study, as described in ACTE's *Quality CTE Program of Study Framework*, which might include pursuit of advanced educator certification.
- e. CTE staff demonstrate leadership and commitment to the profession.

To maintain and expand their skills and knowledge, CTE educators and other program of study staff must have opportunities to engage in high-quality professional development. In the Strengthening Career and Technical Education for the 21st Century Act (Perkins V), this term is defined as "sustained ... intensive, collaborative, job-embedded, data-driven, and classroom-focused." This definition echoes the description of professional development in Perkins IV and also aligns expectations with the Every Student Succeeds Act. There is evidence that professional development designed with these characteristics is more effective in changing teacher practice and supporting student learning (Darling-Hammond et al., 2017).

Educators in high-quality programs of study should have access to these sustained, rigorous professional learning



experiences in alignment with the needs identified in their community through the Perkins V comprehensive local needs assessment. A coordinated annual plan for professional development can help ensure that a variety of relevant content is covered and may extend to professional development plans for individual staff members. Appropriate funds should be budgeted to cover costs for required or approved activities, and whenever possible, participants should be able to earn professional development or articulated credit.

While not required, one avenue for professional learning is advanced certification through the National Board for Professional Teaching Standards, which is available in a number of CTE specialty areas. Research has documented positive impacts for students whose teachers are Board certified, and Board certification can open doors to leadership positions. Other ways for educators to continue their learning and to support the profession include volunteering with a relevant professional association, serving as a career and technical student organization (CTSO) adviser, or mentoring a new teacher.

f.

CTE administrators ensure that other program staff have the time, resources and supports to implement each element of a high-quality program of study, as described in ACTE's *Quality CTE Program of Study Framework*.

g.

CTE and academic staff collaborate regularly and frequently to coordinate curriculum, instruction, assessment, and extended learning activities and to analyze data for program improvement.

To successfully implement high-quality programs of study, program staff must not only engage in professional learning but also collaborate with business and industry partners, coordinate work-based learning and CTSO activities, analyze student data, and stay up to date on labor market information, among other tasks. One of the most important and challenging responsibilities of a CTE administrator is ensuring that educators and other staff have the funds,

time and encouragement to engage in these activities during the school day. In particular, educators should have regular access to colleagues within CTE departments; in academic, counseling/advisement and other departments; and across learner levels to coordinate curriculum and instruction, develop opportunities for career exploration, and analyze data. This collaboration helps to break down silos and leverage different perspectives for program improvement.

Additional criteria in the Career and Technical Student Organizations and Work-based Learning elements of the ACTE framework address the importance of clearly defined roles and supports for staff delivering these learning opportunities. In addition, a criterion in the Sequencing and Articulation element describes the need for collaboration among secondary and postsecondary staff for CTE course sequencing, articulation and transfer.

### Success Strategy: Teacher Externships

Round Rock Independent School District in Texas collaborates with the Round Rock Chamber of Commerce to provide summer externships for middle and high school teachers, counselors, and administrators in CTE and other academic content areas to help them stay up to date with business and industry trends. For three days each summer, participants shadow local employers relevant to their subject area or position in the school district. Educators are paid \$500 plus a \$50 gas card and earn 24 hours of professional development credit. Upon completion, participants develop and present a lesson plan that highlights what they learned. Past participants cite benefits from the program, including learning more about day-to-day business operations and forming stronger partnerships.

### Learn More and Assess Your Programs

Practitioners can turn to ACTE's High-quality CTE Tools online library for resources on the preparation and development of program of study instructors, administrators and other professionals. The Prepared and Effective Program Staff section features information on state CTE licensure requirements, case studies about

professional learning communities and teacher induction programs, and CTE professional development models.

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 Prepared and Effective Program Staff 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](mailto:cimperatore@acteonline.org).

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High-quality CTE Tools Online Library: [acteonline.org/high-quality-CTE](http://acteonline.org/high-quality-CTE)

*Quality CTE Program of Study Framework and Self-evaluation Instrument:* [acteonline.org/high-quality-CTE](http://acteonline.org/high-quality-CTE)

*This column was prepared prior to school closures resulting from the COVID-19 epidemic. Some activities highlighted here, such as teacher externships, will likely not be possible in 2020. Keep up with ACTE's response to COVID-19 at [acteonline.org/acte-response-to-coronavirus](http://acteonline.org/acte-response-to-coronavirus), and access our growing list of distance learning resources for CTE educators at [acteonline.org/professional-development/opportunities/distance-learning-resources](http://acteonline.org/professional-development/opportunities/distance-learning-resources).*



# CTE AND CAEP: AN IMPORTANT PARTNERSHIP FOR THE FUTURE

By Christopher Koch

## THE COUNCIL FOR ACCREDITATION OF EDUCATOR PREPARATION (CAEP) IS THE ONLY NATIONAL

accreditor of educator preparation recognized by the Council for Higher Education Accreditation, and it results from the merger of two prior accreditors. CAEP has accredited more than 300 providers. Approximately 10% of CAEP-accredited providers are preparing career technical educators. More Science, Technology, Engineering and Math (STEM) and Career and Technical Education (CTE) teachers are needed to address shortages, and state CTE plans may be a vehicle for addressing

these. According to a 2017 survey, conducted by the national nonprofit Advance CTE, states are experiencing severe CTE teacher shortages in manufacturing (81%), IT (73%), health sciences (71%), and STEM (71%) (Advance CTE, 2018). State partnerships with CAEP can ensure providers meet quality standards, while more providers of CTE teachers can address shortages.

Accreditation serves two purposes: accountability and continuous improvement. CAEP requires that applicants meet five research-based standards:

- content and pedagogical knowledge
- clinical partnerships and practice
- candidate quality, recruitment and selectivity
- program impact
- provider quality assurance and continuous improvement

Applicants for accreditation must provide evidence that they meet each of the five standards. CAEP requires that outcome evidence be demonstrated to meet the standards, which is a different and higher standard than past renditions of accreditation. Approximately 12% of applicants for accreditation received the status of probation, with another 3% being revoked or denied accreditation.

## CAEP and CTE Standards and Philosophy

The CAEP standards support the goals of CTE: They are tailored to ensure that the preparation of educators meets employment needs through clinical preparation and career readiness of both candidates and K-12 learners. Accreditation based on these standards ensures that candidates from career and technical education preparation providers are ready to make an impact on K-12 student learning on the first day they enter the profession. Whether a teacher is prepared at a traditional university, a community college, an alternative provider, or even a trade union, the standards provide quality assurance that CTE candidates have the necessary training to positively impact the students they serve.

CTE programs provide strong teacher preparation for applied math and science.



CAEP standards support strong preparation, clinical experience and evidence which mirrors the CTE philosophy of applied learning.

Further, CTE teachers are effective in motivating K-12 learners through the application of learning. This motivation will yield improved K-12 performance, which providers seeking CAEP accreditation address through the accreditation process (CAEP Standard 4).

## CAEP State Partnerships and Perkins V

The “Strengthening Career and Technical Education for the 21st Century Act (Perkins V)” was signed into law on July 31, 2018. This bipartisan measure reauthorized the Carl D. Perkins Career and Technical Education Act of 2006 (Perkins IV) and continued Congress’ commitment in providing nearly \$1.3 billion annually for CTE programs for our nation’s youth and adults.

Perkins V represents an important connection to expand opportunities for every student to explore, choose, and follow career and technical education programs of study and career pathways to earn credentials of value. As states and local communities embark on the development of new plans for CTE, state partnerships with CAEP will be advantageous to leverage and pursue. The 2019–20 school year statistics from the U.S. Department of Education show that a total of 30 states have identified shortages of CTE educators, and Perkins V requires that state plans include a description of how states recruit, retain and provide professional development to increase teacher licenses and certification in these shortage areas. In accordance with CAEP Standard 3, providers pursuing CAEP accreditation must

demonstrate that, “the quality of candidates is a continuing and purposeful part of its responsibility from recruitment, at admission, through the progression of course and clinical experiences, and to decisions that completers are prepared to teach effectively and are recommended for certification.” The provider demonstrates that development of candidate quality is the goal of educator preparation in all phases of the program. This process is ultimately determined by an Educational Proficiency Plan meeting CAEP Standard 3. States that currently require CAEP accreditation promote CTE programs in a number of ways. For example, Virginia offers a provisional certification, and Alaska partners with Educators Rising to recruit and retain personnel. The Southern Regional Education Board (SREB’s) Teaching to Lead program is partnering with a number of states to assist individuals previously involved in business and industry to make the transition into teaching.

## Recommendations

Trade unions should consider becoming alternative providers of teachers. State legislation and regulations should be modified to support this potential conduit for quality teachers and, like Virginia, should allow for reciprocity from other CAEP-accredited providers.

## State CTE plans can be used for recruitment and retention of teachers in shortage areas.

States should reach out to both traditional and nontraditional preparation entities in planning for a strategic use of federal CTE funding.

Alleviating shortages is another challenge states must address, and it is a chal-

lenge the CTE community understands. Whether it is science, math or engineering, there is a common foundation of knowledge and standards. CAEP standards for preparing teachers are the basis of what educators need to be able to do when they are working with students, regardless of subject matter. There is every reason to promote reciprocity between states for CAEP-accredited providers, whether a traditional brick-and-mortar institute of higher education or an organized labor group. Reciprocity will help to alleviate shortages, especially during this time of high mobility. Virginia has provided a model for such reciprocity which assists with licensure and employment verification.

Strong preparation, clinical experience and applied learning are concepts that we all should support in teacher preparation. The CTE community understands this better than most and leads the way in preparing our students in the application of learning, especially in the STEM fields. CAEP accreditation builds on these CTE components to help drive the entire profession to new levels. ■

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**Dr. Christopher A. Koch, Ed.D.**, was appointed CAEP president in October 2015. He previously served as Illinois state superintendent of education from 2006 through 2015. Koch has experience as a special educator, having taught in four states in various settings, including an Outward Bound program, a college preparatory school, a youth detention center and a psychiatric hospital. He served at the federal level with the U.S. Department of Education’s Office of Vocational and Adult Education, where he administered programs in correctional education and school-to-work transition.

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# Strategies to Increase CTE Teacher Recruitment, Engagement and Retention Through Professional Development

By Shani Chen & Cheryl Ney



**D**eveloping sustainable career pathways is the key to meeting workforce needs, but administrators in the Los Angeles region have growing concerns about more effective ways to recruit and retain qualified career and technical education (CTE) teachers. The current shortage has left administrators in a difficult position because the success of their CTE programs and opportunities for students depend on an increasingly scarce supply of instructors (Chen & Ney, 2019; Ball, 2016). The shortage of credentialed CTE teachers also jeopardizes the development of new pathways and the sustainability of existing pathways, as districts simply cannot find qualified industry professionals. Some schools experiencing the repercussions are now forced to turn away interested students from the increasingly popular CTE programs due to being understaffed.

A recent study conducted at California State University LA's Charter College of Education examined the perceptions of CTE teachers, school administrators and industry experts about their needs to foster and sustain pathway programming through regional professional development (PD) opportunities in Los Angeles (Chen & Ney, 2019). In conducting nine interviews with administrators, two industry experts and a focus group of six CTE teachers, each district faced its own set of challenges. The participants all share common themes in identifying the need to place a higher priority on the five key strategies below. The emphasis on these objectives would not only provide richer PD experiences, but also increase engaged professional learning to improve instruction for current and prospective educators, while positively impacting teacher retention and recruitment.

## 1. Increase Awareness Among Faculty and Staff About CTE Opportunities

Creating greater awareness to recruit teachers can help increase interest in the career benefits and leadership opportunities, which can minimize confusion or preconceived misconceptions. Districts are more intentionally identifying active

academic teachers with previous work experience, who could potentially qualify for a CTE credential ahead of time. However, a sizable number of single-subject teachers could become dual credentialed as a result of their prior work experience in other sectors (Chen & Ney, 2019). Identifying these types of candidates can provide growth opportunities for interested educators.

The consensus from the participants indicates limited CTE information and understanding among the professional learning community.

Old institutional norms still permeate school cultures around vocational education, so the revitalization of CTE requires reeducating stakeholders, which is being overlooked.

This is a necessary step to redefine CTE, reset core values, reeducate support staff and teachers to inspire an open mindset, garner buy-in and encourage stakeholders to engage in new opportunities.

The first strategy is to conduct in-depth interest surveys and target qualified teachers. This data can provide the administration more information about teachers' prior work experience, which can mark the beginning of an intake process that can be followed up with an informational session for recruitment.

The informational sessions can generate interest by outlining the reasons why one would want to earn a CTE credential, as well as highlighting the benefits and incentives. Single-subject teachers with a CTE credential identified the process to earning a CTE credential as cryptic for the average end user; they had questions but felt uncertain about how to get them answered.

CTE teachers identified a need for more live interaction to get more information, and they outlined where they often felt confused about various career opportunities for earning a CTE credential. Being more informed about the various ways to make a positive impact can generate leadership interest and opportunities through identifying career benefits and learning about the

value of holding a CTE credential. Bottom line: The lack of transparency created confusion; teachers had questions, and the resources were not readily available, which acts as a barrier in any recruitment initiative. As a part of information initiatives, interested teachers can be provided personalized support and assistance throughout the credentialing process.

A systematic approach to recruitment through dual-credentialing promotion can facilitate additional "recruiting opportunities" for candidates to earn a CTE credential. This is a key component in attracting teachers to CTE because "the pipeline for well-prepared teachers is operating at a trickle compared to the floodgates of students enrolling in programs" (Ball, 2016).

## 2. Invest in Building CTE PD Differentiation Alongside Industry-specific Sectors

Let's face it, PDs vary greatly and often are perfunctory. With so many initiatives to cover, PDs can become overloaded, fragmented and ineffective. Instead of integrating evidence-based findings about what works for students and facilitating collaboration among participants, administrators identify where PDs fall flat while persistent barriers prevail that prevent CTE teachers' growth opportunities. PDs do not have the depth to address the content CTE teachers need through appropriate sequencing, duration and quality of instruction for sustainable growth (Bottoms, Egelson, Sass, & Uhn, 2013).

Without industry-specific PDs with embedded differentiation for new and veteran teachers, administrators expressed that they are saddled with front-loading a lot of industry-specific information, leaving them overwhelmed, which translates to a lot of explaining versus engaging, interactive and interesting presentations. These PDs are viewed as minimally effective due to limited participation and exposure in one-day workshops on site with "industry experts who may know little about the school's individual needs" (Sturko & Gregson, 2009). Furthermore, administrators

expressed challenges in providing access to quality PDs because industry partners are not always readily available.

The second strategy is focused on personalizing career-pathway PDs through backwards mapping, which designs instruction and learning experiences to meet targeted learning goals. This instructional planning approach focuses on what learning outcomes should look like in a classroom that aligns with both the 21st century learner and the 21st century workplace. This outlook resonates not only with CTE and academic teachers but also with industry partners. The priority here is to identify a region's workforce needs and create alignment through contextualization and a shared vision to cultivate long-term relationships to strengthen workforce initiatives.

Keeping up to date with industry standards creates a barrier, since changes in CTE credentialing no longer require teachers to renew their credentials, meaning teachers are not held accountable to update their knowledge on a particular area of focus, making access to industry-specific PDs essential.

Curating industry-specific “ecosystems” or professional learning communities to address the support and investment is essential to build differentiation for CTE teachers that support ongoing professional learning,

such as externships, job shadowing and mentoring to increase teacher engagement and learning throughout the year.

### 3. Develop More Effective Professional Support Systems

Today, CTE teachers share many of the same responsibilities as single-subject teachers, yet they seem to have limited access to resources, such as peer collaboration, lesson planning with non-CTE teachers and traditional PDs. As a result, CTE teachers are at a professional disadvantage when they are kept out of the academic

loop, such as reading and math achievement, English language learning (ELL) or special education initiatives.

CTE teachers are less experienced in areas like classroom management and differentiation; administrators have identified that CTE teachers need more depth of knowledge in theoretical content, such as pedagogical approaches that work for ELL students and students with special needs. They need support to better align lesson plans to the CTE content standards as a foundation to facilitate more effective learning connections with students (Chen & Ney, 2019). While experiential learning is a CTE teacher's area of strength, becoming proficient in curriculum principles can greatly support teachers when crafting relevant and exciting lesson plans alongside mentors and academic teachers.

The third strategy that fosters peer collaboration and mentorship increases interaction, which in turn positively impacts student achievement through learning outcomes (Warner, Caspary, Arshan, Stites, Padilla, Patel, & Adelman, 2016). Through peer exposure in professional learning communities, peer observations and shared planning periods, working in teacher teams can strengthen connections and contribute to nurturing a deeper pedagogical knowledge while enhancing lesson plans by aligning them with all content standards.

For example, classroom observations can provide rich data to receive constructive feedback, but they are often perceived as negative or punitive if a culture of silos and infrequent observations is a norm. Striving to cultivate consistent and constructive feedback from peers and coaches can identify areas for growth and innovation. This transformational approach takes time to cultivate and shift away from a closed- to an open-door policy, thereby encouraging positive peer observations, fostering collaboration and moving toward a growth mindset among staff, as well as stewarding and strengthening a professional community.

Efforts to increase student learning outcomes should drive true teacher col-

laboration, but the collaboration piece often brings up another issue among academic teachers' attitudes toward CTE teachers. The study identified where some administrators struggle with traditional thinking among teachers, leadership and gatekeepers about vocational education, and this older ideology is restricting the development of 21st century CTE opportunities (Chen & Ney, 2019). Barriers like this perpetuate other areas of concern, such as cultivating excitement among staff for authentic integration, relevance and continuity to ensure pathways will succeed (Hammond, Flook, Cook-Harvey, Barron, & Osher, 2019).

### 4. Increase CTE Value

Institutional barriers continue to perpetuate deficit thinking among school districts because CTE courses are not prized; old ideas of “vocational” education persist. The study identified that educators' perceptions of vocational education are not held in as high esteem as academic teachers'. This hierarchy among academic teachers often exudes a sense of entitlement that contributes to contentious relationships, stressing that academic courses are more valued; these mental models are pervasive and have cultivated collaborative disdain among the two groups.

While CTE's popularity has attracted a lot of attention in its efforts to meet 21st century college and career readiness, these courses still have to compete with Advanced Placement or International Baccalaureate classes. Administrators and teachers expressed frustration with the existing perception that CTE pathways and classes are electives rather than effective programming, such as the Linked Learning approach that aligns curriculum with both rigorous academics and CTE, alongside work-based learning and student support services (Chen & Ney, 2019).

A fourth strategy creates more equity for teachers in CTE pathways, which can occur by cultivating mindset shifts for teachers, administrators, parents and students, as well as providing financial incentives for CTE teachers to continue



pursuing higher education and earn a bachelor's degree. As teachers are more invested and professional learning communities are more inclusive, the impact can become an effective component to empower teachers.

Reshaping these perceptions about 21st century CTE will continue to be a top priority because outdated ideas of vocational education continue to reemerge throughout the implementation and adaptation process from stakeholders. Reevaluating institutional norms regarding academic prestige is at stake; as one industry expert succinctly stated, there is a sense from families that the "real work" is done in

While incremental changes are taking place, CTE pathways have yet to reach a tipping point in a competitive curricula capacity.

meeting A-G high school requirements. Raising the standard and promoting continued education can positively impact societal norms. However, the stigma within the educational community first needs to foster a continual conversation on rebranding and promoting CTE as viable career paths. Leadership and CTE programs still have to strive to take positive steps to cultivate a robust future workforce; and industry partners, parents and students need to continue to be more informed and apprised of the value of CTE programs; if not, districts will continue to face challenges and obstacles from those resistant to change.

