



HIGH-QUALITY CTE DURING COVID-19: Challenges and Innovations



Dear CTE Family,

To say this year has been challenging would be an understatement — there really are no words to express the upheaval that has been felt across all of the systems that impact our lives. Education has certainly had its share of these challenges, and many of the experiences that are fundamental to CTE, such as hands-on learning, lab work, work-based learning and industry credentials, have been exponentially difficult this year.

While we know this year has not been easy, we also know that the innovation, creativity and resilience of the CTE community has led to incredible things we did not think were possible a year ago. Examples of your innovation as CTE professionals are highlighted throughout this report, from harnessing virtual learning tools and engagement platforms to developing kits of equipment and supplies for at-home use to facilitating in-person learning while maintaining safety.

Throughout the year, ACTE has worked to support you in a variety of ways:

- We quickly developed a series of webinars in spring 2020 to address the remote teaching needs of our discipline-specific ACTE Divisions.
- We published our [High-quality CTE: Planning for a COVID-19-impacted School Year](#) guide and hosted an accompanying webinar series to help CTE professionals identify considerations, guiding questions and emerging best practices for the current school year.
- We made access to online teaching courses on our [CTE Learn](#) platform free for several months in 2020. CTE Learn offers continuing-education credit courses and free resources, such as [discussion boards](#), for secondary and postsecondary CTE professionals. Participation on the platform increased by 7,227 new users between April 1 and the end of December 2020.
- We shared [distance learning resources](#), such as a series of newsletters featuring CTE program-area-specific resources, developed in collaboration with the California Department of Education's Career and College Transition Division, CTEOnline.org and the San Diego County Office of Education's Office of College and Career Readiness.
- We went virtual with our annual conference. ACTE's [CareerTech Virtual VISION 2020](#) connected an audience of almost 3,000 for a week of high-quality CTE professional development and virtual networking.
- We advocated for federal funding and flexibility to help CTE educators respond to the pandemic, resulting in unprecedented federal investments in both secondary and postsecondary education.

We hope this report will provide an informative analysis of some of the challenges and successes that CTE programs faced during the COVID-19 pandemic as well as insights to help you continue to improve your programs and services to students. ACTE will continue to provide relevant CTE professional development, resources and research as we navigate these changing circumstances and to advocate for the funding, supports and resources you need to succeed.



LeAnn Wilson
Executive Director, ACTE



Doug Major
President, ACTE

TABLE OF CONTENTS

Executive Summary	3
Introduction	5
CTE Delivery Methods During COVID-19	5
Fall 2020	5
January 2021	6
Program delivery examples	6
Funding, Enrollment and Staffing Changes	7
Enrollment changes in 2020-21	7
Funding changes in 2020-21	8
Staffing changes in 2020-21	9
Outlook for 2021-22	9
Biggest Challenges for CTE During COVID-19	10
Motivating and engaging learners	11
Providing hands-on learning and lab hours	12
Providing work-based learning experiences	14
Preparing learners for industry certifications and other performance assessments	15
Accessing the internet and online technology tools	18
Supporting special and underserved populations	18
Accessibility and Universal Design for Learning	19
Learners with disabilities	19
Underrepresented and nontraditional learners	20
Career, Social and Emotional Development	21
Career counseling and advising	21
Social and emotional learning	21
Professional Development	23
Professional development experiences in 2020-21	23
Professional development priorities	24
Progressing Past the Pandemic	25
Economic outlook	25
CTE outlook	26
Recommendations for CTE in a Post-COVID-19 World	27

EXECUTIVE SUMMARY

Career and technical education (CTE) has faced, and often surmounted, many challenges during the COVID-19 pandemic. In response to surveys fielded to ACTE members in January and February 2021, CTE professionals — including CTE teachers, faculty, administrators, school counselors, career development professionals and other dedicated staff — report that the biggest challenges they are facing during the 2020-21 school year are motivating and engaging learners and providing hands-on learning and lab hours. Providing work-based learning experiences and preparing students for industry certifications and other performance assessments are also significant challenges. Additionally, about one-fifth of CTE professionals identified internet/technology access and supporting special and underserved populations as major issues.

In addition to these delivery challenges, CTE administrators report significant enrollment declines in many CTE programs and programs of study this school year. Going forward, early indicators point to a mixed outlook for enrollments as well as possible funding declines and CTE instructor shortages in the years to come.

Yet, while COVID-19 has created challenges, the pandemic has also created opportunities for experimentation and innovation in delivery of CTE programs and programs of study. This report describes many innovative practices in CTE from the past year, including but not limited to the following:

- The outdoor CTE classroom at Rockbridge County High School in Lexington, Virginia, enabled students to complete performance assessments and check off competencies in an open-air, socially distanced setup.
- CTE theatre instructor Felicia Latoya Brown at Trenton Central High School in Trenton, New Jersey, prepared a Theatre-in-a-Box so that students could put on virtual productions at home.
- CTE students across Nassau County School District in Florida designed and executed a mask-wearing campaign.
- YouthForce Internship, a project of New Orleans-based YouthForce NOLA, developed virtual “consultancies” in which students worked together to solve a business problem identified by an employer.
- Adult nursing students at Assabet Valley Regional Technical School in Marlborough, Massachusetts, are gaining experience and earning clinical hours by administering COVID-19 vaccines.
- Kansas DECA is organizing virtual challenges to continue to develop students’ technical, employability and leadership skills.
- High school students at the Teacher Academy of Renton School District 403 in Renton, Washington, have been working remotely one-on-one with elementary students who need extra emotional or academic support.

As COVID-19 moves into a new phase, CTE educators are considering how lessons learned from this past year can support teaching and learning that is more equitable, more flexible, more diverse in its delivery and more focused on competencies in order to meet an anticipated [surge in demand](#) for CTE programs that prepare youth and adults with the skills and credentials needed in the post-pandemic workforce.

To help CTE better prepare the post-COVID-19 workforce and embrace lessons learned from the past year, ACTE recommends that CTE leaders pursue the following recommendations, which are further elaborated at the end of this report:

- **Reassess labor market alignment:** CTE will play an important role in recalibrating education for the post-COVID-19 workforce. Skill seekers are increasingly drawn to CTE programs, but this value is based on the labor market relevance of particular programs of study and resulting credentials. Where local and regional economies have shifted, CTE leaders must realign their programs of study to respond to these pandemic-related changes as well as to the long-term shifts toward remote work and automation that the virus accelerated.
- **Skill and reskill the workforce:** CTE will be on the front lines of preparing youth and adults for the workforce that emerges in the wake of COVID-19. To best support the post-pandemic workforce, CTE leaders must continue to provide more flexible, student-centered pathways for learners to develop the knowledge and skills necessary for high-wage, high-skill, and in-demand and emerging occupations — particularly for adult workers who have been displaced during the pandemic. This skilling and reskilling should focus on not only technical and academic skills but also employability skills needed in modern, technology-enabled workplaces.
- **Commit to equity:** Another important task is confronting inequities in education more generally and in CTE specifically, particularly those that have been spotlighted or exacerbated by the pandemic. CTE leaders must commit to early career exploration that exposes students to

pathways and careers they may not have considered. In addition, CTE professionals must consider how to help current students recover from learning losses and assist current and future learners to get back on track with their education and career pathways, especially individuals from low-income, minority and special population groups who have been most negatively impacted by COVID-19.

- **Embrace innovative tools and delivery models:** Many, if not most, CTE programs will continue to offer in-person learning to best enable students to develop and practice their skills in authentic environments. However, online and blended learning, mobile learning and tools like augmented reality/virtual reality simulations can be thoughtfully and carefully leveraged to engage students and provide them with multiple options for learning and achieving their goals.
- **Develop and support CTE professionals:** Many CTE instructors, faculty, administrators, school counselors, career development professionals and other staff members have struggled this past year. Among education programs, CTE — with its hands-on focus — has been one of the most difficult to quickly pivot to remote and blended learning. CTE educators have borne the brunt of this challenge and will need time, support and professional development to recover and reflect on lessons learned this past year. In addition, educators coming into the profession will need training that addresses new delivery modes and technologies as well as inequities illuminated by the pandemic.
- **Advocate for CTE:** Now is the time for CTE leaders and education and workforce development organizations to step up their advocacy for policies that support CTE quality, access and equity and emphasize CTE's important role in the country's recovery. Institutions, systems and states with strained budgets may not prioritize investment in CTE programs. This would be the wrong move: Data shows that learners are very interested in CTE programs that deliver skills and relevant credentials for the post-pandemic workforce. But delivering on this potential will require investment and cross-system changes.

INTRODUCTION

It's been just over one year since COVID-19 first led to significant closures in the U.S. economy and the shuttering of campuses across the nation. Since then, many career and technical education (CTE) programs and educators have been riding a rollercoaster of evolving recommendations from state, local and national health experts; changing modes of education delivery; and personal, family and community concerns.

While no one wanted to be in this situation, it has forced opportunities for experimentation and innovation in delivery of CTE programs and programs of study, from virtual industry engagement to take-home kits for hands-on practice to opportunities for CTE learners to help those in need during the pandemic. As we begin a process of recovery, CTE educators are considering how lessons learned from this past year can support teaching and learning that is more equitable, more flexible, more diverse in its delivery and more focused on competencies.

In addition, CTE will have an important role to play in economic recovery and developing the post-pandemic workforce. This includes not only providing the education, training and reskilling opportunities that youth and adults will need for high-wage, high-skill and in-demand occupations and industries, but also helping learners develop the technical, employability and academic skills that are important for increasingly technology-focused workplaces.