## 5. Engage Institutions of Higher Education

The barriers identified in this study that contribute to the CTE teacher shortage are complex. Responses from administrators and teachers identified a greater need for access to postsecondary institutions in an advisory capacity. High schools are seeking more collaboration with higher education, but the systems are fragmented, leaving them with limited access to build relationships (Chen & Ney, 2019). From their perspective, they

are feeling disconnected and are not benefiting from the current articulation streams available.

Some experts see these missed opportunities as a result of limited staff and faculty, thus perpetuating the problem. Access to teacher-professor collaborations is a strategy to facilitate these relationships with various academic departments that align with industry sectors, which can then positively impact support in creating articulation and support. These opportunities to collaborate can open doors to other possibilities to not only engage with students but also provide mentorship, peer collaboration, vertical curriculum collaboration and credibility; build a stronger reputation to boost CTE pathways' value; and cultivate more accessible student-friendly pipelines.

The fifth strategy would be to mobilize university support (via faculty and staff participation) for school-site advisory boards to provide guidance in curriculum and program development, as well as training for teachers. This is an excellent strategy to bridge teachers' curriculum needs by having educators from high schools and colleges come together to support and meet the demands for all students to be college and career ready. These collaborations can then lead to tighter articulation between community colleges and school sites, especially in the area of dual enrollment and the development of intentional pathways from high school to postsecondary institutions.

School districts vary in their needs, but there is some common ground: They all have needs specific to CTE teacher recruitment, teacher equity and pathway sustainability to meet their region's specific goals for students. Incorporating these strategies places a higher priority on working toward an inclusive approach that values all teachers' diverse backgrounds and that works toward an inclusive approach to foster collaboration. Teacher recruitment is costly, but reinvesting in active teachers is a viable approach that not only provides growth opportunities but focuses on teacher equity and retention. ■

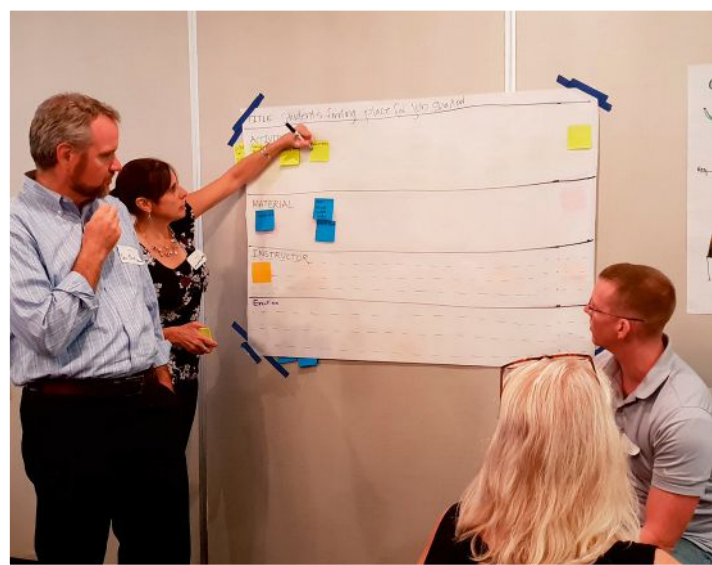
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# UDL Professional Development AND CTE Educators

By Amanda Bastoni





## **T**he Problem: What Kind of Professional Development (PD) Do CTE Educators Need?

When students are engaged, they are less likely to be disruptive. In 2008, researcher John Hattie conducted a massive meta-analysis looking at the impact of a variety of factors to determine how they affect student learning. He found that decreasing disruptive classroom behaviors had a larger positive impact on learning than homework, reducing class size or even the personality/ability of the school principal. It's a cycle. Engagement leads to less disruption, which in turn leads to more engagement and ultimately more learning. In other words, classroom management matters.

The same is true in career and technical education (CTE) classrooms — where teachers are passionate, knowledgeable subject masters and where the learning is generally more hands-on and relevant. When students are disengaged, teachers want to avoid simplistic discipline tactics like detention, but they also know just having interesting content isn't enough.

Developing tactics and strategies to increase engagement and decrease disruption is a complex issue, especially for CTE teachers, the majority of whom have taken alternative routes into the teaching profession. Though many CTE teachers have not studied education strategies per se, that doesn't mean they aren't fantastic teachers; however, it does mean they don't have many of the same pedagogical strategies as traditionally trained educators. CTE educators report feeling “less well-prepared in terms of pedagogy than those who have completed traditional certification programs” (Ruhland & Bremer, 2002).

Barney Keenan, former director of Granite State College in New Hampshire, is an expert on adult learning and has helped develop alternative certification plans for

hundreds of CTE teachers. Keenan points out that while CTE teachers enter the classroom with a range of experiences and skill sets, they are not necessarily experts on learning. Keenan suggests that professional development for CTE educators should be designed to bridge the gap between the experiences CTE teachers have had with learning — acquiring new skills on the job — and the place their students are at in the classroom. For example, he points out that CTE teachers may not have experience working with people who speak another language or have a disability, but in a public school setting, they will need to create meaningful challenges that engage all learners.

James Mitschmyer started teaching technical education at the Nashua Technology Center North Campus two years ago. Like many CTE educators, he has relevant work experience and some experience teaching adults, but his own education did not include any courses on curriculum design or strategies for teaching high school students with varying abilities and needs. Mitschmyer knows there are students in his classroom who have barriers to understanding the materials he is trying to teach, causing them to disengage or act out, but he isn't totally sure what to do.

“I really enjoy teaching, and I feel comfortable with my subject,” said Mitschmyer. “But I wasn't well prepared for the variety of needs my students would have. For example, in Nashua, we have a large population of English (ELL). As a new teacher, I had so many questions: What are some strategies that would help me safely teach these students to learn to solder? Or wire a light switch? How do I make my classroom engaging for students who might not be able to understand everything I am saying?”

Mitschmyer expresses what so many CTE teachers and administrators would like to see: professional development that

provides general strategies they can use to increase understanding for all students.

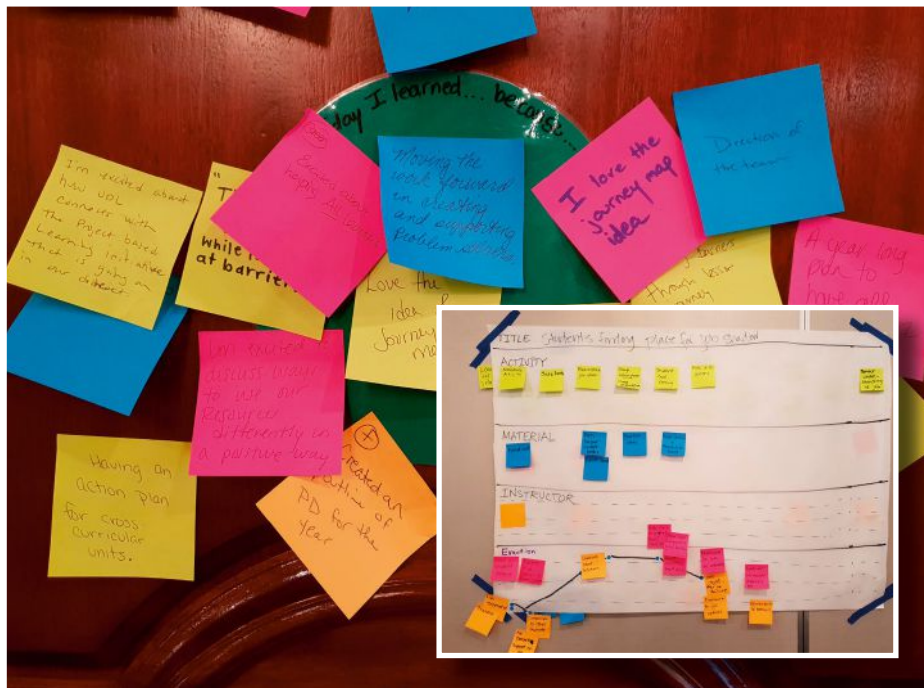
## **One Solution: Universal Design for Learning**

Many professional learning strategies are based on a management-consultant approach, which relies on a visiting expert to create large-scale, systemwide, and oftentimes, cookie-cutter solutions. In many cases, this approach does not take into account the particular circumstances or needs of a given school or student, does not leave room for teacher autonomy, and typically the changes do not last.

Universal Design for Learning (UDL), by contrast, starts by acknowledging variability; in fact, it is based first and foremost on the assumption that each learner brings their own strengths, needs and interests into the classroom. While most PD focuses on a single way to implement a new curriculum or manage behavior, UDL provides a framework to design curriculum and learning environments that help *every* student gain knowledge, skills and enthusiasm for learning.

Rooted in the learning sciences, including neuropsychology, human development and educational research, UDL is an internationally recognized tool for designing and implementing inclusive learning environments, says Jennifer Levine, director of professional learning at CAST, the nonprofit education organization that developed the framework. “We know — because neuroscience shows us — that no two human brains are the same. We know that all students learn differently. What I love about UDL is that it embraces this diversity and makes our variability a positive. It gives teachers a framework to use in *their* classrooms, in the ways that fit *their* needs and the needs of *their* students,” says Levine.

Two years ago, the New Hampshire Department of Education (NHDOE) set a goal of empowering all learners. To do



that, Frank Edelblut, commissioner of education, said the state needed to make sure teachers had the right tools. “UDL is about the students, of course, but we can’t really ask the teachers to support work they may not have been equipped to do,” said Edelblut.

So, working in conjunction with a team from CAST, Edelblut and the NHDOE set a big goal: bring UDL to every school in the state. The New Hampshire UDL Innovation Network is a multiyear ongoing PD initiative that offers UDL training and support to cohorts of teachers and administrators from any school in the state. So far, nearly 600 teachers and/or administrators from 65 different schools have participated in the training.

Edelblut attributes breaking down the silos in education as a major benefit of the statewide initiative. “We wanted to use UDL PD to break down those barriers and build a shared statewide value system,” said Edelblut. “This training gives us a way to talk about education that is not simply a ‘one and done’ Band-Aid. By including all schools and educators, we make UDL part of the statewide conversation forever with shared educational goals and values.”

CAST’s Jennifer Levine agrees that the statewide PD has helped unify teachers in their goals and purpose: “Designing through the UDL lens has really empowered them as educators and professionals and that it has given them a framework for being successful with students they may have struggled to reach in the past.”

### UDL and CTE Educators: Success for All Students

Mitschmyer voluntarily signed up to be part of the cohort of educators from Nashua High School North (NHSN) participating in the statewide UDL PD because he wanted to learn strategies he could use to ensure all students had access to the material and were engaged. Mitschmyer said one of his favorite things about UDL is that it is “not a reactionary measure.”

One major change Mitschmyer has made to his teaching, since participating in the UDL PD has been to focus more on the goals of the lesson. In UDL, the first focus is design, he said. When looking at lessons, teachers in UDL PD revisit important questions, such as “What do I want students to learn? Why do I want them to learn it? How will I know they have learned it?”

“I could still assign students to read a chapter and write a paper, but I need to remember that the goal in my class is not for students to practice their reading comprehension or writing skills, it’s to help them understand electricity,” said Mitschmyer. “But when designing using UDL, I would also add another option.”

For a recent electricity unit, Mitschmyer told students they could take appropriate measurements using a multimeter and then record their findings and investigation in any way they wanted. “For these students, I would then give an oral summative evaluation. Building choice into a lesson fosters students’ autonomy and builds in flexibility for various learning styles, and in the end, it means more students will be successful.”

Kori Kennedy, facilitator for the UDL cohort at NHSN, has also used the UDL PD to rethink how she designs assessments. By designing “to the edges,” she has made learning more accessible for all of her students. For example, she recently had a student fail a quiz. “I originally thought the quiz was fairly straightforward, but the work I’d been doing with UDL forced me to view this assessment more objectively,” she said. “What if I added visuals to assist student understanding? What if I broke down the information into smaller pieces? What if instead of trying to change how this student learns, I changed how I assess what he knows?” Kennedy made adjustments to the quiz, and moving forward, plans to use the new version for all of her students.

Jason Smith, CTE teacher at NHSN and a member of the UDL cohort, spent more than 30 years in the automotive industry. During his first year of teaching, Smith taught theory the way he had learned it: in the classroom with students sitting in desks in rows. “I only took students in to the shop to work on the actual cars and related components,” Smith said. Then, Smith attended his first UDL training.

“I get asked every day if we are going to go into the shop,” he said. “When I say no, I get a lot of groans and eye rolling. It’s where the students want to be. So, after learning the principles in UDL, I made a change. I decided to take a portion of the



classroom training and move it into the shop. I asked students if they would rather do classroom work in the shop, and they all enthusiastically agreed. After trying the method, I found the students were more engaged and actually were looking forward to learning more.”

Levine sees UDL as a PD solution that fits the needs of CTE educators because it provides a customizable framework teachers can use to address the needs of special populations, such as students with disabilities and English language learners (ELL). “By designing CTE courses through the UDL lens, you ensure that not only does every student learn but that they learn in a way that is best for them and they learn in a way that values who they are.”

Overall, CTE teachers participating in the UDL statewide PD say they appreciate the strategies the framework provides, while still empowering the teacher. “It’s not a constrictive approach,” said Mitschmyer. “It’s flexible, and by using goal-focused strategies in my lessons, my ELL students have a pathway to greater success. They are more engaged and less likely to be disruptive because they can access the learning.” ■

**Amanda Bastoni, Ed.D.**, is an educational research scientist at CAST, an educational nonprofit dedicated to removing barriers to learning. Before working at CAST, she was an accomplished career and technical education (CTE) director and teacher with 20+ years of experience in K-12 educational leadership, journalism, and business. She has a proven record of achievement, including being named the 2019 NH CTE Leader of the Year. She helped start innovative crossdisciplinary programs, including Robot Algebra, a course that combines math and technology, and Drones in Technology, a course that combines art and technology. Her email is [abastoni@cast.org](mailto:abastoni@cast.org).

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## Connect with CAST

As a former CTE teacher and program director, I am passionate about professional development for CTE educators because I know what it is like to come from industry into the classroom almost overnight. I also know how important CTE educators and programs are for kids.

I am passionate about equity. Which students don’t have access to CTE? And, why? I support UDL professional development for CTE educators because it’s not another new gimmick. Instead, UDL is a research-based framework that helps teachers create supportive and inclusive environments. UDL is useful. It makes sense. It works.

And, because it is endorsed by all major federal policy governing K-12 and higher education, including the Strengthening Career and Technical Education for the 21st Century Act (Perkins V), UDL can help open the door to funding.

Perkins V mandates that programs and states spend funds to recruit and train CTE educators and remove barriers for special population students. UDL can become the vehicle to do this. By using UDL techniques, CTE educators can remove barriers and increase access for *all* students, including learners with disabilities, students from low-income communities, English language learners, and female students.

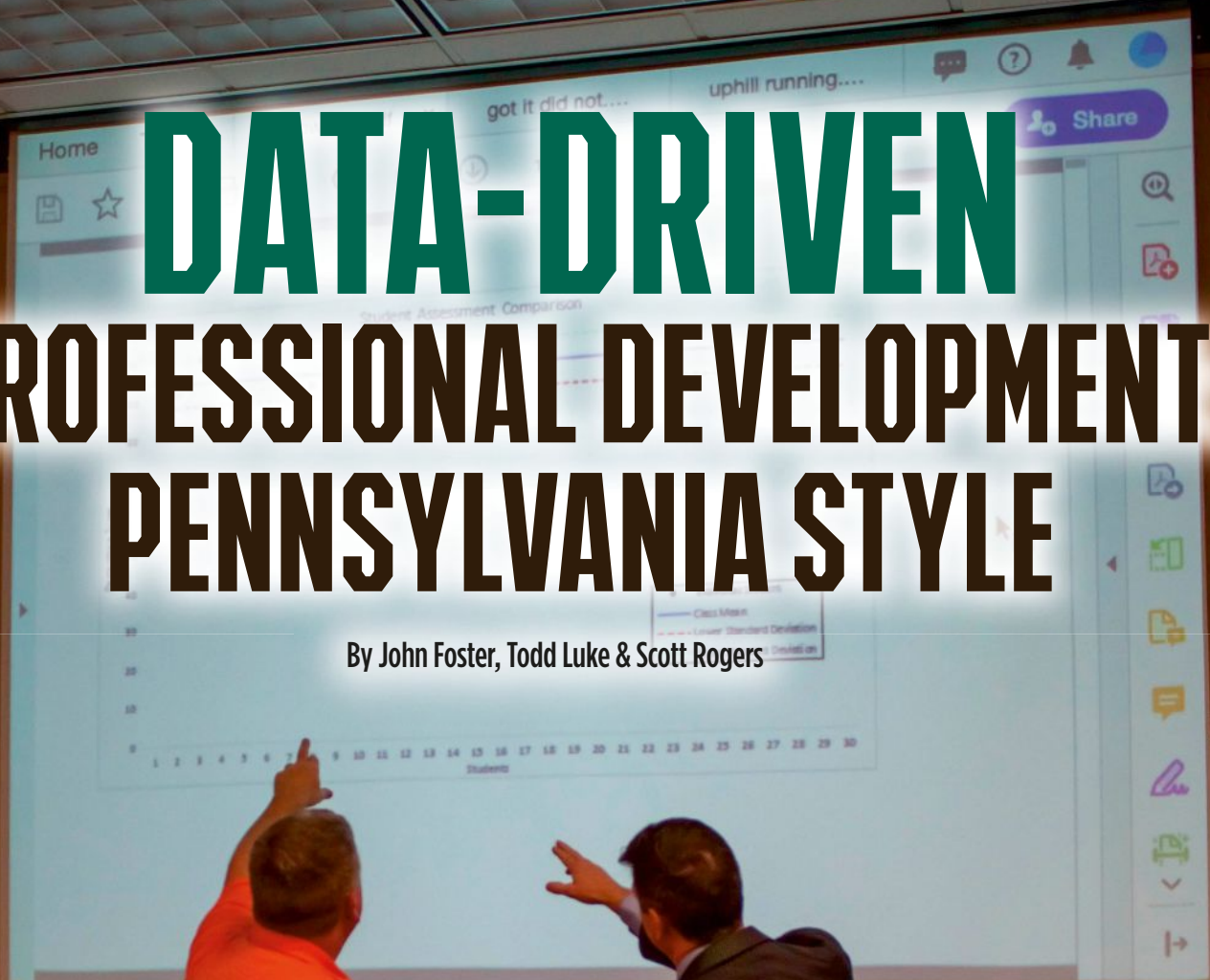
Today, I am thrilled to be working for CAST (see [cast.org](http://cast.org) for more information), the research organization that created UDL. I have the opportunity to work with schools across the country to develop programs, classes, technology, professional development, and policies that are innovative and inclusive. I would be happy to answer any questions about UDL and professional development or about funding/designing learning environments that eliminate barriers.





# DATA-DRIVEN PROFESSIONAL DEVELOPMENT: PENNSYLVANIA STYLE

By John Foster, Todd Luke & Scott Rogers





## The Commonwealth Connection

It's common knowledge that the Declaration of Independence and the United States Constitution were signed in Philadelphia, Pennsylvania. Educators may even know that Pennsylvania is home to one of the original Land Grant colleges: Pennsylvania State University (PSU). These two historical benchmarks, among others, may seem a bit disconnected to the title of this article, but the reality is that there is a strong spirit of collaboration and a dedication to improvement that exists in the state, as well as a long history of support for career and technical education (CTE). The state's support and implementation of CTE initially dates back to the 1800s but really solidified during the Vocational Education Acts of the 1960s (Office of Education, 1965), when 80 regional centers were established across 67 counties. Once established, these centers and approximately 200 high school-based programs began the process of recruiting, training and retaining industry experts to work in each of these facilities. Today's CTE administrators know training and retaining have a lot to do with professional development — whether it is preservice or in-service training.

Pennsylvania has a long-standing history in the development of workforce-education professionals with three distinct Professional Personnel Development Centers (PPDCs) geographically positioned to support the needs of the state. On the western side of Pennsylvania, Indiana University of Pennsylvania (IUP), serves as the center that supports development and certification of workforce-education professionals. PSU serves the center region of the state, and Temple University supports the eastern region. All three centers receive funding from the Department of Education to support placement of properly certified instructors in CTE centers within the state. The three centers provide a path toward certification that utilize college-level courses and field-resource personnel to support local visits to career centers and programs in Pennsylvania, supporting new workforce-education professionals (Penn State, College of Education, 2019).

The support doesn't stop with these centers; the Pennsylvania Department of Education established a technical assistance program (TAP) that includes the Career and Technical Distinguished School Leaders (CTDSLs), MAX Teaching, Southern Regional Education Board (SREB), and National Occupational Competency Testing Institute (NOCTI) to establish a long-term statewide longitudinal data source of technical competence.

This system is enhanced by coordination with the Pennsylvania Association of Career and Technical Administrators (PACTA). These CTDSLs were hand selected and included recently retired CTE administrators who had been innovators in some phase of CTE. Expertise in budgeting, developing curriculum and new programs, building schools, procuring equipment, offering adult education, and supporting professional development were just a few of the specialties these individuals demonstrated throughout their careers. In addition, the state legislature made this innovative program a permanent part of the state funds with full bipartisan support.

So what does all of this have to do with data and professional development? Essentially, the state of Pennsylvania believes in measuring what matters. For well over a quarter century, the state has utilized nationally validated third-party industry standards and credentials to evaluate the progress of its programs, the success of its students, and the overall impact on the workforce.

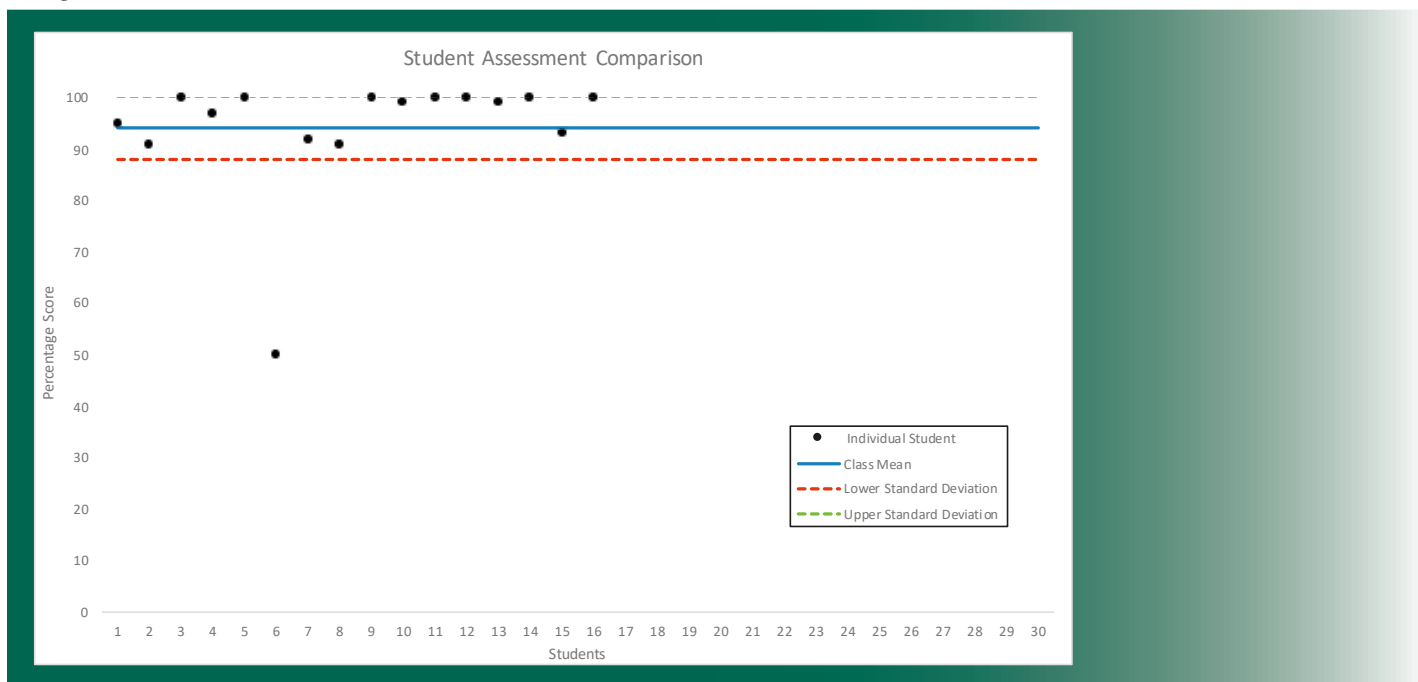
Data provided from this model have another purpose, too: Through data-analysis techniques, patterns emerge that identify professional development needs—needs that are customized to the individual, directly aligned to professional growth, reflective in nature, tied to objective data and ongoing. These factors are all in perfect alignment with the tenets of the Strengthening Career and Technical Education Act for the 21st Century (Perkins V).

## Data Tells a Story: An Analogy

Some people strongly dislike the idea of data. The mere mention of the word can be enough to make a person run for the hills. This emotional response is not usually focused on the data but more on the presentation of the data. When a person cannot relate to the concepts or vocabulary involved in any process, the brain downshifts to a level where the person is not truly comprehending. In addition, being unable to relate creates a lack of motivation, which leads to a spiraling lack of understanding. Hearing conversations involving mean, mode, median, effect size and Cohen's *d* can actually disengage individuals from the conversation.

There are many articles, books (Hattie, 2009) and print publications related to data and storytelling, but sometimes a great story can be derived from nothing more than simply living life. In the 1670s, Isaac Newton said, "Truth is ever to be found in simplicity," and this is where we will begin our story.

Figure 1.



When individuals are asked to describe what they are looking at in Figure 1, the most common answer is “dots and three lines.” Although this answer is true, it is not the complete story behind the picture. This picture might actually represent a current view of student assessment data.

Imagine for a moment that the students in the classroom represented on the graph are involved in running a race. The race begins at the starting line with a percentage score of zero, and the race finishes at the percentage score of 100. As students are running, their teacher flies high above the race in a blimp to oversee all the “runners.” The altitude at which that blimp flies is somewhere between 1,000 and 1,500 feet so that it is clearly visible to the people below. While flying at this altitude, the teacher watches the students run the race. In desperation to know how the students are doing, the teacher leans over the edge of the blimp and snaps a picture that includes all of the runners. At that altitude, students appear as small dots, with the dots representing the top of each student’s head.

As with any good sporting event today, tracer lines are superimposed on the screen so that people can better understand and follow the event. In football, for example, there is the blue line that denotes the line of scrimmage. A yellow line designates the distance to achieve a first down. The purple line usually means that the team is within field-goal range. In other words, the lines define progress toward an outcome.

Now reexamine Figure 1. The lines that are superimposed over the student race have similar significance. The blue line denotes the best linear, unbiased estimate as to who might be able to win the race. This line also represents the class mean score or class average. How many runners or students are close to the class mean or class average? How many runners are ahead of the average? How many runners are behind and how far behind are they? These are all reflective questions to ask when examining Figure 1.

When looking at the scores within any assessment, a standard deviation can be calculated. Merriam-Webster (2019) defines the standard deviation as “a measure of the dispersion of a frequency distribution that is the square root of the arithmetic mean of the squares of the deviation of each of the class frequencies from the arithmetic mean of the frequency distribution.”

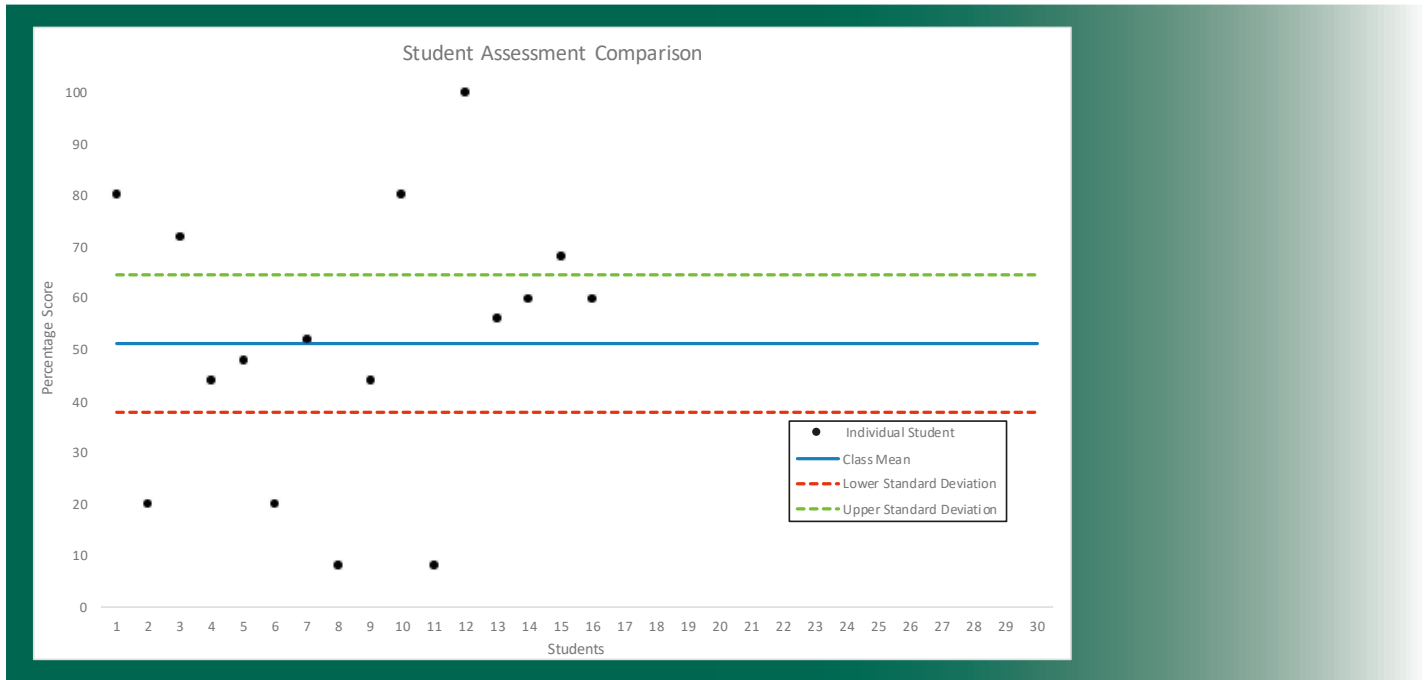
In *Statistics for Dummies, 2nd ed.* (Rumsey, 2016), the definition of standard deviation is stated as the following: “The **standard deviation** is a measurement statisticians use for the amount of variability (or spread) among the numbers in a data set. As the term implies, a standard deviation is a standard (or typical) amount of deviation (or distance) from the average (or mean, as statisticians like to call it).”

In Figure 1, a standard deviation was calculated based on the input of scores from the assessment. Two superimposed dashed lines were created for the race based on the standard deviation calculations. The standard deviation was divided and superimposed above and below the mean, or blue line. The green dashed line represents the upper deviation, and the red line denotes the lower deviation.

As Figure 1 shows, the mean (blue line) is approximately 95 percent, which means the class average of all scores was 95 percent on the assessment. All the runners are very close or within the deviation lines except runner number six. That runner is below the red line. Any runner below the red line cannot win the race. How many runners can be or should be left behind in classroom assessments? Understanding the data through a story helps make its application practical. In Figure 1, in keeping with the race analogy, if one examines all of the students and notices how well virtually everyone scored on that assessment, a conclusion may be made that the lesson was easy to teach and/or to learn. In other words, runners are involved in a race that allows for coasting downhill.



Figure 2.



In Figure 2, the blue line (the mean score) is just above 50 percent. In other words, on average, the students know about half of what was assessed. Think of Figure 1 as coasting downhill, and Figure 2, the exact opposite: running uphill. Again, any runner below the red line could not have won that lap of the race. There are four runners below the red line. There are five runners above the green line. Consider the students that scored above 80 percent (three in Figure 2) to have been conditioned to run uphill, while the others do not have that ability. The choice seems simple: Turn around and go back down the hill (reteach the material a different way) or accept the fact that on average, the runners will only make it halfway through the race. The variance in these scores is very high. If these were the first two assessments in a classroom, it would be easy to determine that runner number six would not have a chance to win.

Consider each assessment, whether formative or summative, a lap of a race from the beginning of a marking period or year to the end of a marking period or a year. Analyzing the data with each assessment allows for continual monitoring of the race from a position that includes all students' performance.



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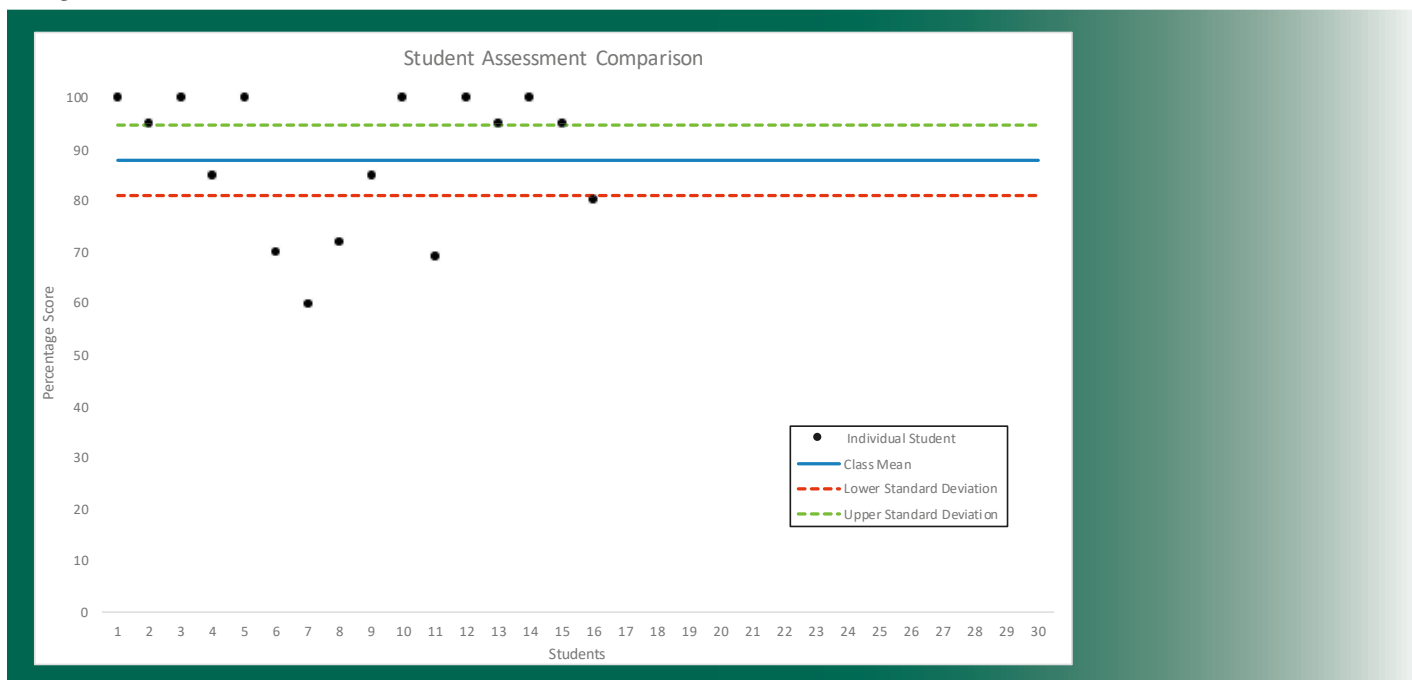
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OF OUR WORK

Figure 3



In Figure 3, notice the blue line at approximately 90 percent mean. Five runners cannot win this lap when compared to the other runners because they are below the red line. Although some might argue that those five did not score below a 60%, teachers need to realize that checking for understanding and formative assessment, when executed properly in a classroom setting, will allow for more runners to be within the deviation lines. Students will not all receive the same score, but they will run at a pace within the range established by the deviation. Nevertheless, a teacher doing everything right does not ensure that every runner will be successful in every lap of the race. There are nine runners above the green line. These nine clearly outran the rest of the class. Notice that there are only two students within the deviation lines. In other words, two runners are within the calculated deviation from the mean of the whole class. In this race, students can either run or they can't — in other words, they either get it or they don't.

When there is a group of students lagging behind, this might be a good time to visit the idea of formative assessment and the impact that it has on improving classroom achievement. Are there ways to get more runners within the deviation lines? These are not fictitious scores or graphs but are from a real classroom with a real teacher and real students. This entire process was not designed to evaluate and judge anyone as a teacher. It was designed as a reflective activity so teachers can evaluate the impact they are having on their students and how well the races are going.

This kind of analysis of data is just one tool in the Pennsylvania arsenal that can be used to enhance reflective customized professional development.

## Professional Development on a Large Scale

In order to be successful, a professional development system needs to meet the needs of its constituents and must be based on objective data. Ultimately, that data needs to be analyzed to reveal patterns and establish benchmarks. Data analysis provided at the local level can be incorporated into a database that can be utilized for replication of success across the region or across a state. The idea is to put all the data together and develop a mining process that is capable of disaggregating the data in a way that all schools can benefit from it. If one school has an area where they have challenges, they can utilize a database to locate other schools that excel in that area. This creates a professional data network, allowing teachers to collaborate in regard to curriculum, instruction and projects, that focuses on replication of success.

## A Commonwealth Example

Using data in action can be seen at York County School of Technology (YCST), located approximately 30 miles south of Harrisburg, Pennsylvania. YCST is one of 16 comprehensive career centers in Pennsylvania with 25 programs of study being delivered to approximately 1,700 students in grades nine through 12. The school is supported by 14 member school districts in York County. YCST has implemented and executed a continuous improvement model utilizing data in which instructors create an annual improvement plan based on the data from technical skill assessments. Instructors examine data for trends that are aligned to an occupational standard on a national credential, like blueprint reading in carpentry on the NOCTI. The instructors then work to develop curriculum and instructional strategies to address challenges within those standards to improve student achievement. In Pennsylvania, Act 82, Building Level Scores (BLS), formerly



known as the School Performance Profile (SPP), was changed in 2018 to align with the new federal Every Student Succeeds Act. A school BLS is calculated at the state level utilizing multiple indicators, with one indicator measuring success on the NOCTI Workforce Competency Credential. Before implementing this model 10 years ago, YCST's SPP was in the mid-60 range. After implementation of the data analysis improvement model in 2010, YCST now has a BLS score of nearly 90 and ranks first among all comprehensive regional CTE sites in Pennsylvania. In addition, YCST has elevated its NOCTI written and performance scores from 64% in 2009 at the competent or advanced level to 93% in 2019, achieving the competent or advanced level. YCST has taken the lead in an effort to strengthen their region by establishing a professional learning network referred to as TechLink ([www.techlinkpa.com](http://www.techlinkpa.com)). TechLink consists of schools located within the region and promotes collegiality among CTE professionals in an effort to improve CTE performance and achievement within the region. TechLink meets on unified in-service days throughout the year, compares local data and collaborates to determine areas where they can work together to improve student achievement. In addition to CTE, YCST recently hosted several Keystone Summits with member district teachers in the region to improve the Pennsylvania Keystone assessments in the core academic subject areas. This effort brought core subject teachers together to collegially determine strengths and challenges on the Keystone assessment and develop action plans to improve within the 15-school region.