Research Methods

Much of the content in this report is based on results from two ACTE surveys. The first was directed to the entire ACTE membership in January 2021. It generated 649 responses. Most respondents were CTE instructors (65%), followed by CTE administrators (21%). In addition, the majority of respondents were CTE professionals from secondary schools (64%) and area career technical centers/other shared-time centers (23%).

A second survey was sent to members of ACTE's Administration Division in February 2021 to gather more information about funding and enrollment changes in the current school year. This survey generated 297 responses from CTE administrators. Again, the majority of respondents to this survey were from secondary schools and area career technical centers/other shared-time centers. Around 6–7% of respondents to each survey were from the postsecondary sector.

Statistically significant differences in responses among groups – for instance, responses from secondary CTE educators compared to postsecondary CTE educators, urban CTE educators compared to rural CTE educators, or CTE educators teaching all or mostly in-person compared to CTE educators teaching all or mostly remote – are noted throughout the analysis. Additional information on survey methods is included in the addendum.

These survey responses are supplemented by information from industry groups, other education organizations and researchers; innovative practices during COVID-19 submitted to ACTE from our members; and media reports.

CTE DELIVERY METHODS DURING COVID-19

CTE professionals — including CTE teachers, faculty, administrators, school counselors, career development professionals and other staff — are utilizing a variety of delivery methods to educate learners during COVID-19, including all or mostly remote models; all or mostly in-person models; and hybrid or blended models, such as simultaneously teaching some students at home while others are on campus and/or bringing rotating groups of students to campus. In most cases, these delivery decisions are not up to CTE educators but are the downstream result of state, district, or institutional decisions and are reflective of the different impacts the pandemic has had on communities across the country.

Fall 2020

In fall 2020, CTE professionals delivered programs and programs of study through a variety of methods. Blended options that paired remote and in-person learning were the most common delivery methods, while the least common method was mostly remote learning with exceptions, such as in-person lab hours. Survey respondents described switching between delivery methods over the course of the fall, as case rates rose and fell or as campuses closed for virus breakouts.

Geographic differences emerged as well. City and suburban respondents were more likely to engage in remote learning

in fall 2020 than small town and rural educators, which aligns with other data sources on [public school reopening](#) in fall.

January 2021

In January 2021, CTE professionals returned from the winter break to a wide variety of delivery methods. However, in contrast to the fall, slightly more respondents reported beginning the new semester with in-person learning. Blended options remained common though, and anecdotal reports indicate that fluctuation in delivery models is still occurring often as case numbers rise and fall in local communities. As with fall 2020, differences are apparent across geography: Rural and small-town respondents were more likely to be starting in-person in January 2021 than city and suburban respondents.

Additionally, in contrast to their peers at secondary schools, postsecondary CTE educators are more likely to be teaching remotely but bringing learners to campus to complete labs or access extra supports. This aligns with reports that K-12 districts are reopening campuses, as documented by [FutureEd](#), [EdWeek](#) and [U.S. News & World Report](#), while the [American Council on Education](#) reports that postsecondary institutions are choosing mostly remote learning, with some on-campus time, for the spring semester.

Program delivery examples

In practice, these remote, blended and socially distanced in-person learning environments translate to highly varied modifications in schools, classrooms and labs:

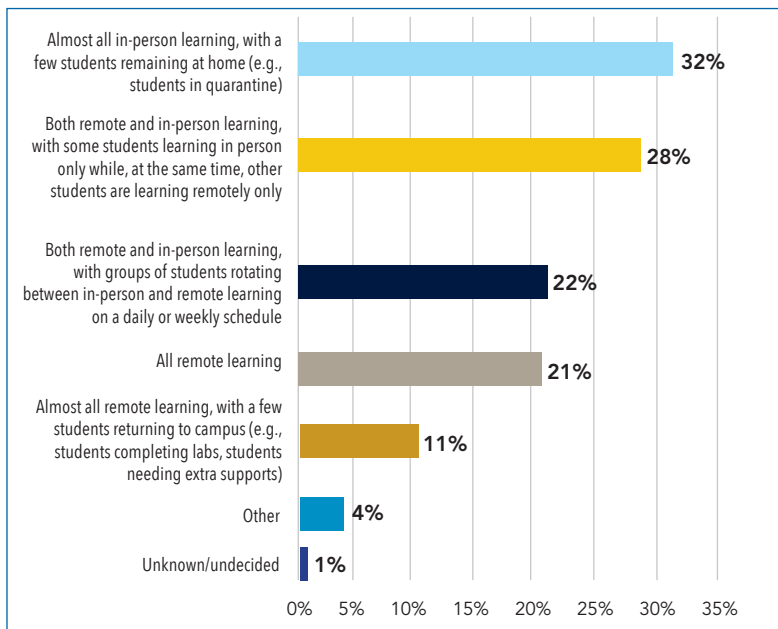


Chart 1: Methods of in-person, blended and/or remote learning in January 2021. 649 CTE professionals responded to this question. Respondents could pick multiple options.

- This fall, at [Greene County Technical Education Center](#), an area career and technical center in Stanardsville, Virginia, students who were learning in a remote or blended environment at their home high school were able to take in-person CTE classes at the tech center two days per week. Students went through health screening when they arrived on campus for the day and followed safety precautions. For example, in the heating, ventilation and air conditioning (HVAC) class, students in small class sizes wore masks and worked spaced from each other and their teacher, as reported by the *Greene County Record*.
- At the [Agricultural Science and Technology Education program at Rockville High School](#) in Connecticut, a majority of students have been attending in-person two days a week, according to the *Journal Inquirer*. This reduces the amount of time that learners spend in labs and hands-on activities from two days to just one day per week. For safety, learners are alternating between lab stations or using materials such as gloves and safety glasses that are assigned to each person. In addition, about 20% of learners are participating virtually, supplemented by take-home kits if appropriate for the course or unit (e.g. floral design, yes; welding, no).
- This fall, at the culinary arts program at [Cerritos College](#) in Norwalk, California, the kitchen that previously fit 84 students now accommodates 20 with social distancing. Rather than a row of mixers in the back, each learner now has their own fully equipped station topped with a hood ventilation system that cycles in fresh air from the outside. Students wear gloves, masks and face shields. Vendors now leave deliveries at the loading dock, and college staff puts everything but frozen foods into a hydrogen peroxide bath to sanitize, as reported by CalMatters.
- For the computer science, IT and cybersecurity programs at [Troy High School](#) in Fullerton, California, almost all students have chosen to remain remote. Instructor Allen Stubblefield is teaching simultaneously to remote and in-person students, using live and prerecorded media to teach concepts and demonstrate computer hardware. Virtual meeting software is used for student group work and to enable industry representatives to speak to the class.
- At [Laramie County Community College](#) (LCCC) in Cheyenne, Wyoming, the welding lab was already comprised of individual bays that facilitate social distancing. One of these bays is now equipped with a heat-resistant camera that shows the weld and another camera above the bay that shows the student's positioning. These cameras are linked to a large screen for the instructor to see, assess and correct both the weld and the student's physical movements. The college also accelerated its planned transition to a dual

delivery model in some programs, offering two versions of the same course, one entirely online and one entirely in-person. This allows for social distancing in the in-person course and, if a learner has to quarantine, they can switch seamlessly to the online version. Similarly, if a student is struggling in the online course, they can switch to in-person learning.



LCCC welding student Tia Stephenson works under the eye of a new Xiris welding camera. Photo courtesy of LCCC.

FUNDING, ENROLLMENT AND STAFFING CHANGES

One of the biggest unknowns of the 2020-21 school year has been the impact of COVID-19 on CTE program funding, enrollment and staffing. While a full reckoning of the impacts of this school year on CTE programs will take more time to assess, ACTE survey results show potential early trends.

The following information is based on responses from CTE administrators to both the general ACTE member survey and the ACTE Administration Division survey. In both cases, more responses came from administrators, department heads and district leaders from the secondary level than the postsecondary level. As such, this information should be taken as more representative of what is happening in the K-12 space than the postsecondary space.

Enrollment changes in 2020-21

Student enrollment has been substantially impacted this year, with almost 60% of CTE administrators citing lower enrollment in their CTE programs, about one-third reporting steady enrollment and only 8% reporting an enrollment increase. While many variations exist, in general, CTE administrators have shared that program enrollment is down across CTE program areas and across secondary and postsecondary learner levels.

When asked which CTE programs of study experienced the most significant enrollment decreases this school year, CTE leaders gave varied responses. However, automotive and diesel programs; manufacturing, machining and welding programs; construction and building trades programs; and culinary and hospitality programs were reported most frequently as the subject areas experiencing significant declines. The outlook for health sciences was mixed, with some CTE administrators reporting declines and others citing increases in enrollment; data from the

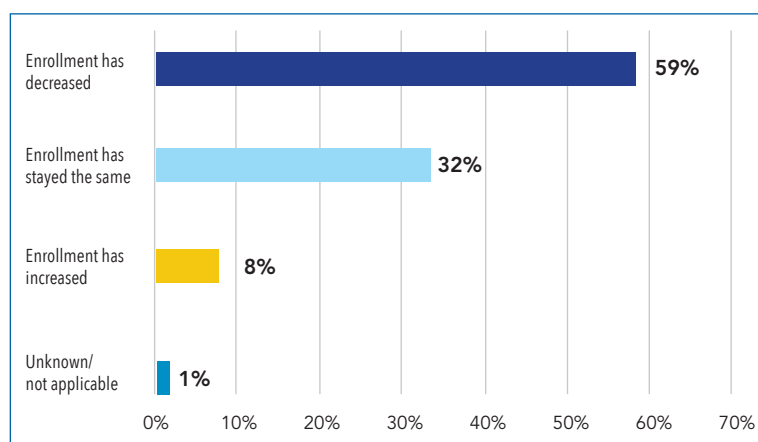


Chart 2: Change in CTE enrollment in the 2020-21 school year. 156 CTE administrators responded to this question.