Teachers need to be able to understand the data and then be allowed to learn from each other in collaboration, not competition. Furthermore, this effort is not based on evaluation and judgment but rather on diagnostic and prescriptive methods to help students achieve. ■

For more information on how you can create graphs, establish a PLN, or use data for continuous improvement, email [srogers@ytech.edu](mailto:srogers@ytech.edu), [todd@maxteaching.com](mailto:todd@maxteaching.com), or [john.foster@nocti.org](mailto:john.foster@nocti.org).

**John Foster** is president/CEO of NOCTI and Nocti Business Solutions and has almost 45 years of CTE experience. He believes in the good things that CTE does for individuals, employers and our standard of living.

**Todd Luke** is president of MAX Teaching, Inc. a position that allows him to share his passion for the art and science of teaching. His 35 years in CTE include service as a teacher, administrator and board member.

**Scott Rogers** is the assistant administrative director at York County School of Technology and is a 2019 ACTE National Leadership Fellow. His passion for CTE has earned him several national awards over the past few years.

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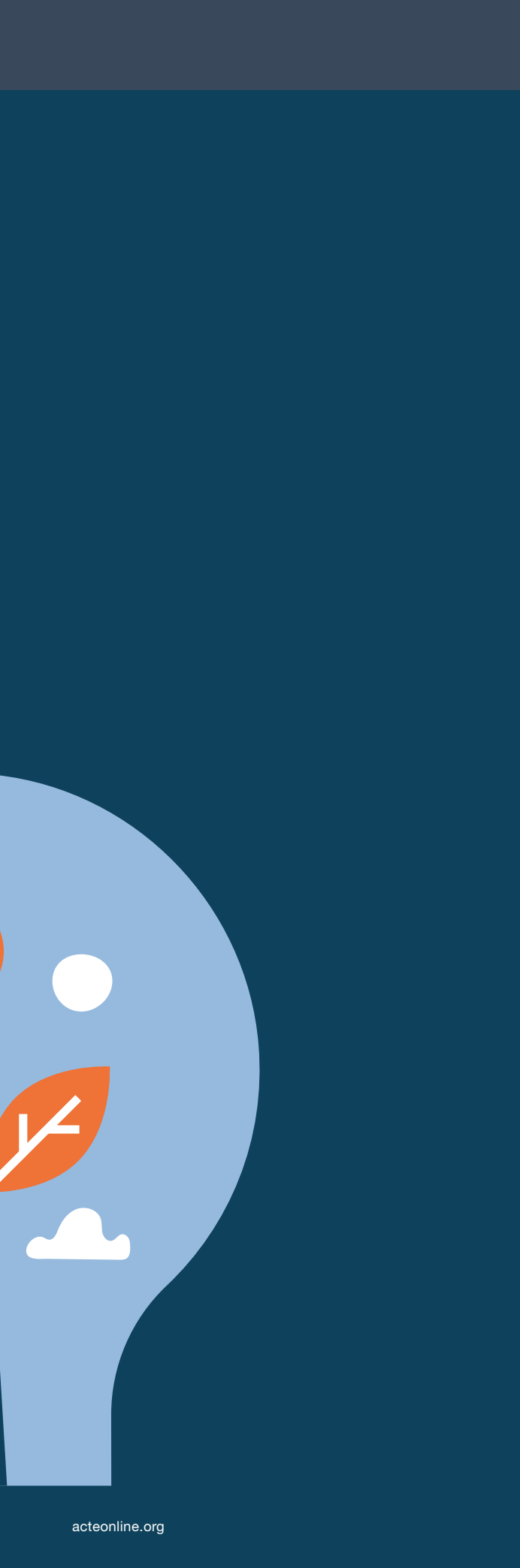


# Enhancing Self-efficacy for Teaching and Retention:

## The Need for a Career and Technical Education Teacher Mentorship Program

By Dawn Mallette, Katy Blatnick-Gagné,  
Karen Alexander, Jeffrey Fletcher & Mathew Baker





**N**ationwide, the teaching profession is witnessing a severe and very concerning teacher shortage. Sutcher, Darling-Hammond and Carver-Thomas (2016) estimated a shortage of more than 110,000 teachers during the 2017–2018 school year with the shortfall projected to remain at those levels for years to come. A high level of attrition of classroom teachers (8% annually) and the reduction of enrollments in teacher education programs (35% from 2009 to 2014) account for a large part of the deficit (Sutcher, et al., 2016).

Exploring ways to increase the number of those entering the profession and how to reduce the number of teachers leaving the profession are significant to the strength of the teaching profession.

The role of a teacher is complex and multifaceted. Teachers are presented with the weighty responsibility to prepare all students who enter their classrooms with the knowledge, skills and dispositions to become productive members of society and good citizens in our democracy. To achieve this lofty goal, educators need to teach more than knowledge and skills related to their content area. Additionally, teachers are tasked with adapting their teaching to the individual needs of diverse students, motivating students, providing a safe and well-managed classroom, cooperating with colleagues and parents, and coping with changes and challenges (Skaalvik, 2010).

Even with its complexities, the teaching profession is seeing a growing population of novice teachers. Rebora (2019) stated that the number of novice teachers in the United States is rising in dramatic fashion. Dr. Richard Ingersoll and colleagues at the University of Pennsylvania found that the most common number of years of experience for a U.S. teacher in 2016 was 0-3 years, down from 5 years in 2012 and 15 years in 1988 (as cited in Rebora, 2019). Whether they enter from a teacher-education program or some alternative licensing route, novice teachers make up a large proportion of educators in the United States. These educators are integral to student success, no matter how inexperienced they may be (Rebora, 2019) and that responsibility can be incredibly overwhelming for newer teachers. The Carnegie Foundation for the Advancement of Teaching designated the beginning years of teaching as the "make or break" stage (Carr, Holmes, & Flynn, 2017). Sutcher et al. (2016) stated, "Teachers with little preparation tend to leave at rates two to three times as high as those who have had a comprehensive preparation before they enter." Providing mentoring and assimilation of all teachers into schools and education systems has the potential to affect the overall success and retention of enthusiastic new educators.

### The State of CTE Teachers

With the economy improving and limited funding for recruitment and retention programs, the shortage of career and technical education (CTE) teachers is increasing.

The lack of trained CTE teachers results in either the closure of programs or the hiring of individuals who lack the appropriate training to successfully influence students' college and career readiness



(National Association of State Directors of Career and Technical Education, 2010). CTE programs have a direct impact on the workforce, making the retention of teachers and programs imperative.

Additional classroom responsibilities add to the complexity of a career and technical teacher's job. Obligations, such as advising student organizations, traveling with students, data reporting for federal funding, organizing and managing lab settings, and creating work-based learning opportunities for students, are all unique aspects of the CTE classroom and the CTE teacher's duties. Many novice CTE educators are underprepared for these additional responsibilities.

### Self-efficacy of Novice Teachers

*For most teachers who leave the teaching profession voluntarily, some type of dissatisfaction influenced their decision (Sutcher, et al., 2016).*

Additionally, the lack of professional learning opportunities, instructional leadership, and time for collaboration and planning were all factors contributing to dissatisfaction. As a result, teachers who feel ineffective or unsupported in the early years can abandon teaching (Kutsyuruba & Walker, 2015).

Poor job satisfaction likely influences one's self-efficacy, which is the belief in one's abilities to accomplish desired outcomes. Bandura's theory says teachers' self-efficacy beliefs are related to the effort they invest in teaching, the goals they set, their persistence when things do not go smoothly, and their resilience in the face of setbacks (Tschannen-Moran & McMaster, 2009). One indirect cause of the teacher shortage, or teacher attrition, may be the classroom teachers' low self-efficacy.

Because their jobs are multilayered, new teachers can expend great energy and still fall short in accomplishing everything their job asks of them. Efficacy expectations determine how much effort people will expend and how long they will persist in the face of obstacles (Bandura, 1977). The stronger the perceived self-efficacy, the more active the efforts, the higher the satisfaction, and as a result, the better likelihood of continuing in the teaching profession.

### Mentorship Programming for CTE Teachers

Rebora (2019) argues that novice teachers may need more assistance than their veteran colleagues and administrators are able to provide because of the lack of supports (e.g., time and financial) for the mentorship of new professionals. Blatnick-Gagné, Alexander, and Mallette (2019) conducted a feasibility study to examine current practices in teacher mentorship programming of CTE, specifically Family and Consumer Sciences (FCS) teachers. Data elements and variables were analyzed to investigate the need for a national CTE mentorship program.

Family and Consumer Sciences teachers (N=363) from across the U.S. participated in an online survey. Of the 363 respondents, 96% were females between the ages of 45 and 64. The majority of respondents attained their initial teaching certificate/license by completing either a four-year teacher-preparation program (70%) or a post-baccalaureate teacher preparation program (12%). Over half (52%) of the responses came from high school FCS teachers. When asked about one or more years of related business and industry experience prior to accepting a teaching position, the participants were fairly evenly split, with no prior business and industry work experience representing 49.9% and one to two years of prior work experience representing 50.1%. Finally, when asked about their participation in various CTE-related extracurricular activities while in middle/high school, only 18% of the FCS teachers identified having participated in Future Homemakers of America (FHA) or Family, Career and Community Leaders of America (FCCLA) with the next highest participation being in 4-H (9.4%). Sixty-three percent indicated no participation in FCCLA while in middle school or high school. The data collected reveals that, although most teachers were prepared in a four-year or post-baccalaureate FCS teacher preparation program, they lacked experience working with FCCLA, the FCS-related career and technical student organization (CTSO). As a result, the majority of the survey participants lacked the CTE knowledge and skills that may be enhanced through participation in a CTSO in middle or high school.

The feasibility study (Blatnick-Gagné, et al., 2019) investigated participation in a men-

torship program, as well as their support for a nationwide CTE mentorship program. Results revealed a meager 13.5% of the 363 study participants indicating they participated in CTE mentorship opportunities, with 68% indicating that the mentorship program experience was poor. Only 8.3% of those who received CTE mentoring reported being assigned an FCS or other CTE educator as a mentor. These results could help explain the high "poor" rating of the mentorship experience. The majority of respondents (51.5%) identified as promoters of the idea of a nationwide CTE mentorship program, with only 17.1% indicating a negative viewpoint with regard to said program. (See Table 1 on page 31.) Collectively, 63.6% of the participants indicated that they would be *most likely* (15.7%) or *probably likely* (47.9%) to participate in a hybrid (webinar, online or face-to-face) CTE mentorship program.

Participants were also asked to determine the significance (0 = Least Important to their mentorship needs and 5 = Very Important to their mentorship needs) of a series of educational/CTE topics. Ten topics were identified as Important to Very Important for the professional development/mentorship of CTE/FCS professionals.

- The management, planning, and preparation for labs rated the highest (M=4.64).
- Managing an FCS/CTE teaching load (M=4.48), marketing their FCS/CTE program (M=4.08), and gaining training in specific models of teaching (discussions, problem-based learning, cooperative learning, skills teaching, etc.) (M=4.0) were rated as significantly important.
- Finally, working with special populations and fundraising in FCS/CTE programs were also deemed as important professional development topics.

#### Special populations variable

Mean = 3.91

SD = 1.12

#### Managing, planning, and preparing for labs

SD = 0.64

#### Managing an FCS/CTE teaching load

SD = 0.79

#### Specific models of teaching

SD = 1.03

According to *Focusing on the Essentials* (Schmoker, 2019), in order to significantly affect student learning, preservice and pro-



**Table 1. How significant is the need for a CTE specific mentorship program?**

Viewpoint	Frequency (#)	Percent (%)	Cumulative Percent (%)
<i>Detractor</i>	62	17.1	17.1
<i>NA</i>	15	4.1	21.2
<i>Passive</i>	99	27.3	48.5
<i>Promoter</i>	187	51.5	100.0
<i>Total</i>	363	100.0	

Promoter = Participant has a favorable view of CTE-specific mentorship programs for educators.  
 Passive = Participant has a neutral view of CTE-specific mentorship programs for educators.  
 NA = Participant did not answer question  
 Detractor = Participant has a negative view of CTE-specific mentorship programs for educators.

professional development must be committed to training teachers in best practices rather than the latest educational craze. Results validate and justify the creation of a CTE mentorship program for novice teachers, which utilizes best practices to improve knowledge and skills related to specific CTE topics. This mentorship program has the potential to increase teacher effectiveness and improve satisfaction and self-efficacy while improving teacher commitment and early career retention rates (Tschannen-Moran, Hoy, & Hoy, 1998; Cramer, 2004; Conneely & Uy, 2009; Duncan, Cannon, & Kitchel, 2013; Kutsyuruba & Walker, 2015).

“To actually have a mentorship program that is CTE focused would have been very helpful.”

“Teaching is not just about academics; teachers wear many hats. Mentoring should involve every aspect of those areas to provide new teachers knowledge and skills to become an effective teacher.”

“Having a mentorship program that requires more active engagement, work time, and a mentor in the same field of study/content or at least another CTE teacher would be more meaningful.”

— Statements from anonymous CTE teachers (Blatnick-Gagné, Alexander, and Mallette, 2019)

### What's Next?

With the increased national attention on FCS education, CTE programming and CTE teachers in general, now is an opportune time to focus on the mentorship of novice CTE teachers. Having a generation of confident and highly competent CTE educators is critical for the success of students enrolled in programs, the retention of quality teachers, and

the profession in general. Creating a national mentorship model for CTE may directly influence a teacher's choice to work in education as well as stay in the classroom longer.

*This research team is in the process of addressing the needs identified in this research through the development of a nationwide CTE mentorship program.* ■

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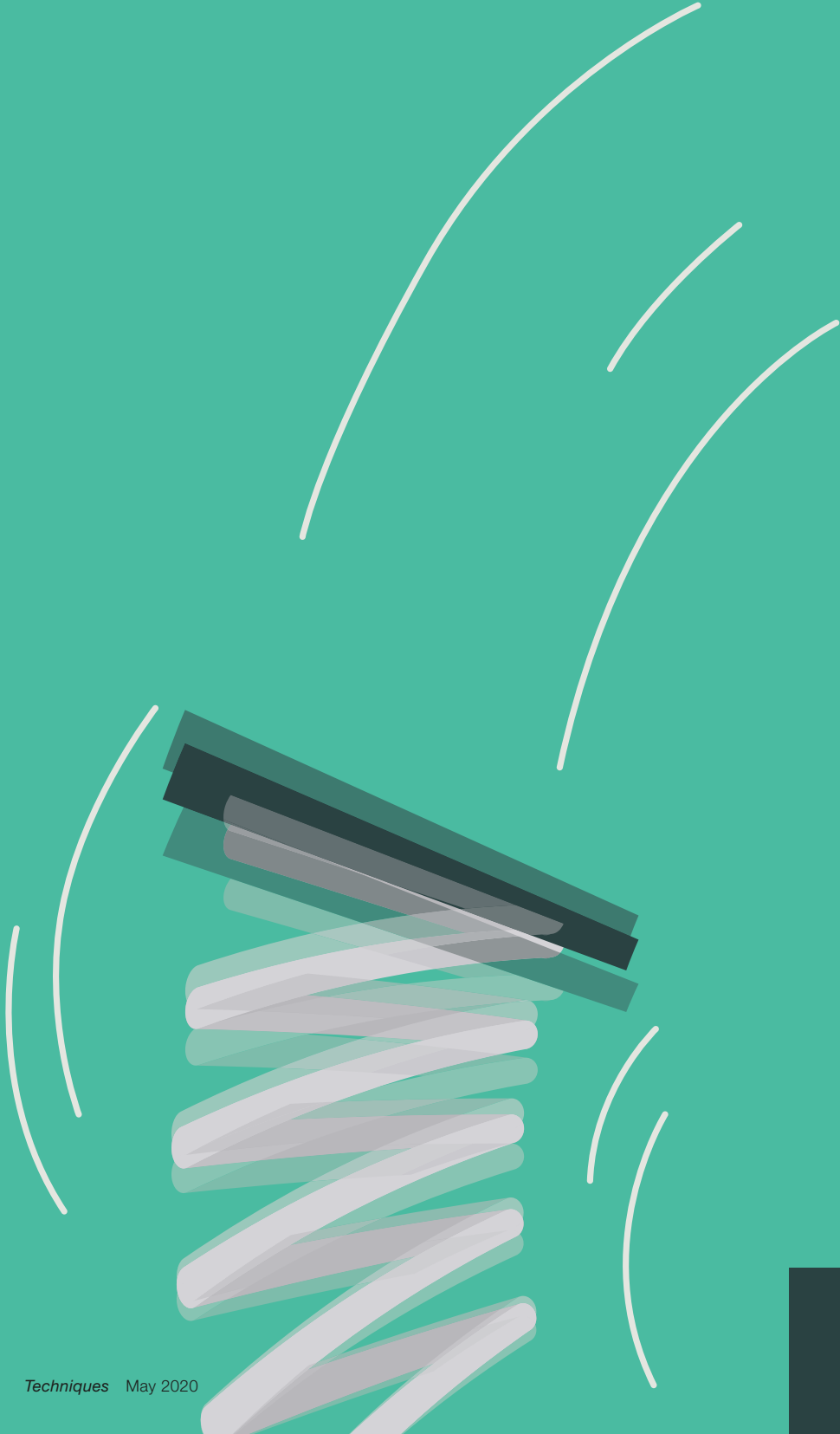
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# A Springboard into the High-quality CTE Program Framework

## Can the Curriculum for Agricultural Science Education Help Agriculture Teachers Create a High-quality CTE Program?

By Julie Fritsch

**S**ince ACTE published its *Quality CTE Program of Study Framework* in 2018, it's been easy to find CTE teachers and administrators who can agree that it makes a lot of sense. In fact, you would probably be hard-pressed to find a CTE teacher who is surprised by any of the 92 points listed in the framework.

The head scratcher, though, is being able to take what you're doing every day and match that up with those points — all while teaching a full course load, advising your career and technical student organization (CTSO), taking care of your program's specialized facilities, and trying not to spend 20 of your day's 24 hours at school. You know you need to get the attention of your administrators in a way that will show them that what you're doing is essential to their goals for student achievement ... it's just finding the time to do that.

That's where the Curriculum of Agricultural Science Education (CASE) has been helping agriscience teachers like Josh and Randi Krieg, who teach at Goldendale High School and Goldendale Middle School in Goldendale, Washington.

The Krieges are certified in nine of the 10 yearlong courses CASE offers. As a result of events in their state — Washington has adopted Next Generation Science Standards, and every school district in the

state is required to offer at least one core class that is a CTE course — the Krieges and other agriculture teachers in Washington see CASE as a great tool to help them build high-quality CTE programs. They are using CASE courses to provide agriscience classes that count for science credit. This has transformed their programs from nice-to-have to need-to-have for the schools where they teach.

Currently, the Krieges comprise two-thirds of their school's science department. They teach all of Goldendale's ninth grade science courses and offer a CASE course for each science requirement through graduation. That means if a Goldendale student wants all of their science courses during high school to be agriculture-focused, they can be.

Because Randi also teaches at the middle school (science, but not CASE), the Krieges have the opportunity to see a student's growth over a six-year period.

"It's really cool to see that we're able to have six years of influence on these kids," said Randi.

What the Krieges are doing through CASE appears to be working for Goldendale students.

"We just got back our results from the state science test," said Josh. "We're 34% above the state average."

But is CASE really responsible for the Krieges' success? It's true that the Krieges would likely be good agriscience teachers even without CASE.



## A Springboard into the High-quality CTE Program Framework

Can the Curriculum for Agricultural Science Education Help Agriculture Teachers Create a High-quality CTE Program?

“At first I was resistant to the idea of CASE because I had already developed my own science curriculum,” said Randi.

CASE’s ability to bring together all the elements needed for a high-quality CTE program and deliver it in a prepackaged way relieves the burden for good teachers to constantly come up with ways to prove the worth of their programs.

The *Quality CTE Program of Study Framework* has 12 elements. Either directly or indirectly, CASE helps teachers address each one.

### Following the Money: How CASE Helped Washington Teachers Find Funding for Their Programs

Agriculture teachers like the Kriegs are adept at seeking out grants to help offset the cost of the facilities and equipment required to teach hands-on, inquiry-based courses like theirs. However, in Washington, the value of CASE-certified programs as shown through student achievement, coupled with agricultural education’s traditionally strong partnership building, has led to funding that teachers in other states only dream about.

Jesse Taylor, the executive director of the Washington FFA Foundation, worked with the Washington state legislature during their 2017–2018 session to secure \$1.75 million in funding for capital equipment grants for CASE-certified teachers. The legislature approved a second \$1.75 million for the same purpose again last year.

Overall, this legislation has allowed the Washington FFA Foundation to issue more than \$3 million in grants to CASE-certified educators in Washington during the last two sessions. These grants, which average about \$30,000 each, have the ability to completely transform a school’s agriscience program.

Only CASE-certified teachers are eligible to receive the grants, and all grant

money must be spent on capital equipment — something with a 15-year or longer life span, said Taylor. Among other things, agriscience teachers are using these grants to outfit science labs, purchase technology like welding simulators or drones, and construct teaching greenhouses.

The fact that these grants are only available to CASE-certified teachers speaks to the perceived value of the curriculum as a delivery vehicle for science education in the state.

This availability of funds has driven more teachers in Washington to become CASE certified, which in turn has caused many school districts to add CASE certification as a requirement on their job postings.

Washington State University is even offering CASE certification for its agricultural education students as a way to help them leave college more prepared to get their first teaching job.

According to CASE Certification/Digital Learning Coordinator Sara Cobb, CASE adoption isn’t a case of the tail (funding) wagging the dog in Washington, but the recognition that CASE has been carefully constructed to meet many of the benchmarks that schools are requiring of their programs.

That pretty clearly takes care of the Facilities, Equipment, Technology and Materials, and Partnerships elements of the *Quality CTE Program of Study Framework*, but what about the other elements?

### Prepared and Effective Program Staff

In order to teach a CASE course, a teacher must first undergo intensive training called a CASE Institute. CASE Institutes provide teachers with 50 to 100 hours of hands-on instruction related to a specific yearlong CASE course.

More recently, CASE has been exploring ways to condense some trainings into fewer days with pre-Institute homework or one-day sessions called BriefCASE train-

ings for certain courses. For now, though, CASE Institutes remain the primary method of professional development for teachers who want to adopt the curriculum.

“Teachers come to our institutes with a very open mind,” said Cobb. “CASE just wants to help you in whatever way you need. One of the things that is really created by the institute and carries over long after teachers are back at their schools is the cohort of peers that ends up being created. It creates a rich environment of ‘I tried this and it worked for me.’”

“I think it’s the fact that you have to be the student (at a CASE institute),” said Randi. “You have to go through every lesson that the students go through, and it just gets you excited. You get to see what kind of problems you’ll have with the lesson. The other teachers who are there share tips with each other about what they’re going to do to make the lessons run more effectively.”

### Standards-aligned and Integrated Curriculum

“CASE is already standards-aligned,” said Josh. “You go to a lesson, and it says right there what standards it’s aligned with.”

“During a CASE Institute, we ask teachers to identify which competencies and standards align with each activity in a lesson,” said Cobb. “We want them to go through that same practice with their students — make a targeted effort to say ‘This is the standard we’re looking at today. Here are two or three essential questions,’ so students have a focus point.”

### Sequencing and Articulation

“One thing I love about CASE is that it starts with a very basic foundation,” said Randi, “then goes to the next level, especially from course to course. Also, it spirals, so every lesson goes back to another lesson. If they learn about cells in one

lesson, they're going to learn about cells in another lesson."

Because of the rigor of the CASE curriculum, several postsecondary institutions are offering credit for CASE courses. One example of that is Rutgers University, which offers up to 17 transfer credits to students who have successfully completed a specific CASE course. Other institutions that offer some form of articulation garnered with CASE include Michigan State University, University of Maryland, and Blue Ridge Community and Technical College. Iowa is also making agricultural science education more of a priority in its school systems and is using CASE courses to help high school students meet the state's Regent Admission Index to attend Iowa's universities.

## Student Assessment

"When teachers go through an Institute, they'll see that there's no end-of-unit exam," said Cobb. "That's intentional, because we want students to be assessed on their ability to do the higher level — can they analyze, interpret and utilize what they're learning? We use checks for understanding. These are anywhere from three to 10 open-ended, overarching questions which range from the basic 'Do you understand?' to more in-depth 'Here's a problem, how would you have solved it based on this curriculum?'"

"CASE includes multiple forms of assessment," said Randi. "We use the formative assessment provided at the beginning of a unit as a pre-assessment, and there's a quiz at the end of every lesson."

CASE also has an online platform that allows instructors to test students and issue certifications for completion.

## Engaging Instruction

"Each of our courses has a purchasing manual that outlines exactly what an ideal classroom environment for that course would look like," said Cobb. "We like to

model that ideal classroom in our Institutes as much as possible to ensure our participants are experiencing it. It's very empowering to help teachers see that it's not out of reach — it's very doable — and that they can make adjustments for local constraints and still deliver effective instruction."

CASE relies heavily on inquiry-based instruction, which encourages students to engage with a question, problem, or scenario and practice critical thinking and problem-solving skills.

## Access and Equity

"CASE provides a curriculum that can bring agricultural education to learners of all socioeconomic backgrounds," said Cobb. "It doesn't require a school farm or a special shop, so it works in locations where programs don't have that space. It's a way to have a robust agricultural education program, even if you have limitations, which most teachers do, in one form or another."

## Student Career Development and Work-based Learning

Each CASE course has a year long project embedded into the curriculum. That project is always heavily tied to career development. "It allows students to look at careers in a very broad context, then come back and look at specific careers deeply based on a lesson topic," Cobb said.

"Each lesson ties directly to industry. For example, in Food Science and Safety, students are required to keep a research notebook just like you would in the industry. That means CASE students are learning the skills to keep up with industry standards while they're still in high school. They're learning work-based skills along with what it's like to work in that industry. It's supporting work-based learning through implementation of the curriculum as opposed to being an add-on."

## Data and Program Improvement

"There's a really rich discussion going on about data at this point," said Cobb. "We're seeing such a push for ways to collect quality data."

Although it's not an easy problem to solve, one way CASE is tackling this element of a high-quality CTE program is by piloting its first micro-credential this spring. They have partnered with National Occupational Competency Testing Institute (NOCTI) to provide a lab safety micro-credential.

"In every CASE course, students layer on more lab safety," said Cobb. "The goal is that students take a meaningful certification with them, but it will also provide us with data about how well the students are retaining this information."

A CTE program isn't going to suddenly become high-quality just because it adopts the CASE curriculum. The core of what makes a program effective still has to be in place: a good teacher and a supportive administration that understands how the program is helping student achievement.

CASE can help by making it very clear how the elements that make up a high-quality CTE program are being fulfilled. Furthermore, the way it integrates these elements into every course makes it easy for anyone familiar with the curriculum to understand what a program is about.

For the most part, CTE teachers already have a deep understanding of what it takes to create a high-quality CTE program in their schools. CASE just provides a springboard that can make the leap from knowing into doing just a little bit easier. ■

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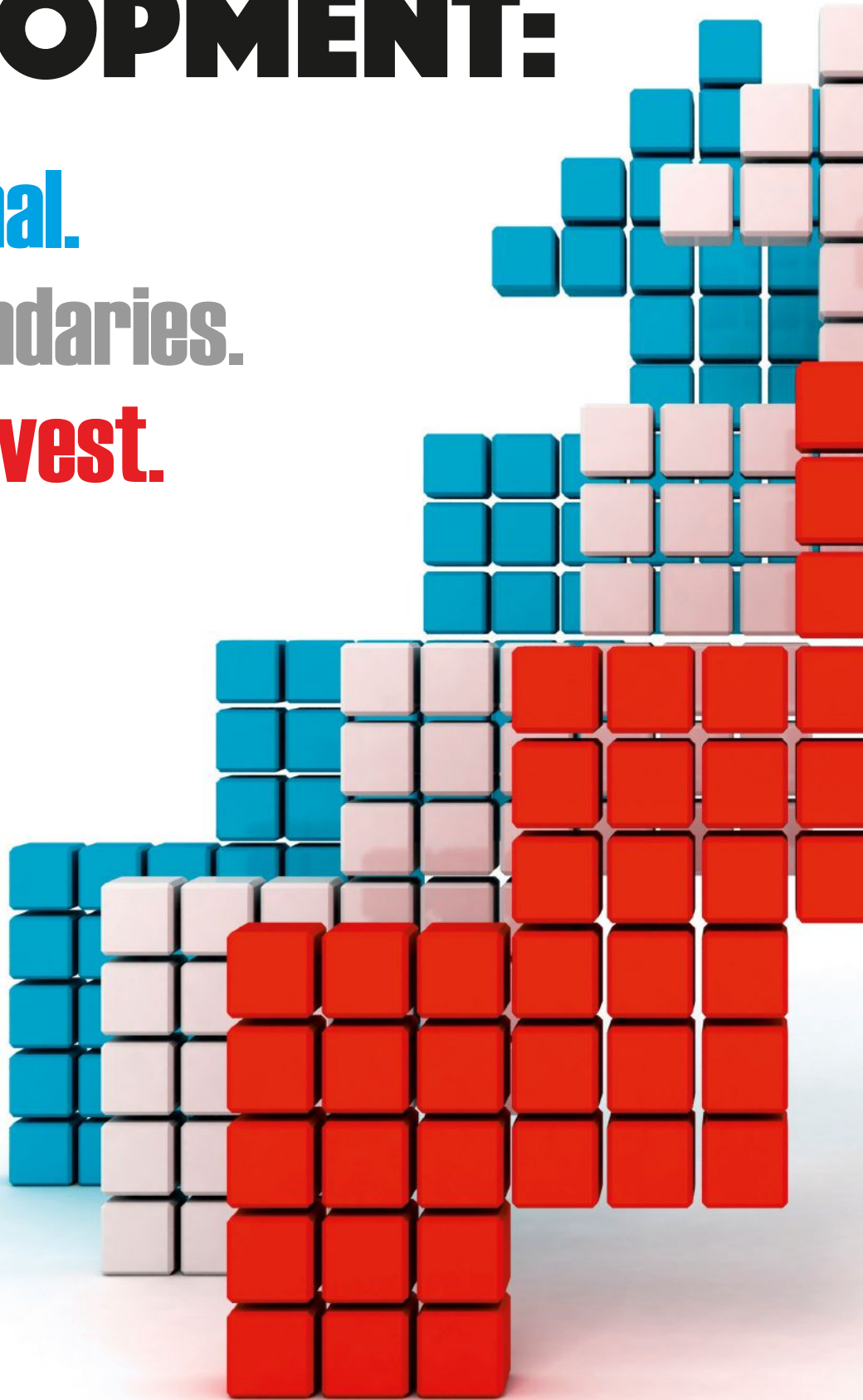
# PROFESSIONAL DEVELOPMENT:

**Be Intentional.**

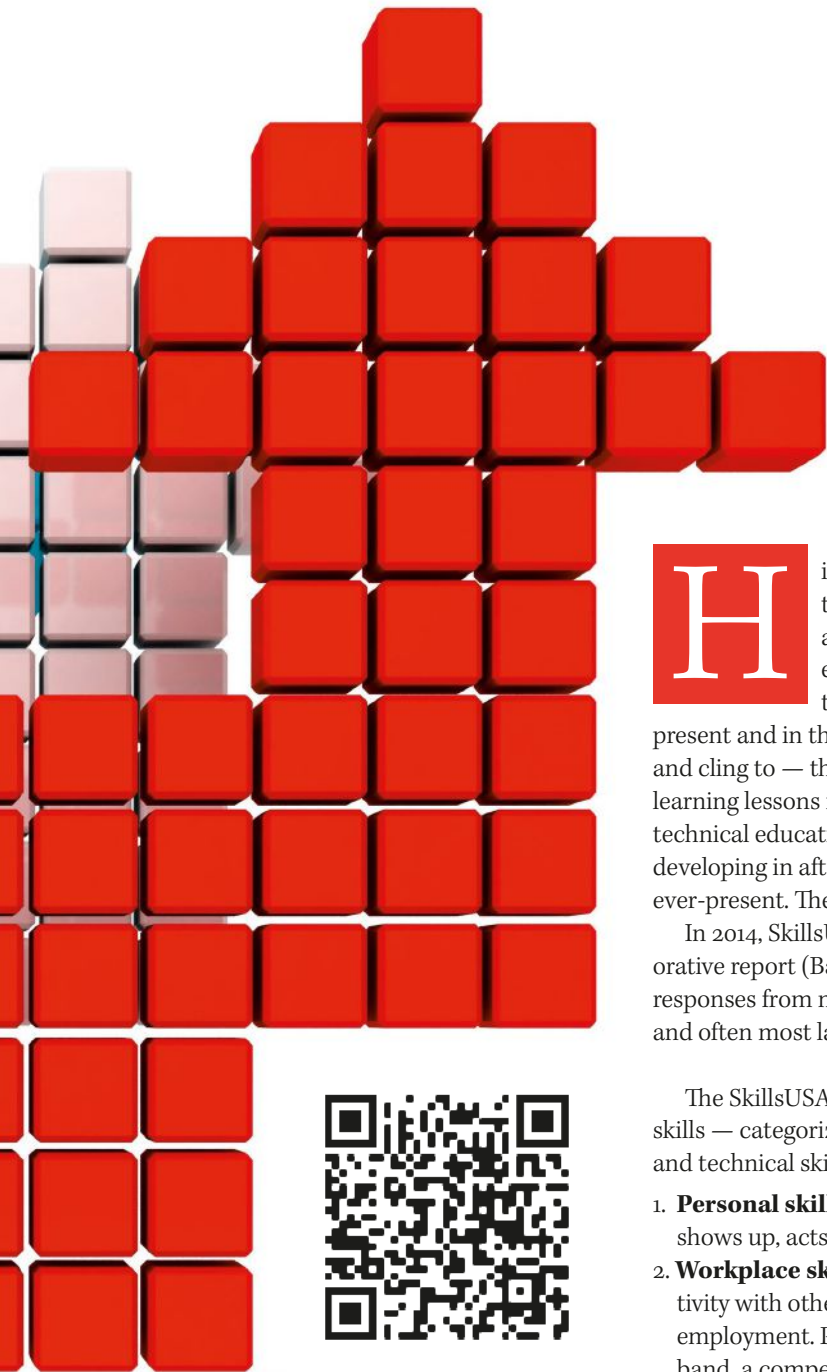
**Create Boundaries.**

**Plan to Reinvest.**

By Anita Foor







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ighly dedicated teachers believe there is always more knowledge to be learned and skills to be gained. We believe that educators of all kinds play a critical role in the lives of students through influence, the ability to tap into a student's interests and abilities, and the opportunity to engage students in their own futures in the present and in the safety of our classrooms. Educators most often understand — and cling to — the fact that growth of our students happens constantly. Whether learning lessons in our classrooms, gaining knowledge and skills from career and technical education (CTE) student organizations or extracurricular activities, or developing in after-school, weekend or summer jobs, the opportunity for growth is ever-present. The same is true for us as educators.

In 2014, SkillsUSA developed the SkillsUSA Framework after reviewing a collaborative report (Barrington, Wright & Casner-Lotto, 2006) that included data about responses from more than 1,000 employers articulating the skills most needed, and often most lacking, in their new hires.

The SkillsUSA Framework includes 17 Essential Elements — employability skills — categorized within three components: personal skills, workplace skills and technical skills grounded in academics.

1. **Personal skills** include the individual's attitudes and approaches to how one shows up, acts toward others, and gets work done.
2. **Workplace skills** include those needed for successful interactions and productivity with other people. Futuristically for students, a "workplace" is a place of employment. Presently, it is anywhere they are part of a team: a family, a school band, a competitive team, an organization or a classroom.
3. **Technical skills** grounded in academics are used by all employees. Specific tools used, training completed, or policies and procedures followed are informed by the specific application of academic and technical knowledge and skills within a particular "workplace."

As educators, we have need for all 17 of these skills as much as our students do. Focus your attention on the Technical Skills component of the Framework and notice that professional development shows up there.

SkillsUSA knows that regardless of where one is in their career and no matter what one's profession of choice is, engaging the skill of developing a professional development plan is key to success.



Use this QR code to access a video of industry partners validating the skills included within the SkillsUSA Framework.

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Create Boundaries.  
Plan to Reinvest.



The SkillsUSA Framework defines career readiness and specifies the transferable skills needed by all employees, regardless of their position or industry.

As we approach the end of this school year, reflect ...

- What were the professional development goals that you submitted to your administration at the beginning of the year?
  - Why did you choose those goals?
  - What plan did you have in place to achieve them?
  - How did you do?
- Was it rewarding or a chore to create them?
  - How did you feel about the work you planned to do as articulated in your goals?
  - Were your plans acknowledged and appreciated by your administration?

Indulge for a moment more and think back to the time you created those goals and consider these questions, also ...

- How much thought did you give to writing your professional development goals?
  - Were they SMART (specific, measurable, achievable, relevant, time-bound)?
- Career and technical education teachers work hard to develop as professionals to serve our students. Some of us committed to a four-year (or longer) teacher-preparation program. An increasing number of us entered the classroom through alternative and/or provisional certifications after working in careers in our industry. Many of us work toward achieving higher education while we are teaching. It's likely that your school calendar includes multiple teacher professional development days, and you may have already identified the ways in which you desire to use the precious days for additional professional development in your teacher contract for the upcoming year.

Professional development is a common concept for educators. We regularly *engage* in it, we often eagerly *seek* it, and we *provide* it to our students every day of the school year. As we quickly approach the end of this academic year, while balancing the thoughts and plans we have for the next one, let's pause. Let's work to execute some clear and specific steps to create professional development plans that ensure we understand how to be intentional about our professional development, how to include boundaries to maximize all we have to offer and not burn us out, and how to make a plan to reinvest what we gain.

### Be Intentional by Beginning with the End in Mind

As you prepare to write your next professional development plan (or even a goal within it), allow yourself the time to identify your endgame, and brainstorm the ideas you have. Avoid starting with the selection of activities, which might include a class, a conference or another event that you're selecting. Ask yourself, "How do I want to grow in a way that serves the long term clearly?" And once you have a clear picture of where you're heading, *then*, and *only then*, begin identifying the ways in which you'll get there. Starting here allows you to start with your "why," and that makes advocating for the time or financing easier because the reasoning is clear from the start. Consider these two approaches:

1. Beginning by identifying an activity I want to attend (insert conference name) for two days.
2. Beginning by identifying why I want to better integrate special education students in my CTE classroom.