[EdWeek Research Center](#) points to increased student interest in health careers since the pandemic started.

Anecdotally, CTE leaders report that enrollment declines are due to a mixture of pandemic-related factors: cross-district or -institution enrollment drops that have trickled down to CTE programs; decreased student interest in and motivation for traditionally hands-on courses during remote or blended delivery; programming decisions to cap enrollment or temporarily defer offering certain CTE courses; scheduling and transportation challenges (a particular issue for shared-time career and technical centers); and instructor retirements, among others.

Indeed, overall enrollment decreases are apparent across secondary and postsecondary sectors. For example, in [K-12 education](#), this includes 16,000 fewer students in Miami-Dade County and exponential declines in Dallas Independent School District, as well as more than 53,000

fewer students in [Michigan](#). For fall 2020, [Minnesota](#) reports a decline of 2% in public school enrollment, an increase of 0.7% in private school enrollment and a 50% increase in homeschooled students. Nationally, 9% of parents who hadn't previously [homeschooled](#) their children were planning to do so for at least part of the current school year.

On the postsecondary level, while economic recessions often lead to a postsecondary education boom, concerns about virus transmission and the quality of remote education have had the opposite effect. [Fall 2020 enrollment](#) declined across institutions, with [immediate college enrollment rates](#) particularly down for graduates of high-poverty, low-income and urban high schools.

The largest drop in postsecondary enrollment is happening at two-year public institutions, with a 10% decline on average. Declining enrollments in the two-year sector have also been reported by the majority of two-year [college presidents](#). In addition, the [Community College Research Center](#) found that in more than 40% of households with at least one individual who had planned on attending community college in fall 2020, those individuals had canceled their plans, and another 15% were taking fewer classes or changing programs.

These enrollment impacts have equity implications: Low-income and economically insecure learners were much more likely to have cancelled their community college attendance plans for fall 2020, as were learners of color, according to the [Community College Research Center](#).

Funding changes in 2020-21

Many CTE administrators report that their traditional funding sources, including state, local and private sources of funding such as philanthropic grants, saw no significant change this year. However, 22% report a major decrease in private funding, 16% report a significant decrease in state funding and 15% report a significant decrease in local funding.

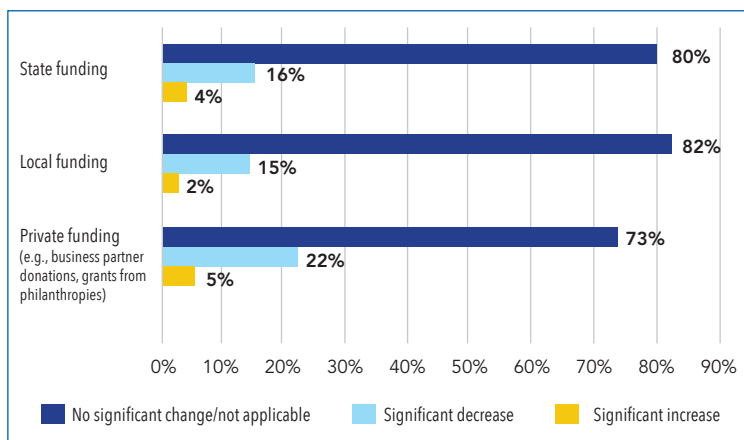


Chart 3: Changes in state, local and private CTE funding in the 2020-21 school year. 233 CTE administrators responded to this question.

Federal COVID-19 relief funding, such as Coronavirus Aid, Relief, and Economic Security (CARES) Act funds, has had a positive impact on CTE programs for the 2020-21 school year, with 47% of CTE administrators reporting that they received funds from this source. According to some CTE administrators in our survey, federal relief funding made up for decreases from other sources, including declines owing to cancellations of events like career and technical student organization (CTSO) fundraisers.

CARES Act funding received in 2020 allowed for uses such as providing PPE and sanitizing facilities and equipment, purchasing remote and blended hardware and software, addressing student learning loss, providing mental health services and preparing faculty and staff to carry out all of the above. In addition, some states directed portions of the CARES Act [Governor Emergency Education Relief Fund](#) to CTE specifically, including [Maryland](#), [Pennsylvania](#) and [Florida](#).

State CTE policies from 2020 show a similar mix of funding impacts during the pandemic, including 14 states that increased funding for CTE in the last calendar year, eight states that decreased funding and two states that increased funding for some CTE programs and decreased funding for others. Pandemic-related investments include \$88.3 million in Vermont to school districts and regional career technical center school districts for COVID-19-related costs and \$2.3 million to Vermont state colleges to provide training for displaced workers. In funding declines, some of the largest cuts for CTE came in Alabama (\$3 million cut to the state Department of Education), California (\$8.5 million less for the community college system), Colorado (\$8 million cut to area technical colleges), Oklahoma (\$5.5 million less for the Department of Career and Technology Education) and Tennessee (\$7.8 million less for the Division of College, Career and Technical Education).

In fact, while the financial impact of the pandemic has been highly variable across states and counties, the overall effect of the pandemic on education funding has been [less severe](#) than expected. As noted, secondary and postsecondary districts and institutions benefited from CARES Act funding for a variety of COVID-19-related expenses. Additional relief was also provided by Congress through the Coronavirus Response and Relief Supplemental Appropriations Act in December 2020 and the recently passed American Rescue Plan, so more federal dollars are now available and may help to prevent long-term funding consequences.

Staffing changes in 2020-21

The majority of CTE administrators report that the number of CTE instructors they oversee has remained the same, with 12% reporting fewer instructors and 5% reporting more.

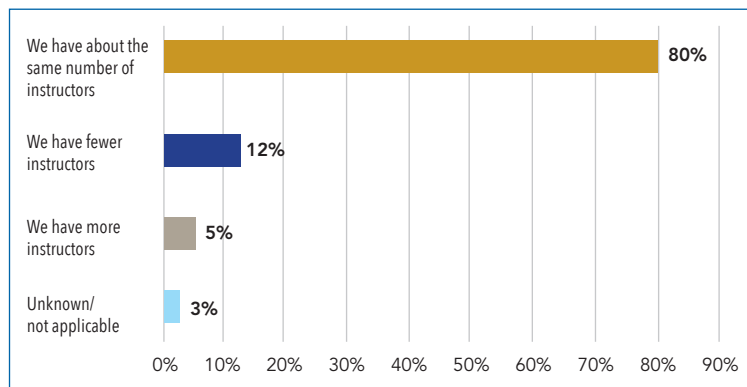


Chart 4: Change in number of CTE instructors in the 2020-21 school year. 156 CTE administrators responded to this question.

However, while staffing levels have remained relatively unchanged, survey respondents from across the ACTE membership described their stress about the impact of continued remote learning, their fatigue, and their concerns about their own health and the health of their students. The challenges exist across delivery methods, from the fatigue that teachers feel after hours of online teaching (sometimes also supervising their own children) to increased workloads for preparing lessons for both in-person and remote learners to the stress of monitoring student adherence to COVID-19 safety guidelines.

CTE educators are not alone in reporting that teaching this year has taken a tremendous toll. The [National Education Association](#) reports that more than one-quarter of teachers across discipline areas and learner levels said the coronavirus had made them more likely to leave teaching or retire early, including 55% of veteran teachers and 43% of Black teachers. In addition, 55% of faculty at [higher education institutions](#) have seriously considered either changing careers or retiring early, citing pandemic burnout.

Outlook for 2021-22

Beyond this current school year, early indicators point to a mixed outlook for enrollments as well as funding declines and possible instructor shortages.

While the appeal of free public education and the difficulty of homeschooling or full-time virtual school will likely draw most students back to K-12 schools, across the postsecondary system, signs point to depressed enrollment and completion for the next couple of years. Fewer students

are currently completing their [FAFSA](#) forms for financial aid, particularly low-income learners and students of color. About 20% of community college students expect to [delay their graduation](#) because of COVID-19, and about one-quarter of fall 2020 high school seniors report that their [postsecondary plans have changed](#) since the pandemic—30% for students of color.

Enrollment declines in the current school year and projected postsecondary declines for the 2021-22 school year will likely lead to funding cuts in school districts and postsecondary systems that base funding on enrollment. In addition, many, though not all, states project [revenue shortfalls](#) for the coming school year, which could translate into a roughly 10% cut in state education funding next year, according to analyst [Rebecca Sibilia](#). In addition, Minnesota and Pennsylvania have reported large increases in teachers applying for retirement benefits, according to [The New York Times](#). These challenges come just when education programs most need to invest in supporting learners, closing gaps, and hiring and retaining qualified teachers. However, these projections predate the recently passed American Rescue Plan. As of writing, it is too early to tell the impact that state and local funding included in this legislation will have on education budgets.

CTE programs will be operating in this difficult context. In addition, CTE leaders have shared CTE-specific enrollment concerns for the coming year. Anecdotally, CTE administrators predict that students who struggled this year will be repeating core academic courses in the 2021-22 school year, reducing their opportunities to take part in CTE. Administrators have also raised concerns about students who flocked to introductory courses for certain pathways owing to pandemic-related schedule and delivery changes. This has led to temporary enrollment increases in these program areas, but these students may be less likely to complete the pathways that they've started.