When you share the want with your administration, how will they respond? Which approach will spark an immediate connection in their mind between you and the achievement of the school's improvement plan and/or mission? Play it out. Think of an example professional development event or activity you have done in the

past or are considering. Now put the why in front of it and take time to identify the long-term improvement goal you have for yourself. Consider finishing this sentence to get yourself started: *I will be a better teacher and my students will be best served when I can:*

- better manage my classroom.
- be more organized.
- be a better team player.
- better serve minority students.
- better connect my classroom to the community.
- collaborate more with non-CTE teachers.
- collaborate more with other CTE teachers in my school.
- confidently own my content.
- confidently make decisions.
- engage my students in work-based learning.

What is the big picture that you want to exist as a result of your efforts? Start there. Connect the picture of your best self to the picture of your school's best self (its mission).

Once you know how you desire to be a better educator, *then* identify the activities or events that will help you achieve the end you have in mind. Using this approach, you're not asking for time out of your classroom and you're not asking for registration fee financing or travel reimbursement; you're asking for permission and support to achieve the school's mission.

## Create Boundaries to Maximize Self and Minimize Burnout

Students, schools, communities, states and our nation need educators to be invested in themselves through their professional development plans.

*The growth of teachers is one of the most impactful ways in which we can collectively ensure the maximum possible growth of our students.*

In many CTE content areas, the industry standards and expectations are evolving as quickly as the students with whom we work. It's a tall order to keep up as an educator, and when we factor in the other valuable ways in which we can or must invest our time — being a spouse, being a parent, being a community volunteer, leading a student organization, being a coach, being a member of a professional organization, and more — our time and energy can get snatched up quickly.

When you're beginning with the end in mind, you're dreaming big about what's possible, and you're identifying tangible goals that contribute to your bigger mission as an educator. It's also important to spend time identifying your realities — not as obstacles or excuses but as realities — truths that you must responsibly consider. Write them down, while keeping the end in mind.

*I will be a better teacher and my students will be best served when I can ...*

*And I know ...*

- there are 23 hours and 56 minutes in each day.
- I am at school from 7 a.m. to 4:30 p.m. most of my 185 contract days.
- my spouse and children rely on me in the evenings.
- my own children work most Saturdays.
- the all-staff professional development topics for the year include ...
- I will need to complete a grant application to secure funding.
- I have the most "extra" time during these months ...
- my family has a vacation planned during these dates ...
- our summer CTE teacher conference is on these dates ...
- the class I want to take costs \$ \_\_\_\_.
- the conference I want to attend is in (city, state) on (dates).
- I have three professional development days to use this school year.

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- Patrick Biggerstaff,  
former Region III Fellow, former Indiana ACTE President, and currently the ACTE Administration Division Vice President

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These facts get no label other than *facts*. They are not good or bad, positive or negative. They simply *are*.

When we know what we're working with, we can start to identify possibility. So that's the next step: Connect your why-based goals with your life facts. These are your "I can" statements. *Knowing what my end in mind is, and knowing the facts I know, I can ...*

- spend one evening a week away from my family.
- seek financial support from industry partners in my community.
- move my vacation dates.
- give up my volunteer commitments for two months.
- find industry partners to help coach my students in their competitive events.
- engage my student officer team better to take more responsibility.
- build in time to read a book now, and plan for a conference later.

Professional development can quickly become meaningless, or at least viewed negatively, if we feel that we must rush through it, if we find that all other areas of our lives suffer as a result of the commitment we make to professional development, or if we view it as a required "hoop" through which we're jumping. It's OK to find professional development that fits in this season of life while pushing yourself to grow and work toward your end goal. It's OK to discover that our ability to commit to the people and events around us ebbs and flows as we make room for important investments in ourselves when the decisions we make align with our personal and professional missions. But we do have to be intentional about what our boundaries are. We must be committed to those boundaries and communicate them to the people who need to know about them.

Having boundaries does not eliminate the hard work it takes to achieve our professional development goals or our personal goals. Boundaries do not give us permis-

sion to "check out" on many of our existing responsibilities. Boundaries build buffers for us to have the space to make choices, to exercise our priorities, and to be in conversation with the people around us who are most important to and in our success.

### Plan to Reinvest

Do you remember that professional development conference you went to where you read every book cover to cover, organized all of the handouts you picked up in a neat binder, and implemented all of the awesome tips and ideas you learned? No? Me neither.

It's not uncommon to feel the fire burning during the professional development event and often, for a while, post-event. Then we check back in to our "normal" lives and before we know it, another quarter or semester has come and gone without us getting to all we had planned by way of professional development implementation.

Let's revisit where we've been ...

1. Start with the why.
2. Identify the why-based activities and events.
3. Identify your life facts.
4. Make your "I can" statements.
5. Build and communicate your boundaries.

Equally as important as any of these steps is completing your professional development plan, which must include building in the time to plan to reinvest what you achieve in the professional development events. Much like you build time into your lesson plans for students to reflect on their learning, build time into your professional development plan to reflect on your own learning, and determine how you'll carry it forward. Here are some questions to guide you:

- Who supported you in the professional development, and how can you share with them the results of their invested support?
- What can you share with your students about your professional development to demonstrate the ways in which

you're constantly investing in them and to demonstrate that professional development is a necessary and rewarding component of any career?

- How does/will your classroom look and feel different as a result of what you learned?
- Have you achieved your end in mind, or is there more to do? How can you build on what you gleaned?

We can busy our selves with a great deal of professional development, and if we aren't intentional about our reflection of that development, that's all we are: busy. Let's be busy about purposefully achieving our big pictures by carrying our intentionality all the way through to reflection and implementation.

In the United States, more than 19,000 educators identify themselves as professional members of SkillsUSA. These educators receive access to curricular resources to teach their students about the skills identified within the SkillsUSA Framework. They also receive support in developing and sustaining a thriving career and technical student organization at the local level, and access to many technical skill workshops. Hopefully, professional membership in at least one organization is part of your annual professional development plan. Professional organizations can provide sustainable, ongoing and timely resources that are readily available for members. This type of professional development can support the entirety of a professional development plan with little effort on the part of the member.

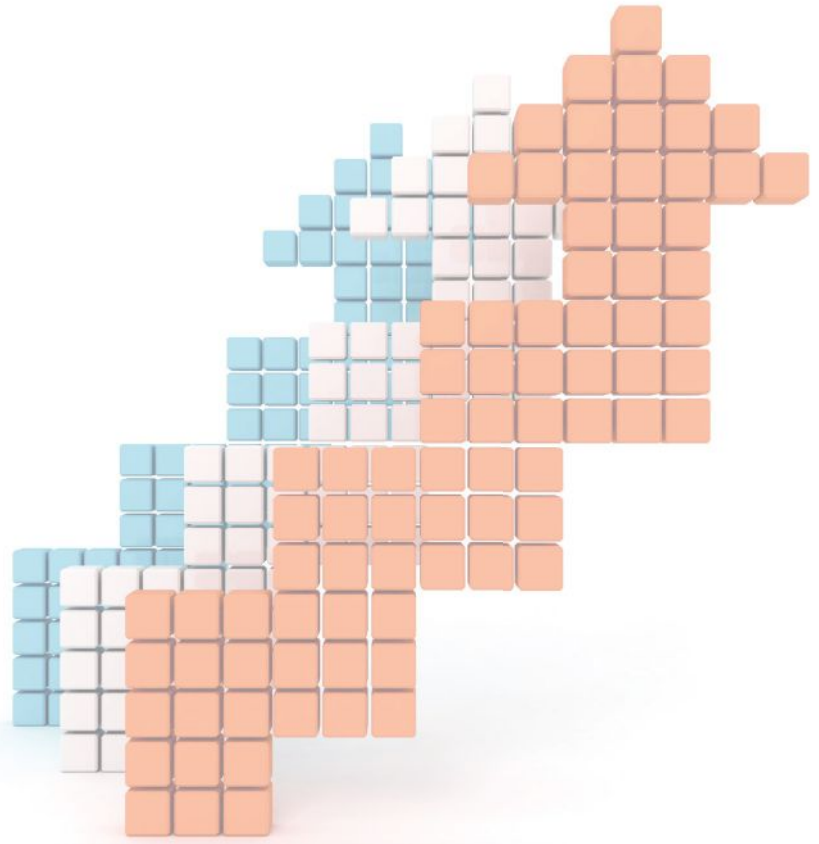
In addition to planning for how you can be a better classroom teacher, team player on your staff, or technical content expert, consider how you can develop or polish the skills included within the SkillsUSA Framework. You're likely one of the most consistent models for your students' development of these skills, and your expertise in them matters greatly. Create a professional development plan for the upcoming school year that is more intentional than

ever — in the plan, in the boundaries, and in the follow-through. ■

**Anita Foor** is a career and technical education teacher currently serving teachers, students and industry as the senior manager of curriculum and instruction at SkillsUSA. She believes all learners need and deserve the employability skills that allow them to invest in others through meaningful employment. Email her at [afoor@skillsusa.org](mailto:afoor@skillsusa.org).

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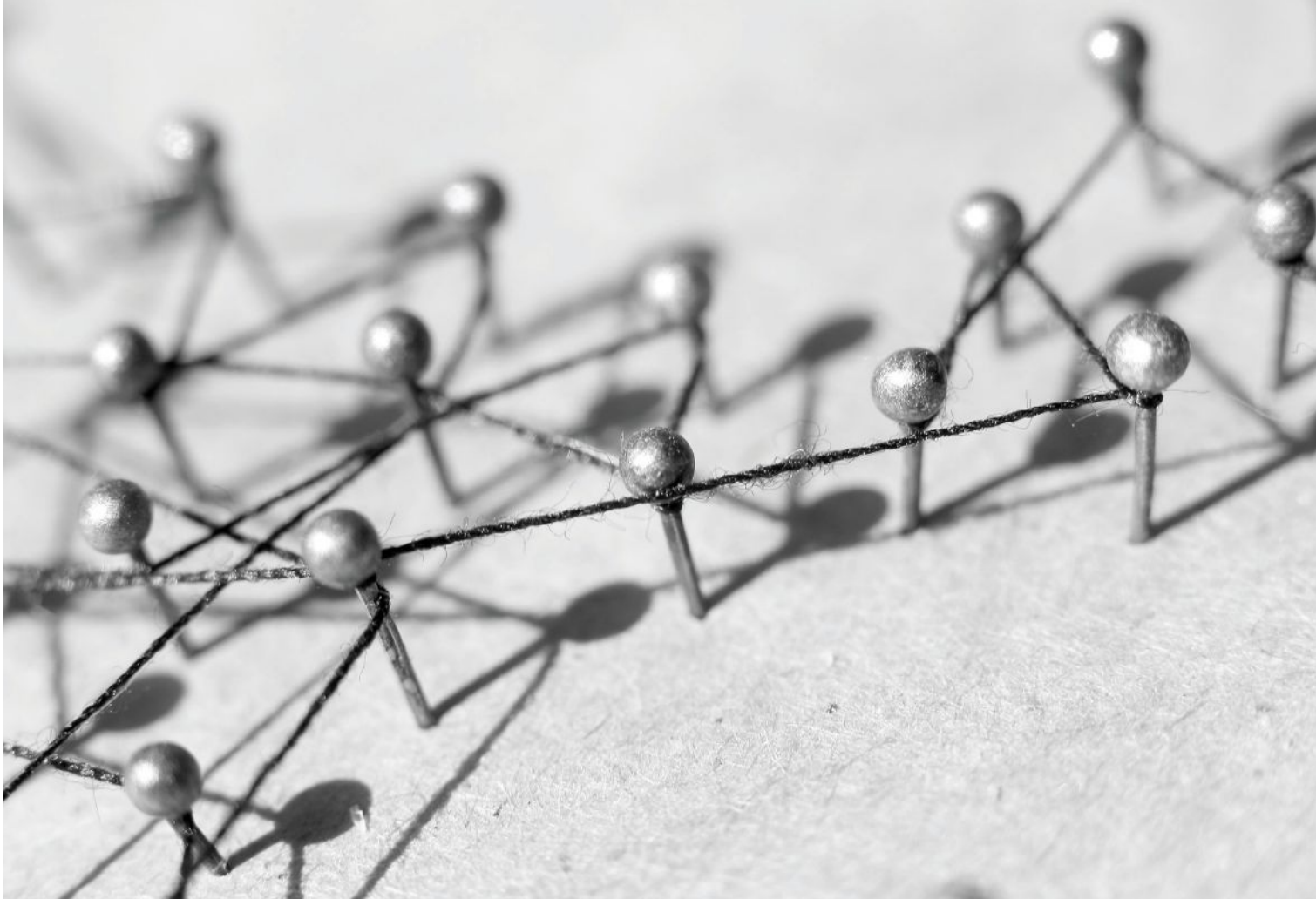
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# Common Thread

By Sari McCoy

## PROFESSIONALS WITHIN ALL INDUSTRIES SEEK TO REFINER THEIR CRAFT WITH NEW KNOWLEDGE AND

skills in order to grow and strengthen their performance throughout their careers. In education, professional development is not a one-time experience but rather a continuous process as we develop the skills necessary to maximize student achievement. “For teachers and school and district leaders to be as effective as possible, they continually expand their knowledge and skills to implement the best educational practices. Educators

learn to help students learn at the highest levels,” said Mizell (2010).

To ensure that CTE courses are industry relevant, we seek to employ field experts. Often these individuals are accomplished, perhaps even distinguished, within their area of expertise; their substantial experience makes them invaluable to educational institutions. But if asked, most would not claim to be highly skilled classroom instructors.

Consider an award-winning chef who decides to exchange his kitchen for a high

school classroom of 28 students. With those 28 students come innumerable acronyms, a professional learning community, hall duty and an expectation to deliver high-quality, differentiated, culturally responsive instruction. Additionally, if it is a college-credit-earning course, the chef must apply for credentials with the affiliated higher education institution. Unlike traditionally prepared educators, this chef begins his journey without any pedagogical training and relies on his subjective philosophies of the teaching-learning process.



A lack of pedagogical training does not disqualify someone from being a highly effective instructor.

It does, however, provide an opportunity for our administrators to intentionally design the support provided to our industry experts as they transition from the field into the classroom. One significant resource employed to provide teachers with instructional best practices is the professional learning provided by AVID.

## Faculty Development

Annually, AVID offers various learning strands at Summer Institutes across the country. Attendees include administrators, counselors, teachers, instructional support staff, and more. These strands are designed to address specific audiences and focused content areas across all levels of the academic journey — kindergarten through higher education. During the professional development experience, an AVID instructor models content-specific best practices, which allows the teacher to experience strategies from the student's perspective. Not only are the teachers able to master the strategies for their own delivery, their experiences allow them to

customize the strategies for their students in their courses (AVID, n.d.).

CTE teachers recognize that their students must learn to navigate technical reading materials and adopt an industry-specific vocabulary, which can be very overwhelming and discouraging to students. A CTE teacher attending AVID Summer Institute may choose to attend the CTE strand, which “will explore how AVID’s teaching strategies can be used to create a teaching and learning environment that supports all CTE students for college and career readiness and success in a global society” (AVID, 2020).

Additionally, if the CTE teacher desires to specifically focus only on reading strategies, AVID offers an English Language Arts strand focused on exploring texts with strategic reading. Attendees are equipped to help students learn how to mark the text, group the material into small sections and deepen their comprehension of the information. “The strand primarily focuses on AVID’s critical reading process, which includes planning for reading, selecting the text, prereading, building vocabulary, interacting with the text, and extending beyond the text. Writing, Inquiry, Collaboration, and Organization are included as tools for

developing critical reading skills across genres, from the foundational to the advanced levels” (AVID, 2020). Intentionally focused AVID professional learning strands provide fundamental best practices that are applicable to any industry cluster and are scalable for any classroom, including college-credit-earning courses.

Our CTE programs of study are typically designed to progress students toward an industry-relevant outcome, such as an industry-based certification, college credit or a college degree. Just as these outcomes are stackable, so are the strategies we use in order to deepen the learning and propel the student toward success. Across the country, the increased complexity and rigor of career preparation courses is notable, especially with the rapid growth of CTE in early college high school frameworks. According to the Pathways in Technology Early College High School (P-TECH) network, there are 92 career-focused early college high schools in the United States and 200 globally (n.d.).

Providing high school students the ability to accelerate and have early access to higher education is both exciting and challenging. Students, beginning in the eighth grade, are charting a course toward their

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future careers by earning industry-relevant certifications and technical skills, while simultaneously attaining a high school diploma and a college degree. Consider the chef, a newly credentialed college adjunct teacher, who lacks pedagogical training. This CTE instructor needs the knowledge and skills to provide high-quality differentiated instruction, the ability to provide said instruction with college-level rigor, and to build a student's social/emotional capacity to handle the acceleration and pacing. This level of an educator's craft takes time and experience to develop. In the interim, the professional learning AVID provides fills the teaching-learning process gaps quickly and enables the teacher to offer intentional instruction sooner rather than later.

## Social and Emotional Development

As CTE educators, we are charged with not only ensuring that all students gain the knowledge and technical skills necessary for future success, but also the social and emotional capacity that the working world requires of our students. CTE educators traditionally incorporate the skills necessary to be employed in their curricula — skills such as responsibility, teamwork, communication, work ethic, and critical thinking. There are indicators to reflect the level of knowledge and technical skill students attain, but indicators to measure the social and emotional development in students are, unfortunately, lacking.

Many of our CTE teachers utilize the AVID instructional strategies that focus on building the social and emotional skills necessary for success in college and careers. Within these best practices, students develop organizational skills, time-management strategies, professional communication habits and more. These skills are essential not only for the student's success in their work-based learning or internship experiences but also to

sustain them through the academic rigor of college-level coursework (AVID, n.d.).

Health care students, for example, desperately need the social and emotional capacity to stand next to the bedside of a patient at the age of 19 and confidently provide them with high-quality care. They need the ingrained strategies of time management and organization to effectively balance nursing school, work and family. Students need their AVID-trained CTE teacher to be an industry expert so they can gain as much workforce knowledge and skill as possible prior to graduation, as well as to have the strategies to build the essential learning habits that will sustain them through their academic journeys.

The CTE course framework provides students the ability to exercise their newly gained knowledge in a simulated or real-world environment. AVID strategies enable our teachers to be meaningful and engaging in their instruction, creating a safe environment for students to succeed and fail within that framework. Integrating AVID into faculty professional development equips teachers with engaging, rigorous and proven instructional strategies that move the needle forward.

AVID professional learning benefits many other educational staff, not just teachers; administrators have the opportunity to immerse themselves in focused training as well. When campus and district leaders are equipped with high-quality, researched-based instructional practices, they are able to provide meaningful professional learning for their staff. They are also empowered to differentiate their professional-learning framework to support both the traditionally and nontraditionally prepared teachers. Utilizing the AVID strategies for their staff, administrators reinforce the tools of experienced teachers and quickly narrow the gap of the new instructors who lack pedagogical training.

In CTE, we prepare our students for the world of work, and we are developing high-quality, sustainable workforce pipelines for all industries across the nation. As administrators, we expect our teachers to deliver highly effective instruction for greater student achievement. By implementing the AVID best practices acquired in their professional development, CTE instructors have the ability to monitor the social and emotional growth of our students, to provide academic intervention and support for rigorous college-level courses, and to provide high-quality, engaging and differentiated instruction for all students. AVID can be the common thread that provides college and career strategies to ensure that *all* student outcomes and goals are met with excellence. ■

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**Sari McCoy** is the executive director of Career & Technical Education in Richardson ISD and serves the students in all career-focused programming and the College & Career Ready School Models (CCRSMs) across the district. She began her career journey as an emergency/trauma registered nurse and is celebrating her 16th year in education.