In addition, some CTE leaders are concerned with upcoming staffing shortages. Some CTE administrators have reported instructors quitting in 2021 because they were no longer able to deal with the stress and burn-out of teaching in a COVID-19-impacted school year. For instance, CTE leaders in Indiana are expecting a large exit of CTE teachers from the profession in that state at the end of the school year.

While there are many issues to concern CTE educators in the coming year, there is a potential bright spot: Learner, employer and policymaker interest in CTE to revitalize the economy and develop the post-pandemic workforce could lead to increased investments, mitigating these concerns. We will address this topic more in the Progressing Past the Pandemic section.

ACTE'S HIGH-QUALITY CTE ELEMENTS

To address the challenges created or exacerbated by the pandemic – as well as the routine challenges CTE educators face each year providing a wide array of technical, academic and employability content along with work-based learning, career and technical student organizations and other experiences – ACTE uses its evidence-based [Quality CTE Program of Study Framework](#) to help CTE programs assess and improve and to structure the association's professional learning and recognition activities.

The Framework includes more than 90 criteria across 12 elements that address the depth and breadth of knowledge, skills and experiences that CTE programs of study offer, as well as related system supports:

-  Standards-aligned and Integrated Curriculum
-  Sequencing and Articulation
-  Student Assessment
-  Prepared and Effective Program Staff
-  Engaging Instruction
-  Access and Equity
-  Facilities, Equipment, Technology and Materials
-  Business and Community Partnerships
-  Student Career Development
-  Career and Technical Student Organizations
-  Work-based Learning
-  Data and Program Improvement

Readers will find high-quality CTE element icons throughout this paper to indicate where programs are addressing these issues.

BIGGEST CHALLENGES FOR CTE DURING COVID-19

The biggest challenges CTE professionals are facing in the 2020-21 school year are motivating and engaging learners and providing hands-on learning and lab hours. Providing work-based learning experiences and preparing students for industry certifications and other performance assessments are also significant challenges. And while internet/technology access and supporting special and underserved populations were lower down the list, about one-fifth of survey respondents still identified these areas as major issues.

Not surprisingly, compared to educators who are teaching remotely, educators who are teaching in person report being more effective in regard to motivating and engaging learners, providing hands-on learning and labs hours, preparing students for industry certifications and other

performance assessments, and supporting special and underserved populations.

These findings align with other data sources, including survey data from [Associated Equipment Distributors](#) (AED) of primarily postsecondary educators of heavy equipment and diesel technology, who also rated student engagement as the greatest challenge, followed by providing students enough opportunities for hands-on work. Similarly, a survey of computer science teachers from the [Kapor Center and the Computer Science Teachers Association](#) addressed concerns about student engagement, equity gaps in virtual learning and the de-prioritization of non-core courses. [School counselors](#) also found it challenging to reach students and provide counseling and lessons in the

virtual environment, as well as to handle high caseloads and work to close equity gaps. A forthcoming publication by researchers from Idaho, Illinois, Kansas, North Carolina, North Dakota, Oklahoma and Pennsylvania will further dive into program-area-specific challenges that CTE teachers and students faced during 2020 campus closures.

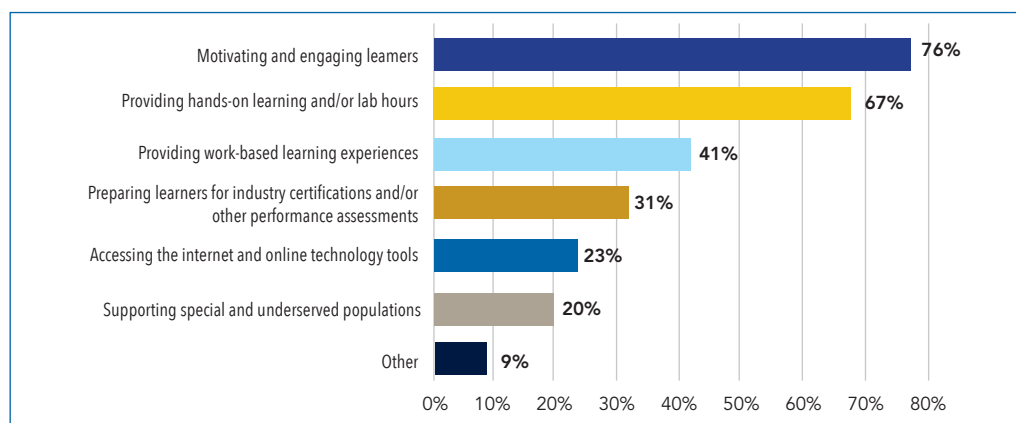


Chart 5: Biggest challenges in the 2020-21 school year. 649 CTE professionals responded to this question. Respondents could pick up to three options.

Motivating and engaging learners

High-quality CTE programs of study are known for student-centered learning that contextualizes academic and technical knowledge and skills within real-world scenarios and helps learners connect the dots between what happens in the classroom, laboratory or work site — whether virtual or in person — and their future education and career plans.

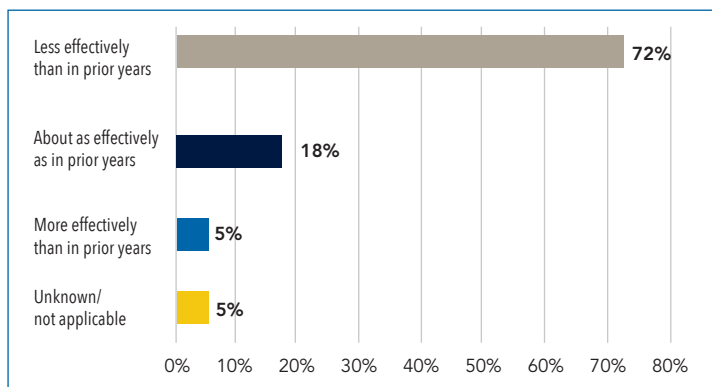


Chart 6: Effectiveness at motivating and engaging students in the 2020-21 school year, compared to prior years. 649 CTE professionals responded to this question.

For this reason, it is unsurprising that almost three-quarters of CTE professionals report being less effective at motivating and engaging learners compared to prior years. This includes difficulties with remote attendance, struggles getting students to talk and respond in remote learning environments, and issues gauging comprehension remotely and with mask wearing.

This challenge is a significant one that holds across differences in geography, years of teaching experience and other respondent characteristics, although postsecondary CTE faculty are not struggling quite as much as their secondary peers. This is likely because the [postsecondary sector](#) had more widely embraced virtual and blended learning even before the pandemic and had more experience with these modes of delivery.

CTE instructors have responded to this challenge in a variety of ways. Many teachers are incorporating virtual instructional strategies that involve gameplay or give students options, such as developing choice boards, hosting trivia or mock gameshows, or embedding polls and question-and-answer sessions throughout virtual lessons. For instance, Sarah McCance of [Fountain Valley High School](#) in Fountain Valley, California, is using games, along with interactive tools and ample communication, for her Virtual Enterprise course. McCance has amped up the fun for her students with [Kahoot!](#) games, virtual dance parties, virtual scavenger hunts and virtual karaoke. She also keeps the

lines of communication open, sharing the most important course information with students orally during Zoom lessons as well as posting information online, and encourages frequent communication among students through chat features and separate student Zoom meetings. McCance particularly appreciates the tool [Nearpod](#) and anticipates that she'll keep using it in the future to make lessons more interactive, encourage participation and feedback, and check for understanding.

Still other instructors have embraced their dramatic sides, using roleplaying, costumes or virtual filters to add an element of fun and hold student interest. [Three woodworking teachers](#) from three high schools in Salem, Oregon, combined their classes into one remote experience in fall 2020, according to the *Salem Reporter*. This team approach has enabled one teacher to demonstrate a task while another runs the camera and the third answers questions. It also allows for playful interaction, like when instructor Michelle Zielinski dressed up as a client hiring the students to create a new kitchen, or when instructor Andrew Chidwick reminded students about the need to complete assignments using classic horror movie visuals.

Some instructors have used the blended delivery model to “flip” their classroom. For instance, in the [Graphic Communications Technology](#) program at Calhoun Area Career Center in Battle Creek, Michigan, the class has been divided into two cohorts that rotate between in-person and remote learning. When students enter the lab on in-person days, they have already watched virtual instruction, reviewed prior content, and asked and answered questions. That leaves them free to work independently on practical assignments and projects, while instructor Heidi LaGrow monitors and facilitates their learning.

Last, but not least, CTE instructors are harnessing the real-world challenges of the pandemic to help their communities and give students a feeling of agency in a difficult situation. There are countless examples of this throughout the pandemic. For instance, students at [Freehold High School](#) in Freehold, New Jersey, are cooking to-go meals of hearty soups, breads and rolls for low-income neighbors through collaboration with a local nonprofit. [Spokane Valley Tech's Advanced Manufacturing course](#) in Spokane Valley, Washington, is just one of many CTE programs across the country that has created face shields using 3D printers. The class researched and tested five designs approved by the National Institutes of Health, eventually choosing one. The team fine-tuned the product, rounding the edges of the plastic shields for greater comfort, and donated more than 50 shields to local health care providers, as reported by *The Spokesman-Review*.



HIGHLIGHT: CTE STUDENTS PROMOTE MASK WEARING

Among the many challenges faced in fall 2020 by instructors at [Nassau Technical Career Center](#) – a shared-time center that offers CTE programming for learners in grades 9-12 on the campus of Florida State College of Jacksonville in Yulee, Florida – one of the most difficult was getting students to wear face masks properly. Teachers shared that instructional time was being used to enforce mask-wearing policies.

To help address this dilemma, the entrepreneurship and marketing teacher at the technical center partnered with two digital media teachers in the Nassau County School District to promote proper mask wearing.

Entrepreneurship and marketing students researched successful business slogans and developed key phrases to promote proper face mask usage. Digital media learners studied graphic design principles and used Adobe software to design posters and flyers promoting proper mask wearing. Upon receiving the finished artwork from the digital media classes, the entrepreneurship and marketing students assisted with the printing and distribution of campaign materials.

Now, more students are aware of the importance of proper mask wearing throughout all campuses involved. In addition, the learners who actively participated in the campaign have a sense of ownership and pride and are now advocates for proper masking.

Providing hands-on learning and lab hours

The success that high-quality CTE programs of study have in engaging learners is closely connected with the opportunities they provide to participate in authentic, project-based learning that tackles real-world challenges, facilitated by equipment, tools and facilities that support learning — both remotely and in person.

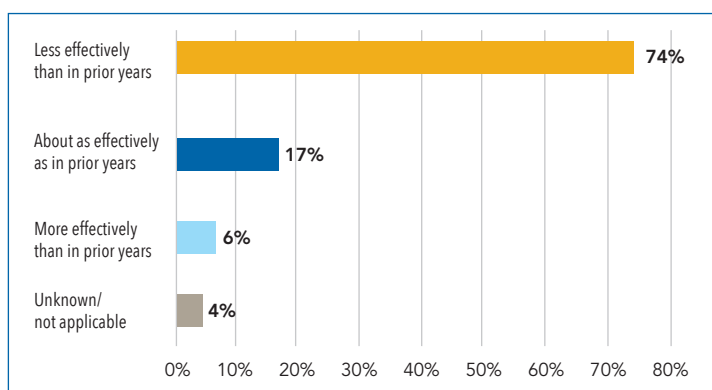


Chart 7: Effectiveness at providing hands-on learning/lab hours in the 2020-21 school year, compared to prior years. 649 CTE professionals responded to this question.

About three-quarters of CTE professionals report being less effective at providing hands-on learning and lab hours compared to prior years. Survey respondents teaching remotely are finding hands-on learning and lab hours more challenging than those teaching in person. However, even educators in this latter group are encountering difficulties with hands-on learning and lab hours, likely owing to content and instructional modifications that address social distancing and other safety and sanitization guidelines.

Some CTE programs, especially those on the postsecondary level, have embraced a blended learning model with theory taught remotely and learners coming to campus for hands-on practice. As reported in the American Welding Society (AWS) [Welding Journal](#), the College of the Sequoias in Visalia, California, has been delivering welding education in a hybrid format. Students were divided into two cohorts that rotate between the lab and online learning using two learning management systems (LMSs) — Canvas and the AWS Online Educational Library. Learners complete a health survey before attending in-person classes, during which they wear masks. Instructor Randy Emery cites numerous benefits of blended delivery, including smaller teacher-to-student ratios; increased access for working adults; exposure to remote-learning technologies; and reduction in student travel time and costs.

For programs where in-person learning requirements must be met for licensing or certification, states and institutions are producing guidance to balance skill demonstrations with COVID-19 guidelines. For instance, the New York Division of Licensing Services has developed a [mandatory COVID-19 precaution checklist](#) for the in-person portion of the cosmetology exam, including health screening, social distancing, face coverings, disinfection requirements and replacing live models with mannequins. Similarly, the state's 16-hour [Supervised Practical Training](#) requirement for home health aide training must be completed in person, with procedures for how many students and instructors will be allowed in the skills lab at a given time so that social distancing can be maintained. Other states like [Oregon](#) have modified some licensing requirements to allow a portion of time to be met through simulations.

Where remote learning is more prevalent, one common innovation embraced in spring 2020 and continued this school year is the take-home kit: supplies and equipment packaged and picked up by students or delivered to their homes. Learners use these supplies to complete projects and send photos or videos of their completed work to their teachers. Examples include materials and tools for building Adirondack chairs; mannequin heads, color mixing bowls and hair clips; and ingredient kits for recipes.

For instance, CTE theatre instructor Felicia Latoya Brown

at [Trenton Central High School](#) in Trenton, New Jersey, gave students a Theatre-in-a-Box for virtual productions at home, including stage makeup, rope to learn rigging knots, Lego-type bricks to make sample set designs, small sewing kits to learn the basics of hand sewing, and tablecloths to serve as green screens.

While many instructors are developing their own take-home kits, some organizations have come to the rescue. [Harbor Freight Tools for Schools](#) has distributed more than 3,500 tool kits, including a tool bag, assorted hand tools, measurement tools and/or safety gear, to skilled trades teachers to lend to their students.

Other CTE programs have turned to simulations. Fully computerized simulations, such as simulated patient interactions, electricity simulations and business simulations, are good alternatives for certain programs of study. Other simulation packages include both computer modules and physical equipment, such as eyewear and a stylus, and can be checked out to learners. The automotive technology program at [Renton Technical College](#) in Renton, Washington, incorporated zSpace augmented reality (AR)/virtual reality (VR) tools this past year. The laptops are pre-loaded with curriculum, and the accompanying handheld tools allow learners to “pick up” virtual objects from the screen and manipulate the objects by turning them, zooming in or out, or taking them apart. Instructor Warren Takata has observed that learners are very engaged when using zSpace.

Finally, some CTE programs — especially those in essential sectors — have made up for reduced time on campus with industry-specific equipment by ramping up the amount of time their students spend engaging in work-based learning at a work site.



HIGHLIGHT: CTE LEARNING IN THE OPEN AIR

In fall 2020, the CTE department at [Rockbridge County High School](#) (RCHS), in Lexington, Virginia, collaborated to provide students, as much as possible, with a genuine CTE experience. RCHS faculty supplemented virtual instruction with an outdoor CTE classroom along with prepackaged materials for hands-on practice.

While RCHS delivered most instruction remotely, students in certain CTE programs could sign up to work one-on-one with their instructor: automotive technology and auto body, building trades and construction technology, manufacturing, and electronics. In addition, aerospace technology students flew drones. Family and consumer sciences learners carved pumpkins. The outdoor, socially distanced setup enabled students to complete performance assessments and check off competencies. Those learners who chose not to participate in the open-air classroom participated in virtual learning and assessment.

To comply with safety regulations, learners completed health screenings and had their temperatures taken at check-in. All students and instructors wore masks at all times. Workstations were sanitized after each use, and some learners also wore gloves.

Throughout the fall, educators worked to ensure that all learners who chose to participate in the outdoor classroom had transportation. RCHS hoped to take the classroom mobile, traveling to locations throughout the community with equipment loaded on trailers. However, rising case rates and colder weather resulted in the closure of the outdoor classroom in mid-November.



A carpentry student participates in RCHS's outdoor CTE classroom. Photo courtesy of RCHS.

Providing work-based learning experiences

High-quality CTE programs of study provide sustained, meaningful interactions with industry or community professionals that foster in-depth, firsthand engagement with the tasks required in a given career field. These experiences can occur at the work site, in the community, on campus through school-based businesses or — even before the pandemic — virtually.

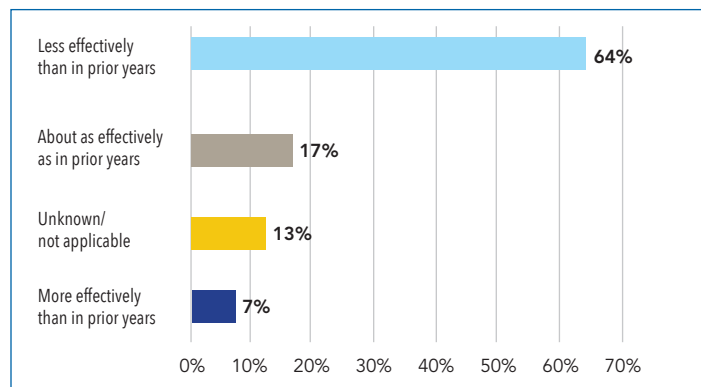


Chart 8: Effectiveness at providing work-based learning experiences in the 2020-21 school year, compared to prior years. 649 CTE professionals responded to this question.

About two-thirds of CTE professionals report that they are less effective at providing work-based learning (WBL) experiences than in prior years. Educators teaching all or mostly remotely are finding work-based learning more challenging than those teaching all or mostly in person. However, more than half of individuals teaching in person are still having difficulties this year, likely reflecting economic downturns and enhanced workplace liability restrictions for COVID-19.

These challenges echo data from other sources, including [Glassdoor](#) online postings and data from [EdWeek Research Center](#). Polling from the [National Association of Colleges and Employers](#) (NACE) shows that while only 2.4% of employers were canceling all summer 2020 internship opportunities, larger percentages were canceling internships in the recreation and hospitality, transportation, engineering services and manufacturing sectors. Among NACE respondents who planned to maintain their summer internship program, more than half were [going virtual](#), while others were shortening or delaying internships. Respondents to an ongoing ACTE-myOptions® survey also report a significant increase in virtual interaction with employers this year.

A number of states have supported flexibility in WBL delivery this school year. For example, state guidance from [Iowa](#), [Nebraska](#), [New York](#), [Oregon](#) and [South Carolina](#) offers latitude to local CTE programs to provide remote,

blended or safe work site learning. [Minnesota](#) guidance for the 2020-21 school year leaves it up to districts to determine whether learners can go to a work site or whether to recognize remote engagement, industry credentials or other career exploration activities for work experience course credit. For the state's youth apprenticeship program, districts can work with partners to reevaluate student training plans and to help students complete their 450 hours in alternative settings or over an extended period of time. The [North Carolina Community College System](#) is temporarily allowing course substitutions or waivers for WBL course requirements.