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# Career Growth Through Individualized Professional Development

By Gary Meers, Michelle Conrad & Douglas Bush

## MANY TIMES, CAREER AND TECHNICAL EDUCATION (CTE) EDUCATORS TARGET THEIR PROFESSIONAL

development to complete compliance and credential requirements. While it is important to meet these requirements, CTE educators need to expand and personalize their perspective when it comes to their professional development goals. They need to determine how much and in what form they need professional development in order to remain current in their technical field as well as maintain whatever credentials or

licenses they have. The other professional development consideration is to expand their knowledge and skills as professional educators. The way to meet both of these development needs is to create an individual development plan (IDP) that meets career goals and promotes career development.

In preparation for creating an IDP, CTE educators need to work through a series of steps that will enable them to understand where they are currently and what they need to do to expand their career development. Once completed, the IDP will serve

as a guide, providing specific goals, objectives, timelines and necessary supports so that the educators will be able to follow the outline sequence to achieve the career development they seek.

## Conduct a Status and Needs Assessment

As with any project, there needs to be a review of the status of what professional development has been accomplished thus far: credentials earned, certifications ac-

quired, degrees completed and all partially completed work. This will provide educators an understanding of where they are in their career development. The next task is to list the needs that exist in these areas.

- What continuing education units (CEUs) are required?
- What workshops need to be taken to keep certifications current?
- Do additional college credits need to be taken toward a degree or salary step?

### Identify Strength Strands

It is common for individuals who want to create IDPs to focus on their areas of need rather than identify their areas of strength. It is important to list strength areas because they are the foundation on which the individual development plan will be built. Educators know what their skill sets are, and it is important to identify and build upon them.

Once the strength strands are identified, educators can look at their needs areas and see how their IDPs will meet these needs while using their strengths to expand their career growth.

### Target Development

Many educators do not create IDPs because they take a scattered approach to

professional development. They attend required workshops or participate in seminars that are of interest to them without having a specific plan for how the information they receive will benefit their career growth. To avoid this, they need to ask the following questions when targeting their professional development.

- What return on investment will I receive from spending time attending and completing the work required for this development activity?
- What professional development activities should I participate in based on my career goals?

The reality is that many forms of professional development are required and thus no choice can be made in regard to attendance, but that should not have an effect on how these required efforts are valued. By having an IDP and setting learning goals, educators can look for learning and growth opportunities in every professional development event in which they participate.

### Set Goals

Goal setting for professional development has a couple of approaches educators can use. They may set long-term goals or focus

on short-term goals that lead to long-term results. In some situations, there may be a combination of both. The key is that these goals need to be clearly defined, and under each of these goals, steps should be listed for how to achieve them.

The goal-setting process needs to be seen as part of a sequence built upon the previous steps. Completing the needs and status steps will help to clarify and facilitate the goal-setting effort and will help determine what goals are set and how they are going to be accomplished.

### CTE Learn

CTE Learn is a relatively new online community developed and supported through ACTE in partnership with MaxKnowledge, an e-learning professional development company. Access to the community is available through ACTE's website: Go to the Professional Development tab and select "CTE Learn," which will then redirect to the online learning network. Each course takes approximately four hours to complete and is available for CEUs or, in some cases, college credit when CTE Learn courses are combined to equate to college breadth (for an additional fee). Topics focus on effective teaching and

leadership strategies and can be tailored to meet individual learning needs. (ACTE members receive a discounted price.)

## Courses Available

There are more than 150 courses in CTE Learn for teachers, administrators and leaders, career services and support staff, and online teaching. Courses are available for both secondary and postsecondary educators, with some for a fee and others for free. For new teachers, there are specific courses regarding the first year as a CTE teacher, instructional planning and design, and teaching professionalism. Other teacher courses available include teaching with technology, supporting diverse students, STEM & CTE, and global competency in CTE. For leaders and administrators, there are specific modules for CTE administration, as well as managing workplace challenges, supervisory skills and strategic planning. For career services or support staff, there are classes on developing a social media strategy, job searching and interviewing. There are also free workplace skills tutorials that cover career development and communication skills.

Unified ACTE states can directly access a portal for training and easy communication through the Career Ed Lounge and IDP development. These training tools give CTE administrators, teachers and staff the opportunity to individualize training for their own learning needs. This can target specific learning goals and assist in developing high-quality CTE educators and programs.

## The Case of Michigan

Michigan, like most places, faces challenges in finding and retaining high-quality CTE educators (Mills, 2019). Though there is a shortage of educators generally, it is particularly the case in CTE (Francis, 2019). It was with this reality in mind that Michi-

gan ACTE (MI ACTE) saw the potential of CTE Learn to provide a resource that could help develop high-quality educators who would have the skills needed to experience success and, as a result, have longevity in the field of CTE education. There are CTE teacher-preparation institutions in Michigan, but there are not enough pre-service educators coming through the programs to meet the demand in the field. As a result, many educators are hired straight from industry (Public Policy Associates, 2020; VanHulle, 2018; Mills, 2019). These educators have the content or skill expertise but often do not have the pedagogical background needed in a class setting. CTE Learn offers courses that can help develop these skills and provide strategies that others may have learned in a postsecondary teacher preparation program.

Of course, even young teachers from a teacher education institution and veteran educators struggle with various aspects of teaching. Michigan CTE administrators often find they need to develop an individual development plan (IDP) with these teachers (Thrun Law Firm, 2019). The needs could vary greatly so a one-size-fits-all approach may not be effective. There are a few custom conferences offered for CTE, but they generally cannot be specific enough to address IDP goals. They typically involve travel, hotel, and meal expenses and require time away from instructing the students. CTE Learn can offer targeted professional development to support an IDP without travel expenses or time away from students. One of these free resources offered on the CTE Learn portal is an IDP creator.

Administrators who identify teachers needing support because they are out of industry, new to the field, or struggle in a particular area can work with the teacher to develop an IDP with the IDP application. They establish goals, identify activities, create an action plan and document success

through the IDP application. Administrators can target specific areas of need and align these to the appropriate learning course(s). Upon successful completion of the learning course, the educator has evidence that can be uploaded into the IDP application to demonstrate training that supports the IDP goal.

Beyond the administrator-directed professional development, certified teachers, counselors and administrators in Michigan have to obtain 150 continuing-education hours of professional development in a five-year period to be able to renew their certificate. New teachers are required to have even more. Teachers sometimes find it hard to find professional development options that are CTE specific. There is enough content in the learning courses that they can be used to acquire the needed hours; and, just like those required by administrators, there is no travel or absence from the classroom.

When CTE administrators need tools and resources to address an entire staff, it can be difficult to obtain resources to support staff development, such as building culture, professionalism or other general topics. Administrators who have looked through the courses and found topics that they want to share with an entire staff can assign a learning course and then work through the course as a group in their staff meetings. The materials and resources make guiding the staff through the topics much easier and more relevant.

There are also times when educators just want to improve their craft. They can use the free CTE lessons, the Workplace Skills Tutorials or the Career Ed Lounge, which gives them an opportunity to connect and network with peers with similar issues across the country.

The opportunities for practical application of the CTE Learn resources are growing in Michigan, helping teachers, support staff, counselors and admin-



istrators. As educators realize more support, expertise and success in their field, they are more likely to be retained, which benefits everyone.

**Target Results**

As with any endeavor, success can only be achieved if action is taken. The previous steps have set the stage for individual professional growth. It is at this point that educators move out of planning into the implementation phase and start to see their IDPs come to life. They enroll in classes, participate in workshops and complete specific projects that move them closer to their career goals while expanding their professional expertise.

Educators who created career portfolios can record their professional development in these portfolios while also adding other credentials they have earned, along with skill badges and/or any other validators of their accomplishments.

The end result of strategic personal professional development will be expanded opportunities for individual educator growth, enhanced instructional delivery and a higher degree of personal satisfaction by educators as they prepare students to enter career and technical fields. ■

**Gary Meers** is past president of ACTE, former CTE teacher educator at the University of Nebraska, author of over 125 articles and three books covering CTE topics, and currently vice president of MaxKnowledge, ACTE's e-learning partner providing online professional development for CTE professionals and supporting CTE students for career success.

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self-efficacy, and most recently, CTE for students with disabilities.

**Douglas Bush** is the associate superintendent for CTE at the Gratiot-Isabella Regional Education Service District, president of Michigan ACTE, ACTE Region I Policy Committee member and ACTE Audit Committee member. He serves on the executive board of Michigan's Career Education Planning District Council. He was a teacher for eight years and has been at various levels of administration for 21 years.

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# Engaging Bored, Checked-out Students

## Coding and robotics delivered with familiar technology and tools can do the trick

By Erin Barr

**AS TEACHERS, WE ARE TASKED WITH ENGAGING EVERY STUDENT AND PROVIDING DIFFERENTIATED** instruction to create an optimum learning environment. However, today's students are bombarded with technology that is so appealing, it can override interest in traditional classroom methods. Think about your students who are constantly texting or talking about the latest video game they

are playing. Many of these students need to be involved with novel classroom experiences that pique their interests and teach them skills related to their high fascination with technology. Among the multiple options available, two guaranteed winners include coding and robotics.

I have experienced incredible success using both robotics and coding in my

classroom as conduits to reach bored students and immerse them in the learning objectives. I had one student recently who was often off-topic, playing with a phone and nearby objects, constantly trying to engage classmates in conversation. This student was very adept at getting adults to engage in off-topic conversation, too.

Enter the robots! I introduced robots and gave the class time to explore the basic functions. The next day, this same student returned with fresh knowledge of the robot from the previous night's research. Suddenly, I had a student who completed unassigned research and quickly gained a better understanding of the robot than I had. This student was all-in and ready to absorb anything I wanted to teach while we were using the robots, taking on the role of classroom assistant and helping other students when I was busy. With time, the student began to focus across all classes that we had together, even when we were not using the robot.

**Coding and robotics programs are great ways to engage bored or checked-out students, but they also offer significant potential for learning outcomes across the curriculum.**

Students can turn abstract concepts into concrete ideas through real-world learning. They can collect data, create solutions to everyday problems, and develop new skills that can open them to a world of amazing careers.

Are you ready to reach your bored, checked-out students using coding and/or robotics? Here are three tips for getting started that I found helpful:

- **Tip 1:** I once had an art professor who told us that glitter is so provocative to students that they will put it on everything, everywhere. It is best to let them create a project and use glitter to their heart's content so that they get it out of their systems. I find coding and robotics are the same way! Students want to go rogue by pushing the buttons, adding lines of code, etc. Introduce students to coding/robotics in a lesson where they are given a choice of two or three challenges that allow some independent exploration and discovery.
- **Tip 2:** Dip your toes into coding or robotics with financially accessible products that the school can provide for every grade level. It can be difficult to get financing approved for coding or robotics, but starting with smaller, less-expensive models can give teachers a chance to showcase the success of the program. This can lead to approval of more expensive and advanced products in the future.

I found KUBO Robotics by Pitsco Education a great way to get started in coding and robotics for grades K-5.

- **Tip 3:** After you and your students feel comfortable with introductory level coding and/or robotics, it is time to move on to more advanced models that provide more flexibility and challenges for students. This gives your students more experience and prepares them to enter high school or college with the skills that could lead them to a science, technology, engineering and mathematics (STEM) career.
- **Bonus Tip:** If your school is unable or unwilling to invest in coding or robotics, there is an abundance of grants available. STEM is such a popular buzzword right now and can help narrow your search for an appropriate grant. ■

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**Erin Barr** has teaching endorsements in elementary, English as a second language, and special education. She currently teaches students with visual impairments and has a passion for providing STEM/STEAM education to all students.



# FACEBOOK

## Prepare your students for a future in digital marketing with free online resources



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In the past eight years, careers in digital marketing have grown more than

**92%**

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Demand for digital skills in marketing continues to grow. Research shows that digital marketing jobs are growing 30% faster than overall marketing positions.<sup>1</sup> In fact, digital marketing remains the top area of demand for marketing talent – ahead of creative services – with digital advertising skills being the most sought-after.<sup>2</sup>

**3/5**

of employers are seeking talent with digital marketing skills, more than other marketing disciplines

### ACCESS A WORLD OF FREE RESOURCES & GET YOUR STUDENTS CERTIFIED

#### 1 Jump into our Educators Portal

Facebook's new Educators Portal gives educators access to free online educational content. With 25 modules – which can be easily integrated into your lessons – provides digital marketing training, experiential learning opportunities, and client case study analysis. Take learners through the basics of digital marketing – from starting a campaign through to executing and measuring a campaign.

Bring the world of digital marketing into your lessons and build a pathway for students to earn a Facebook Certified Digital Marketing Associate Certification.

#### Create your free Educators Portal account and start preparing your students for careers in digital marketing: [fb.me/ACTEedu](https://fb.me/ACTEedu)

#### THE EDUCATOR PORTAL INCLUDES

- 25 modularized lessons for integration into your already existing curricula
- Presentation materials & student activities
- Facilitator notes & suggested teaching time
- Client case studies
- Corresponding online learning to reinforce engagement and mastery

1. Source: "Demand for Digital Marketing Skills Doubles" - Burning Glass Technologies; 2"Marketing Hiring Trends Report" by McKinley Marketing Partners (survey of 329 marketing professionals in the United States)

## 2 Online Learning for Students

Facebook Blueprint also offers real-world, free educational content to build digital marketing skills – from the basics of starting a campaign to measurement and analytics. Students can continue to build their skills in their own time and prepare themselves for a career in digital marketing.

By combining your lessons using the content from the Educators Portal, with the six hours of continued online learning, your students will have the confidence to earn a Facebook Certified Digital Associate Certification.

Benefits of the online learning content:

- Students learn at their own pace & time
- A practice assessment will instantly help them understand areas they're good at and areas they need to improve on

**Your students can access free online video tutorials and training: [fb.me/ACTExFB](https://fb.me/ACTExFB)**

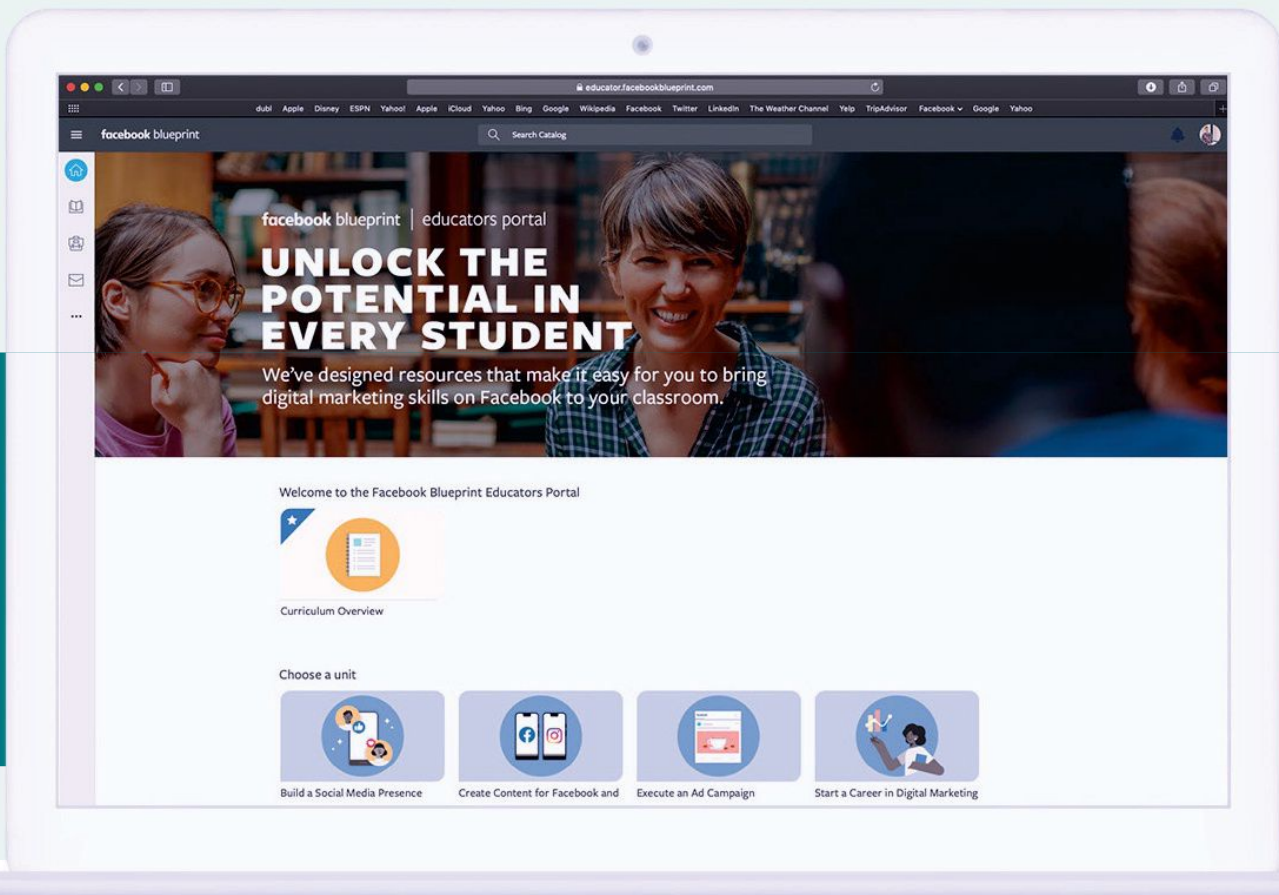
## 3 Certification for Your Students

Our Facebook Certified Digital Marketing Associate Certification will provide your students with industry-recognized credentials. On passing the associate-level certification exam, the credentials adds immediate value to your students' resume, helping demonstrate their competency in Facebook advertising and marketing tools to future employers.

The Facebook Certified Digital Marketing Associate Certification exam covers five key areas:

- The Value of Facebook
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**Help your students earn their Facebook Certification: [fb.me/acte/associate](https://fb.me/acte/associate)**



## Collection of Online- & Distance-learning Resources

ACTE continues to update its compilation of online- and distance-learning resources that can supplement your school's official guidance and build confidence in your online teaching abilities. Visit [acteonline.org](http://acteonline.org) for the most up-to-date resources.

## Share Resources, Ideas & Lessons Learned from COVID-19 Pandemic

Are there innovative ideas as career and technical educators you have or have seen and can share from the COVID-19 pandemic? ACTE would like to feature them in September 2020–May 2021 issues of *Techniques* or on PAGES, a *Techniques* blog. Learn more about writing for *Techniques* at [acteonline.org/techniques](http://acteonline.org/techniques).



## Share and Gather CTE Innovations at VISION

Join thousands of career and technical educators, business professionals and industry leaders at ACTE's CareerTech VISION, happening **Dec. 2–5** at the Gaylord Opryland Resort & Convention Center in Nashville, Tennessee. This year's conference features keynote speakers Kevin Brown, author of *The Hero Effect®: Being Your Best When It Matters the Most*, and Kevin J. Fleming, author of *(Re)Defining the Goal: The True Path to Career Readiness in the 21st Century*. You will experience four days of unparalleled networking and professional development, concurrent sessions covering innovations in secondary and postsecondary CTE, and stories of successful education and business collaborations. Early bird rates are now available through **July 10**. Visit [careertechvision.com](http://careertechvision.com) to learn more.

## 2021 Board of Directors: Nominations Are Open!

Nominations for the 2021 ACTE board of directors election are now open! Applications are due **June 15** and are

collected through the Awards Portal. More information, including application link and guidelines, can be found at [acteonline.org/board\\_election](http://acteonline.org/board_election).

## Fellowship Program Accepting Applications

The ACTE National Leadership Fellowship Program is accepting applications for the 2021 class of fellows! Please consider taking part in this opportunity for professional development, increased policy knowledge and leadership development! The fellowship program requires a one-year commitment from January–December 2021. Applications are due **Sept. 15**. Learn more at [acteonline.org/fellowship](http://acteonline.org/fellowship).

## Build Your Students' Employability Skills

ACTE's partnership with Accenture provides ACTE member institutions and their faculty free access to the rich resources from the Skills to Succeed (S2S) Academy. Available free of charge to career and technical educators, the S2S Academy, an online experience for students, features an engaging multimedia interface that delivers high-quality career planning, job exploration and a unique flight simulator for job seekers. To access these online courses for your students, visit [acteonline.org/s2s](http://acteonline.org/s2s).

## New York, Texas & Washington, D.C., Join the CTE Learn Network

Three state associations have launched their online learning portals by becoming a part of the CTE Learn network. New York State ACTE, DC ACTE and the Career and Technical Association of Texas have begun providing their members access to the more than 150 online courses and dozens of free professional development modules available through CTE Learn. In addition to this content, New York is planning to add

customized state-specific courseware to their site in partnership with their state's administrator association and their technical assistance center.



## Signature Event for CTE Administrators

Happening **Oct. 7–9** in beautiful Cape Cod, North Falmouth, Massachusetts, ACTE's and NCLA's Best Practices and Innovations in CTE Conference will offer content-rich programming and networking to strengthen the field for CTE administrators of both secondary and postsecondary CTE programs and institutions. [acteonline.org/bestpractices](http://acteonline.org/bestpractices)

## Deadline Extended for Student Trophy Design Contest

Due to the COVID-19 pandemic and the disruption to the school schedule, we have extended the deadline for the student trophy-design contest to **June 30**. The winning trophy design will be 3D-printed by Stratasy and presented to the 10 national award winners at the 2020 ACTE Awards Gala on Dec. 2 in Nashville, Tennessee. Visit [acteonline.org/student-trophy-design-contest](http://acteonline.org/student-trophy-design-contest) to learn more.

## Impact Awards – Deadline Extended

The ACTE Impact Awards recognize groups and individuals from the education, business and industry communities who contribute to the improvement, promotion and development of CTE. The deadline to apply for these two awards, the Business-Education Partnership Award and the Champion for CTE Award, has been extended to **June 30**. Learn more at [acteonline.org/acte-impact-awards](http://acteonline.org/acte-impact-awards). ■

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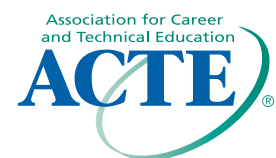
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- 20+ free tutorials to enhance your workplace skills
- The Career Ed Lounge, a professional learning community where you can connect and collaborate with your peers
- Interactive Development tool to track your performance goals

**View the complete collection of offerings at [ctelearn.org](http://ctelearn.org).**



Online Learning Center

# ENERGY-MANAGEMENT TECHNICIAN

By Susan Reese



Students at Lane Community College have the opportunity to earn an associate's degree or a certificate in the innovative Energy Management Technician program.

## ENERGY-MANAGEMENT TECHNICIANS PROVIDE TECHNICAL SUPPORT FOR THE MANAGEMENT

and improvement of energy performance in buildings, industrial plants and other facilities. They help ensure that the electrical and mechanical systems and the building's infrastructure are managed so that energy consumption is optimized or reduced. Their duties include analysis of heating, ventilation and air conditioning systems, lighting systems, plug loads, and end-user interaction with the building. They may also direct the operation of direct digital-building automation systems and evaluate a building's fire-protection systems, environmental-control systems, and other utilities.

## The Workplace

Energy-management technicians may work with engineering firms or at indus-

## SCHOOL SPOTLIGHT

# LANE COMMUNITY COLLEGE

### AT ITS SIX CAMPUSES IN LANE COUNTY, OREGON, AS WELL AS THROUGH ONLINE COURSES,

Lane Community College (LCC) serves more than 25,000 students per year, offering transfer, career and technical, and personal enrichment programs. Its campuses include the Main Campus, the Mary Spilde Downtown Center, the Dental Clinic and the Aviation Academy — all of which are located in Eugene — as well as campuses in Florence and Cottage Grove. The Co-operative Education partnership between LCC, its students and the business community integrates academic studies with on-the-job experience, and each year more than 500 students take advantage of the opportunity, working at Cooperative Education job sites. According to LCC, it is one of the largest co-op programs in two-year

colleges in the United States.

Opportunities for high school students include College Now, in which high school students can earn LCC credits for approved courses taken at their high schools, and Career Pathways, a program that helps students select classes required to work toward a specific career and enables them to begin taking classes at their high schools or at LCC. There is also a collaborative effort between LCC and local schools known as Regional Technical and Early College, which focuses on career and technical classes held at LCC.

Among the notably innovative programs at LCC is the Energy Management Technician program, which is an Association of Energy Engineers Approved Education Provider and is exclusively online.

The program is offered by LCC and the Northwest Water and Energy Education Institute (NWEETI), which is located within LCC. NWEETI is an organization that is guided by a regional advisory board and has offered energy-efficiency training and professional development opportunities throughout the Northwest region for 30 years. Options in the program include a one-year certificate and a two-year Associate of Applied Science degree. The associate degree program includes general education courses in math, science, health and writing, as well as six elective credits. The program core courses include topics like blueprint reading, Excel for business, residential and commercial energy analysis, sustainability in the built environment, energy-control strategies, energy accounting, lighting fundamentals, alternative-energy technologies and five courses in building automation systems (BAS).

Another requirement of the Energy Management Technician AAS degree is a Cooperative Education: Energy Man-

trial plants, utilities, manufacturing facilities, office buildings, hospitals, schools — including higher education — and at local, state or federal government buildings.

## Education

Due to the highly technical nature of the systems involved in energy management, most technicians need some form of postsecondary training, most often an associate's degree or certificate with a STEM focus. There are programs like these offered by some two-year community and technical colleges.

## Earnings

In this newer career field, exact statistics aren't always available, and Lane Community College Energy Program Coordinator Roger Ebbage notes that, while there is a significant and growing

number of employees in the employment category, there still isn't a specific Classification of Instructional Programs (CIP) code for energy management. He cites mechanical-engineering technicians as the closest, and according to the U.S. Bureau of Labor Statistics *Occupational Outlook Handbook*, the median annual wage in this category was \$56,250 in May 2018, with the highest 10 percent earning more than \$85,430.

## Job Outlook

Research, including that found in the "U.S. Energy and Employment Report" from the Energy Futures Initiative and the National Association of State Energy Officials, concludes that the rapid and ongoing growth of the energy-efficiency industry will mean continued job growth for those with skills and training in the field.

agement course, which is an internship course that offers a work experience that integrates theory and practice in the field of energy management.

Upon successful completion of the program, students will be prepared to enter the workforce with skills that include reading and analyzing building blueprints, evaluating energy-use patterns, making recommendations for energy efficiency and renewable energy solutions, and producing energy-evaluation technical reports. They may also choose to continue their education, because the degree is fully transferable to completion of a bachelor's degree in Sustainable Building Science Technology at South Seattle College in Seattle, Washington.

In August 2018, LCC announced in a press release that students in the Energy Management Technician program would benefit from a \$25,000 annual scholarship fund provided by the Eugene Water and Electrical Board. Students in the LCC program can apply for scholarships for up to \$5,000 for first-year tuition and expenses. Students may also be eligible for three other

scholarships, including resources from the Bonneville Environmental Foundation, the Energy Trust of Oregon, and funding that has been made available from the American Public Power Association's Demonstration of Energy & Efficiency Developments program, which funds research, pilot projects and education to improve the operations and services of public power utilities.

NWEEI cites the importance of the energy-management field in making a positive impact on our precious energy and water resources, and as LCC Energy Program Coordinator Roger Ebbage noted in the press release announcing the scholarship from the Eugene Water and Electrical Board, "There isn't a better time to become involved in commercial-building energy efficiency."

*For more information about Lane Community College and its Energy Management Technician program, visit [www.lanecc.edu](http://www.lanecc.edu).* ■

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## EXPLORE MORE

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

American Public Power Association  
<https://www.publicpower.org>

Association of Energy Engineers  
<https://www.aeecenter.org>

Energy Management Association  
<https://energymgmt.org>

Institute for Energy Management Professionals  
<https://ienmp.org>

Interstate Renewable Energy Council  
<https://irecusa.org>

North American Technician Excellence  
<https://www.natex.org>

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# Tormach Empowers People Who Make Things



## TODAY'S STUDENTS ARE TOMORROW'S MAKERS. TO HELP THIS NEXT GENERATION

of engineers, makers and entrepreneurs, we created partnerships and tools that make learning efficient and boost confidence.

As a result, Tormach is a top choice of high schools, colleges and universities. Let us walk you through a few of the low-barrier entry points we offer to those wanting to advance their skills in CNC.

### TITANS of CNC: Academy

Last year, Tormach collaborated with TITANS of CNC: Academy to offer real-world CNC machining skills for both newbies and experienced manufacturers.

The TITANS of CNC: Academy is the biggest CNC and manufacturing educational program ever created. It's developed thousands of careers due to its relevant educational building blocks, and it's free of charge to all users. Learning modules are geared towards all skill levels, so the TITANS of CNC: Academy is perfect for engineers, designers, machine operators, hobbyists, garage entrepreneurs and manufacturers.

Here are some of the training blocks available at TITANS of CNC: Academy:

**Titan Fundamentals** includes CNC mill and lathe fundamentals, an introduction to G- & M-Code, and base training on Fusion 360, coolant and shop management.

**Titan Building Blocks** focuses on loading the tool library and building 10 parts that can be produced with a Tormach 770M.

Tormach is thrilled to partner with such a fundamentally positive program. Commenting on Tormach, Titan Gilroy, founder of TITANS of CNC, stated, "You could literally buy a legit CNC machine for \$7,000 and up, and then have an Academy on how to design the parts, program the parts and machine the parts."

There are Tormach-specific training modules at TITANS of CNC: Academy, so you really can go from purchase and installation to training, programming and making.

*Get the full scoop at [cnc.tormach.com/titansofcnc-2019](http://cnc.tormach.com/titansofcnc-2019).*

### PathPilot HUB

PathPilot is the brain behind every Tormach CNC mill, lathe and router. It's easy to learn and use, as it works with

any popular CAD/CAM software and conversational programming is intuitive.

PathPilot HUB is a cloud-based, full-featured PathPilot simulator. Signing up and using it is free of charge. By comparison, CNC simulators by competitors generally cost in the range of thousands of dollars each. This cost alone can hamstring a small program, lab or makerspace. But as a learning tool, PathPilot HUB is a full-featured CNC simulator, and it's available to anyone with a web browser and an Internet connection.

Not only does PathPilot HUB knock down a barrier to entry for the CNC student, Tormach owners can use PathPilot HUB to work on real-world, machinable CNC programs when away from the machine shop. They can trial G-code from an iPad, Chromebook, laptop or desktop instead of taking up time on the shop floor. Once they prove out G-Code program in the simulator, users can download it from the PathPilot HUB web interface and run it on a real machine.

*Sign up and try PathPilot HUB at [hub.pathpilot.com](http://hub.pathpilot.com).*

### Tormach xsTECH CNC router

With the launch of the world's only desktop CNC router to run on PathPilot, Tormach



# TORMACH®

offers an easier way to gain experience and CNC fundamentals. The xsTECH is small, safe, approachable and intuitive to use.

The ability to cut woods and plastics as well as engrave aluminum means the xsTECH is useful, too. It's a perfect starting point for a machining education and a powerful asset for a school or a robotics team.

The xsTECH CNC router is available for purchase, ready-to-run at \$3,495, which means it's within the budget of many school districts who are looking to ramp up CNC training or build out a makerspace or fab lab.

Find out more at [tormach.com/machines/routers/xstech-router](http://tormach.com/machines/routers/xstech-router).

## YouTube

Get a glimpse behind the curtain at Tormach with CNC trends, machining techniques, customer stories, industry events and more at our YouTube channel. And while you're at it, explore content from Tormach-

community creators like John Saunders, the Hacksmith and Giaco Whatever.

Learn about entrepreneurship from bootstrappers who are building their dreams, or sit back and watch chips fly in slow motion. We've built a channel with a wide audience of makers who share a passion for CNC and what it can do to improve lives.

Check out hundreds of videos at [youtube.com/tormachllc](http://youtube.com/tormachllc). ■





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# EVENTS CALENDAR



**Credential Summit**

**SEPT. 30–OCT. 1**

**MYRTLE BEACH, SOUTH CAROLINA**

[acteonline.org/credential-summit-2020](http://acteonline.org/credential-summit-2020)



**Leadership Conference**

**OCT. 1–3**

**MYRTLE BEACH, SOUTH CAROLINA**

[acteonline.org/region-ii-event](http://acteonline.org/region-ii-event)



**Best Practices and Innovations  
in CTE Conference**

**OCT. 7–9**

**CAPE COD, NORTH FALMOUTH,  
MASSACHUSETTS**

[acteonline.org/bestpractices](http://acteonline.org/bestpractices)



**ACTE's CareerTech VISION**

**DEC. 2–5**

**NASHVILLE, TENNESSEE**

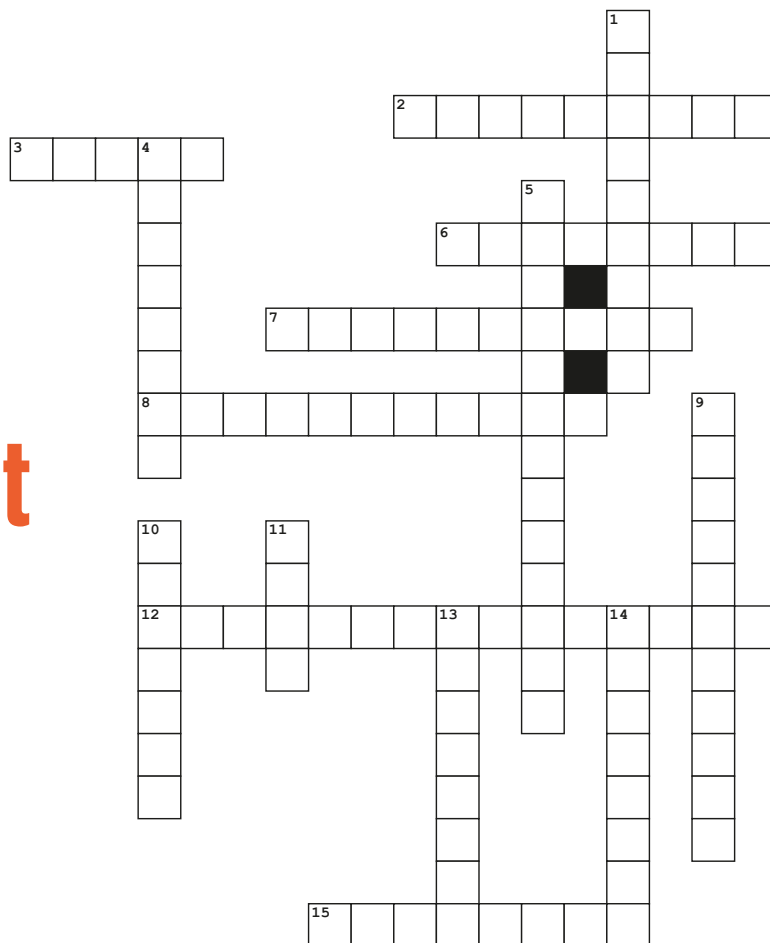
[CAREERTECHVISION.COM](http://CAREERTECHVISION.COM)



***Please check [acteonline.org](http://acteonline.org) for the latest event information.***



# Professional Development



## Across

2. \_\_\_\_\_ Design for Learning (UDL), by contrast, starts by acknowledging variability; in fact, it is based first and foremost on the assumption that each learner brings their own strengths, needs and interests into the classroom.
3. Our district elicits \_\_\_\_\_ (specific, measurable, achievable, relevant, time-bound) goals from every teacher each year.
6. Nationwide, the teaching profession is witnessing a severe and very concerning teacher \_\_\_\_\_.
7. When students are engaged, they are less likely to be \_\_\_\_\_.
8. A \_\_\_\_\_ annual plan for professional development can help ensure that a variety of relevant content is covered and may extend to professional development plans for individual staff members.
12. For most teachers who leave the teaching profession voluntarily, some type of \_\_\_\_\_ influenced their decision (Sutcher et al., 2016).
15. The shortage of credentialed CTE teachers also jeopardizes the development of new \_\_\_\_\_ and the sustainability of existing \_\_\_\_\_, as districts simply cannot find qualified industry professionals.

## Down

1. When there is a group of students lagging behind, this might be a good time to visit the idea of \_\_\_\_\_ assessment and the impact that it has on improving classroom achievement.
4. Coding and \_\_\_\_\_ programs are great ways to engage bored or checked-out students, but they also offer significant potential for learning outcomes across the curriculum.
5. Due to the highly technical nature of the systems involved in energy management, most technicians need some form of \_\_\_\_\_ training.
9. A lack of \_\_\_\_\_ training does not disqualify someone from being a highly effective instructor.
10. As you prepare to write your next professional development plan (or even a goal within it), allow yourself the time to identify your \_\_\_\_\_, and brainstorm the ideas you have.
11. \_\_\_\_\_ Institutes provide teachers with 50 to 100 hours of hands-on instruction related to a specific yearlong \_\_\_\_\_ course.
13. It is common for individuals who want to create IDPs to focus on their areas of need rather than identify their areas of \_\_\_\_\_.
14. Developing sustainable career pathways is the key to meeting workforce needs, but administrators in the Los Angeles region have growing concerns about more effective ways to recruit and retain qualified career and technical education (CTE) \_\_\_\_\_.

ACTE's CareerTech

# VISION

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**Kevin J. Fleming**

Vice President, Norco College  
Best-selling Author

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- ▶ **Career Pavilion** providing essential resources on several CTE career pathways
- ▶ **Wednesday workshops and tours** offering insights into focused topics and CTE programming
- ▶ **The ACTE Excellence Awards Gala**, a heartwarming gathering of passionate CTE professionals and supporters

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 Rate: \$198 plus taxes & fees  
 Hotel phone: 615-889-1000

Note: The hotel booking link will be included with your VISION registration confirmation.

Visit [careertechvision.com/travel.cfm](http://careertechvision.com/travel.cfm) for additional travel information.

## Early Bird Registration is Open!

Register by July 10 to secure the most affordable way to attend VISION!

### VISION and CareerTech Expo

	Early Bird (by 7/10)	Advance (7/11-10/23)	Regular (after 10/23)
ACTE Member	\$395	\$445	\$525
Non-member	\$585	\$645	\$695

### ACTE Awards Gala

	\$80	\$80	\$80
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### Special Combo Rate: CareerTechVISION, Expo & Awards Gala (save \$10)

ACTE Member	\$465	\$515	\$595
Non-member	\$655	\$715	\$765

	\$80	\$80	\$80
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**GROUP DISCOUNTS** for full VISION event rates — Receive 10% off when you register 10 or more individuals from the same institution.

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