Many CTE programs have embraced virtual industry engagement. This engagement commonly includes virtual work-site tours, interviews with industry professionals and mentoring sessions. However, more intensive experiences like job shadows, microinternships and internships have occurred, especially in career areas that require less specialized equipment. Examples of virtual WBL include the District of Columbia's [DC Career Conversations](#) platform and [Career Ready Internship Program](#), which was remote in 2020, as well as Oklahoma CareerTech's recently launched [Virtual Job Shadow](#) platform. Kansas has launched a [micro-internships](#) program in which students remotely complete short-term, paid professional assignments in sales, marketing, finance, human resources, technology and other areas. Employers develop a project that will take up to 40 hours of work and select interns with the appropriate skill set from the [Parker Dewey](#) platform.

Students can even [co-develop](#) their own virtual industry experiences. For instance, as part of an annual [Manufacturing Day](#) organized among Portland Community College; Oregon Manufacturing Innovation Center, Research & Development; and the Northwest STEM Hub, metals and manufacturing students at St. Helens High School in St. Helens, Oregon, recorded virtual interviews with tradesmen and -women about what it's like to work in the trades, the skills and training required, and how to prepare for a career in advanced manufacturing. The interviews and other Manufacturing Day content reached 12 school districts and approximately 270 students in Northwest Oregon.

School-based enterprises have also pivoted to offer online services or provide contactless delivery or pickup. For instance, [McFarland DECA](#) in McFarland, Wisconsin, created an online school retail store with shipping, delivery and pickup options. The store launched in October 2020 with more than \$1,000 in sales in its first week. Student managers go to campus once a week to fill orders.

Other WBL opportunities continue in person, especially in essential industries and occupations. For instance, adult students in the Practical Nursing program at

[Assabet Valley Regional Technical School](#) in Marlborough, Massachusetts, are practicing their skills, interacting with patients and getting clinical experience hours by administering COVID-19 vaccines. In addition, [Apprenticeship Carolina](#), a division of the South Carolina Technical College System, develops registered apprenticeship programs in the state. The group reports that during the pandemic, some employers are giving apprentices even more opportunities for on-the-job experience while other employees are quarantining.

Apprenticeship Carolina and the [Richland County School District One](#) recently certified the state's first pre-apprenticeship program. CTE students who are nearing program completion can apply for these paid experiences with a variety of employers, including City of Columbia departments such as public works, parks and recreation, and wastewater management. Students have just started to go on-site, following safety protocols and outfitted with Richland One CTE masks.

HIGHLIGHT: YOUTHFORCE NOLA INTERNSHIPS PIVOT TO VIRTUAL

YouthForce Internship (YFI) is a paid work experience and training program for high school students that includes 60 hours of work-readiness training and a 90-hour internship. It is one service of [YouthForce NOLA](#), an education, business and civic collaborative that prepares New Orleans public school students for high-wage, high-demand career pathways.

Due to COVID-19, YFI pivoted to [remote participation](#). Interns were paired with either a technical training provider or an employer partner, matched based on their interest in one of YouthForce NOLA's skill clusters: health sciences, digital media/IT, skilled crafts and business services.

Students who paired with training providers gained technical and employability skills, earned credentials such as NCCER Project Management and got exposure to a variety of career options, including those they may not have previously considered. Students paired with employers formed small "consultancies" and worked together to solve a business problem identified by their employer.

To support the virtual model, internship coaches had a smaller case load than normal, and they held office hours to provide additional assistance. Supervisors received additional one-on-one support to develop or transition work plans for a fully virtual experience. YouthForce NOLA also adjusted its Employer Toolkit and Internship Playbooks to fit the virtual consultancy model and to support supervisors and worked with employers to develop custom playbooks.

Special events were also adjusted to ensure interns still had opportunities to engage with industry professionals. Instead of one Industry Exposure Panel with guests from each of the target industry clusters, the virtual format allowed for four separate industry panels, reducing the intern-to-panelist ratio and leading to more interns asking questions of the panel than usual.

Preparing learners for industry certifications and other performance assessments

An integral part of high-quality CTE is the demonstration of competencies and knowledge through both classroom assessments and assessments that lead to recognized post-secondary credentials, including industry-based credentials. CTE program area assessments are frequently performance based, requiring students to complete a task that can be virtual or may require an in-person demonstration of skills that can be difficult to translate to the remote space.

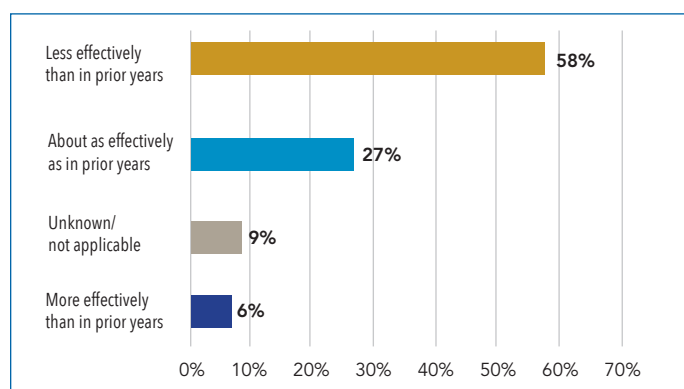


Chart 9: Effectiveness at preparing learners for industry certifications/other performance assessments in the 2020-21 school year, compared to prior years. 649 CTE professionals responded to this question.

Almost 60% of CTE professionals report being less effective at preparing learners for industry certifications and performance assessments than they were in prior years, with approximately one-quarter of respondents reporting they are about as effective as before. Responses vary by learner level: Postsecondary respondents, while still challenged, are struggling less than secondary educators. As noted earlier, postsecondary educators may be more experienced in remote teaching, and their institutions are also more likely to allow students on campus to complete lab hours and related assessments.

For classroom-based assessments, CTE instructors teaching remotely are assigning virtual quizzes and tests, written and recorded student reflections, and other remote-friendly ways of gauging skills. One common approach has been to emphasize the project-based nature of CTE assessments. For instance, teacher Lindsey Harlan of [Springdale High School](#) in Springdale, Arkansas, has been using digital interactive notebooks in her Lifespan Development and Food Safety and Nutrition classes that include course content and short project-based assessments that can be completed remotely. Harlan grades these projects against a rubric, allowing for an authentic demonstration of learning and reducing opportu-



nities to cheat. This project-based approach can be combined with the kits that CTE instructors are sending home for hands-on practice, or with the simulation tools described earlier, to assess student knowledge and skill gains.

Where students are allowed in the classroom or lab full- or part-time, classroom assessments can continue largely as before, though social distancing and safety modifications may increase the time it takes to test students and reduce the collaborative nature of some assessments.

Assessments for industry-based credentials have been challenging, though difficulties have been somewhat mitigated by remote proctoring and other flexibilities granted by providers like [NOCTI](#), [CompTIA](#), [NCCER](#) and the [National Healthcareer Association](#), among others. While remote proctoring is a welcome option for credentialing, especially during this time of widespread remote learning, there are concerns about digital inequities. Students may lack access to devices or broadband to take exams, and remote proctoring can be difficult and costly to scale.

Other accrediting bodies are also implementing strategies to support programs during the pandemic. For instance, the ASE Education Foundation is accepting [e-learning](#) for up to 25% of the required hours in automotive programs and is offering [accreditation](#) extensions. [ACF](#) is modifying its accreditation visits to minimize on-campus evaluation of culinary programs.

Generally, industry credentialing groups, such as CompTIA and the [Home Builders Institute](#) (HBI), reported a decline in exams taken in spring 2020. While data on industry certification during the pandemic is still evolving, it appears that this decrease has been greater for industry credentials awarded in collaboration with the education system, and especially on the secondary level, than for credentials awarded by employers or earned by individuals studying on their own. Data from [Workcred](#) points to increased demand for industry credentials by employers and individuals during COVID-19, and AED, which works with both employers and education programs (primarily postsecondary) in heavy equipment and diesel technology, saw a participation rate in 2020 that was approximately 90% of prior years.

Despite declines in assessments taken in some sectors, many credentialing organizations are experiencing sustained or increased interest in their products. For instance, CompTIA has seen greater use of its e-learning courseware, and HBI launched an LMS during the pandemic that has been well received.

HIGHLIGHT: CTSOS HELP STUDENTS THRIVE

CTSOS remain a critical tool this school year for keeping students engaged and developing their professional and leadership skills.

To continue serving students during the pandemic, many CTSOs have pivoted to offering virtual or hybrid events. The eight organizations that comprise the National Coordinating Council of CTSOs have embraced virtual or blended conferences and competitive events, including [Business Professionals of America](#), [DECA](#), [Future Business Leaders of America-Phi Beta Lambda](#), [Family, Career and Community Leaders of America](#), [FFA](#), [HOSA-Future Health Professionals](#), [SkillsUSA](#) and the [Technology Student Association](#). Other career-focused student organizations are doing the same, including [Educators Rising](#) and [FIRST Robotics](#).

For instance, for this year's 2021 Virtual International Leadership Conference, HOSA is creating its own simulated skill environments using a combination of platforms and technologies. Some live skill events will contain simulated steps in which the competitor will have to physically interact with the platform to demonstrate knowledge; for instance, by moving a mouse to withdraw the correct amount of medication.

On the state level, COVID-19 restrictions have also spurred the development of virtual conferences and competitive events. Iowa HOSA quickly flipped its spring conference to a [live virtual event](#) when campuses closed in March 2020. Each competitive event was hosted as a Zoom meeting, using the waiting room function to allow in one competitor at a time. This past fall, Kentucky, Ohio and Michigan FCCLA joined together to host the [virtual FCCLA Tri-state Officer Development event](#).

Additionally, [Kansas DECA](#) is offering virtual challenges for students to complete on their own or as a part of the classroom experience. Postsecondary partners, such as Kansas State University and Fort Hays State University, developed guidelines, provided judges, coordinated the judging process and are providing gifts for winning submissions. Some of the challenges include elevator pitches; a business-case competition, based on a business impacted by COVID-19; an entrepreneurship business plan; job search and interview activities; and a business information systems project using a dataset in Excel.

Other CTSO chapters are continuing with in-person activities. In February 2021, Klein Independent School District in Klein, Texas, hosted its 52nd annual [FFA Livestock & Project Show](#), with more than 800 projects shown by 500 FFA members – including livestock and horticultural projects, scientific investigations and agriculture mechanics, as reported by the *Houston Chronicle*. COVID-19 safety measures included feeding schedules to minimize the number of students in the same space, wristbands for each exhibitor and two immediate family members, and a livestream. The livestream gave attendees a closer view of the students exhibiting their projects than is normally allowed, and the district plans to continue livestreaming the event, even after the pandemic.

Data from NOCTI shows that the number of students engaged in industry credentialing in the 2019-20 school year was significantly lower than prior years. However, those who did continue with the credentialing process appeared to be more focused, as indicated by their higher attainment rates, according to NOCTI President/CEO John Foster. For instance, in Pennsylvania, 81% of students who attempted an industry credential through NOCTI earned a certification in 2018-19; this rate grew to 87% in 2019-20.

Some campuses have met with relative success at offering industry credential assessments in 2020-21. Susquehanna County Career and Technology Center (SCCTC) in Springville, Pennsylvania, which has been open to students four days per week, accomplished in-person NOCTI pre-testing this fall and plans to administer in-person exams in April. The center is following masking and social-distancing recommendations, as well as NOCTI recommendations for using mannequins for exams in programs like health care technology that previously used live participants. SCCTC is also stretching out testing over more days.

Other CTE programs that are not offering the performance portion of NOCTI assessments this year are still offering the written modules. During the current school year, almost 1,500 customers used remote proctoring for the written portion of NOCTI pretests in January 2021, Foster reports. For the performance portion of assessments, he describes a number of innovative solutions used throughout the pandemic, including instructors observing student performance through a window or using video cameras.

In addition to classroom and industry assessments, in 2020, many states waived requirements for end-of-course assessments in CTE subject areas and/or accepted course grades in lieu of assessments, as in [Ohio](#). In the current school year, states like [North Carolina](#), [Kentucky](#) and [Arizona](#) are requiring end-of-course or end-of-program CTE assessments, with extra flexibility. For instance, North Carolina is allowing public school units to take extra time for testing and to offer testing at alternative locations; Arizona is also lengthening the testing period as well as allowing teachers to serve as proctors.



HIGHLIGHT: CTE LMS FACILITATES LEARNING, ASSESSMENTS

In March 2020, HBI quickly moved to launch its [CTEtechWorks](#) learning management system. This blended learning solution for residential construction had been in development, but HBI rapidly deployed it when COVID-19 hit.

CTEtechWorks offers multiple types of instruction, including videos and simulations, and allows for self-paced learning. The content includes employability skills and safety topics as well as trade-specific content in plumbing, HVAC, electrical and solar. HBI has partnered with VR provider [Interplay Learning](#) to add digital training simulations and VR. Students learning from home can take part in computer-based simulations, such as troubleshooting and repairing a leaking toilet. When in the lab, students can use VR tools to further immerse themselves in these simulations. Closed captioning and Spanish translation are available.

The LMS also includes written assessments that can be completed online; performance assessment still needs to be completed in person. HBI Vice President of Education Bethany Shean shares that many construction education programs are using a hybrid delivery model and will hopefully be able to fulfill these in-person requirements in spring 2021.

In addition, HBI is offering an employer-based option for earning credentials. If a student who left their program without earning an HBI credential because of COVID-19 restrictions is hired by an employer, that employer can complete an HBI skills evaluation for the student and report the results to the instructor, leading to the credential award.

HBI has had a lot of interest in CTEtechWorks: More than 15,000 student and instructor users have completed 112,000 blended learning courses, including single courses, full learning paths and certification assessments.



Screenshot of a CTEtechWorks simulation on diagnosing circuits. Image courtesy of HBI.

Accessing the internet and online technology tools

The pandemic caused the quick pivot of education, including CTE, to the virtual space through remote and blended delivery models. While completely remote learning is not sustainable for many — if not most — CTE subject areas, high-quality CTE programs of study are doing their best in the short term to deliver some or all of their content virtually.

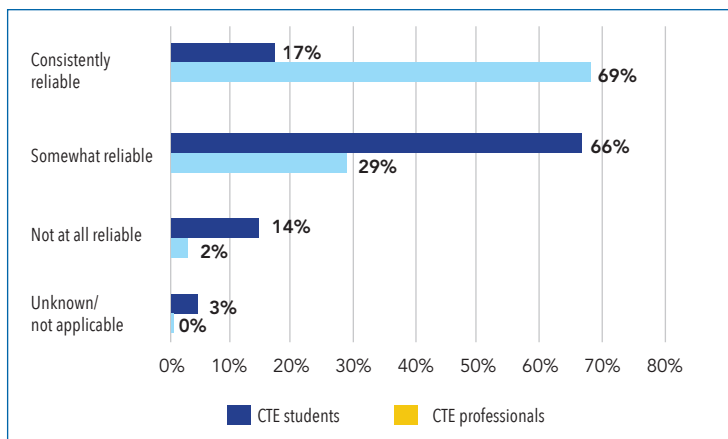


Chart 10: Reliability of respondents' own access to the internet and online technology tools compared to their perception of the reliability of student access. 649 CTE professionals responded to this question.

When it comes to their own access to the internet and online technology, the majority of CTE professionals report that their access is consistently reliable. However, most CTE educators rate their students' access as only somewhat reliable, with 14% categorizing it as not at all reliable. Rural respondents are, unsurprisingly, more likely to report internet/technology access as a challenge, and rural CTE educators are more likely to report that their students' access is not at all reliable.

This aligns with data from the [Federal Communications Commission](#), which reports that more than 21 million Americans lack broadband access, and [BroadbandNow Research](#), which estimates this number at 42 million — disproportionately impacting rural areas.

Rural learners are not the only students who struggle with technology and broadband access. The percentage of households that always have a computer and internet access available for educational purposes decreases with household income, according to an analysis of U.S. Census Bureau data by the [Georgetown Center for Education and the Workforce](#). Lower-income students also have less frequent "live" contact with teachers, whether in person, via phone or by video.

Technology costs are also being accrued by learners and their families during the pandemic. While about 65% of house-

holds [report](#) that schools and districts have provided them with computers, only 4% report they've been provided with internet access. In addition, more than half of postsecondary learners [report](#) making purchases to facilitate virtual learning.

For CTE, technology gaps can be even more challenging owing to more specialized hardware and software needs in many program areas, as well as challenges with access to remote assessment and credentialing, as noted earlier.

These connectivity challenges are broader infrastructure issues than CTE leaders alone can solve. Expanding broadband has been included in [federal COVID-19 relief legislation](#), and a number of [states](#) have made recent investments in this infrastructure.

However, CTE programs and institutions are doing their part. CTE educators report that their districts and institutions have distributed computers and Wi-Fi hot spots or have staged hot spots using school buses or parking lots. For instance, in spring 2020, Butler Tech in Ohio installed hot spots in its campus parking lots. This year, Laramie County Community College's library is checking out computers and hot spots to any student who needs them, using the same system they use for checking out books.

Supporting special and underserved populations

High-quality CTE programs of study promote themselves, recruit students, and use operational and instructional strategies that support both access and equity for each and every student, regardless of their sex, gender identity, sexual orientation, race, ethnicity, nationality, ability or age; as well as for all of the special population groups outlined in federal statute.

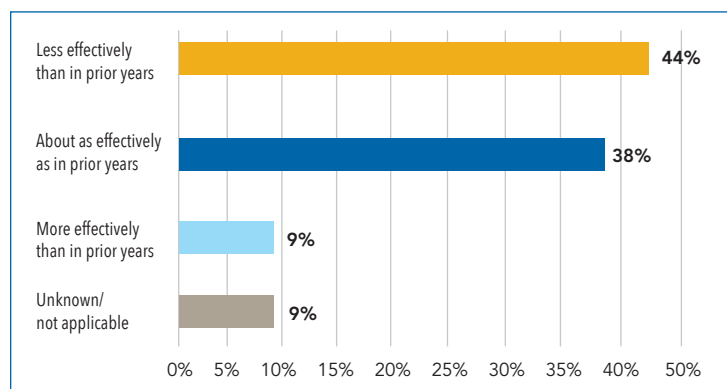


Chart 11: Effectiveness at supporting special/underserved populations in the 2020-21 school year, compared to prior years. 649 CTE professionals responded to this question.

A little less than half of CTE professionals report that they are less effective at supporting special and underserved populations in CTE programs this year than in prior years, while 38% report being as effective as before and 9% report being more effective.

While research on the pandemic's effect on different learner groups is in its early stages, some studies point to reduced efficacy, particularly for English learners and students with disabilities, across education programs generally. For instance, a recent [Government Accountability Office](#) study found that lack of access to technology and specialized equipment, language barriers and shorter school hours were among the challenges complicating distance learning for English learners and students with disabilities. The [American Institutes for Research](#) found that most districts, regardless of their poverty level or setting, reported more challenges during COVID-19 in complying with federal special education laws and providing accommodations and services for students with disabilities.

In addition to trying to meet the needs of students with disabilities and English learners during the pandemic, educators across learner levels and subject areas are deeply concerned with access and equity to high-quality education for people of color, economically disadvantaged individuals, rural learners and women — groups who have been disproportionately impacted by the virus, virus-related unemployment and education disruptions, and digital inequities. These pandemic impacts build on inequities experienced by learners of color, women, students with disabilities and other learner groups in education more generally, and in high-quality [CTE programs](#), specifically.

ACCESSIBILITY AND UNIVERSAL DESIGN FOR LEARNING

One bright spot for learners from special populations during the pandemic is the greater focus on accessibility of course materials through captioning, alternative text and similar features. For instance, 77% of postsecondary accessibility offices reported [greater collaboration](#) with other college departments in spring 2020 than ever before.

Relatedly, education leaders are also paying more attention to Universal Design for Learning (UDL), a framework for designing learning environments that are accessible and challenging for all. UDL incorporates not only accessibility of course materials but also accessibility for different learners and learning styles through techniques like providing choice and developing autonomy. This school year, New Hampshire has paid for a UDL credential for every teacher in the state, including CTE teachers, and

worked with [CAST](#) to develop CTE-specific modules on UDL for CTE educators.

CTE instructors have embraced these trends, creating accessible online materials and harnessing student choice to better engage with students who have different learning styles and needs. For instance, as noted earlier, instructor Lindsey Harlan has created digital interactive notebooks for her classes by converting paper-based materials into a digital notebook with photos, videos, slides, worksheets, notes and more. She shares that these notebooks can be easily modified with extra materials or differentiated assignments for students with an individualized education plan (IEP). Harlan is also helping more instructors effectively use digital notebooks with a dedicated [Facebook group](#) that has more than 5,000 members worldwide.

LEARNERS WITH DISABILITIES

CTE professionals are among the many instructors, paraprofessionals and counselors who have risen to the challenge of connecting with learners with higher needs through teletherapy; frequent phone calls, texts or video chats; and porch visits. One COVID-19 innovation that might be here to stay is the [virtual IEP meeting](#), which allows parents and educators greater flexibility and has led to increased participation from key players, including CTE instructors.

Transition supports and activities have also moved online. For instance, [TransitionTN](#) has hosted a number of virtual transition fairs for Tennessee students with disabilities, their families and the professionals that support them. These fairs address transition-related topics, such as postsecondary supports, employment resources and independent living services.

In addition, CTE programs designed for learners with disabilities are pivoting to serve those learners through remote and blended delivery. In Colorado, the [School to Work Alliance Program](#) (SWAP) — a collaborative initiative between the Colorado Division of Vocational Rehabilitation and local school districts/Board of Cooperative Educational Services — has transitioned its Osage Café culinary arts program to the online environment. Now, learners receive hand-delivered cooking supplies and practice in their own kitchens while taking part in remote lessons. Each student has a SWAP support person who also attends the remote lessons to provide assistance and support. Another SWAP program is connecting learners with disabilities with seniors in long-term care facilities to converse over video, also aided by a SWAP support person.

UNDERREPRESENTED AND NONTRADITIONAL LEARNERS

Programs that target career exploration and industry engagement for learners who are traditionally underrepresented have similarly pivoted to the remote space. This opens up opportunities for mentorship and engagement by connecting underrepresented students with industry professionals from across the nation, or around the world, that reflect their identities. For instance, [FabFems](#) is an international database that virtually connects female learners with women who are STEM professionals to serve as role models and mentors.

Another example is the #GirlsInSTEM #GirlsInTech initiative at [Clark County School District](#) in Nevada. Among its many career development activities, the initiative had been showing STEM films in real theaters to learners, sponsored by movie theaters and media companies, and accompanied by question-and-answer sessions with women in STEM professions and hands-on activities like making an origami lunar module. In March 2020, the district was set to pilot movie showings for the whole family, with one theater showing a film in English and another in Spanish, when the event was canceled due to COVID-19. Since then, the initiative has pivoted to virtual events that families can watch at home or teachers can stream in the classroom. For International Women's Day in 2021, they offered the movie *Pioneers in Skirts*, a film that follows ambitious women, including three teen girls on a robotics team. It was followed by a question-and-answer session with director Ashley Maria.

HIGHLIGHT: E-PORTFOLIOS SUPPORT LEARNERS WITH IEPs

In the 2020-21 school year, culinary arts instructor Rachel Conover of Indian Valley Vocational Center in Sandwich, Illinois, has been providing her students – about half of whom have IEPs – with choices for demonstrating learning, including videos, photos and written reflections.

To streamline this process, she uses [CTEfolio](#), a digital portfolio developed to align with UDL principles. Students can curate evidence that demonstrates their learning in one central location. Conover can offer feedback directly on student work, and students can make improvements based on her input. Learners have access to CTEfolio for five years after graduation, and employers can be given access to the portfolio to see evidence of student competencies.

Tools like CTEfolio are particularly useful for learners with IEPs, Conover says, who can struggle to effectively navigate multiple digital platforms. She describes how digital portfolios also help students who struggle with verbal communication, memory, anxiety and organizational skills to assemble and display learning and skill sets to instructors and potential employers. In addition, accessibility features like text-to-speech, speech-to-text, dictionary and translation are built in to the system.

The screenshot shows the CTEfolio app interface. At the top, there's a header with 'SOMERFOLIO' and a user profile icon. Below that, a challenge titled 'ARCHITECTURAL DESIGN & PRE-ENGINEERING' is displayed, with a sub-challenge 'Isometric technical drawing'. The interface is divided into three steps: STEP 1 involves watching a video tutorial on creating an isometric drawing in AutoCAD; STEP 2 is 'Upload a photo or video' with a text box for 'Enter your response...'; STEP 3 is 'Select up to three competencies that you demonstrate', with a list of competencies including 'Applying Technology', 'Measurement', 'Design Methods', 'Applying Engineering Practices', and 'Working with Models'. At the bottom, there's a 'SUBMIT' button and a 'POST' button.

Brockton and Somerville school districts in Massachusetts are also using CTEfolio. This image shows one of the challenges that Somerville students can take part in through a customized app. Image courtesy of CAST.

CAREER, SOCIAL AND EMOTIONAL DEVELOPMENT

High-quality CTE programs of study strive to help learners meet their personal and professional goals by incorporating career and academic planning, counseling and advising activities as well as social and emotional learning (SEL) across CTE curriculum and experiences.

CTE educators and career development professionals, including school counselors and college advisers, frequently share responsibility for these activities and are facing similar challenges during the pandemic in engaging learners, according to the [American School Counselor Association](#). In addition, school counselors are coping with changing responsibilities this school year, including following up with students who have not attended virtual classes or performing added on-site duties like lunch, hall or bus monitoring as students are spread out for social distancing or schools face staffing issues.

Career counseling and advising

Despite the challenges of this school year, school counselors, career development professionals and CTE educators are continuing to help students gain career knowledge and engage in academic and career planning. With declines in FAFSA completion and postsecondary enrollment already evident, and monumental job losses in some sectors, career and academic planning is more important than ever in encouraging learners to maintain their momentum toward completion or transfer and to help them find jobs.

Continuity of counseling and advisement is particularly important for special populations and underserved groups who have been hit hardest by economic downturns and have canceled or changed their postsecondary plans owing to COVID-19 more than other learner groups.

Fortunately, many online tools already provide a wealth of opportunities to continue with career planning virtually. In fact, when campuses closed quickly in March 2020, many CTE programs immediately pivoted their course content to focus on career planning and employability skills using online platforms like [Kuder](#), [MajorClarity](#), [Naviance](#), [Xello](#) and others that their schools or institutions were already using. In addition, postsecondary advising and career centers transitioned to virtual advising and job fairs, sometimes in collaboration with platforms like [Handshake](#), a job search platform for college students.

CTE programs have embraced many virtual tools focused on career development in the wake of campus closures. One example is Accenture's [Skills to Succeed \(S2S\) Academy](#), a free online learning program that aims to build career planning and employability skills and confidence to help young people make career choices, find a job and keep it. S2S includes a variety of interactive simulations that let users make choices, see the consequences of those choices and try again, aided by a virtual coach. For instance, users can try out different answers to interview questions in mock interviews.

However, remote career advising and planning doesn't have to be high-tech. This is especially important when working with students who struggle to access devices or broadband. School counselors, advisers and instructors have used email, text and phone calls to check in with students on their career, academic and SEL needs. Simpler virtual tools are another option: The San Diego County Office of Education created a [Career Exploration BINGO](#) Google document with activities, such as building a resume, developing goals before graduation, considering future lifestyles and exploring careers in priority sectors as well as careers that don't require a four-year degree. Each activity includes guiding questions and links to further information.

Social and emotional learning

Many people may not associate CTE with SEL, but CTE programs are increasingly incorporating these skills in order to support student success in life and in the workplace. The [Collaborative for Academic, Social, and Emotional Learning](#) defines SEL as a process to "acquire and apply the knowledge, skills, and attitudes to develop healthy identities, manage emotions and achieve personal and collective goals, feel and show empathy for others, establish and maintain supportive relationships, and make responsible and caring decisions." [Research](#) has demonstrated SEL benefits for academic achievement, attitudes and classroom behavior.

The challenges of the pandemic, civil rights protests and political upheaval throughout the past year have only increased this focus on SEL and mental-health awareness across education, generally, and within CTE, specifically. While ACTE's survey did not include a question on this topic, many survey participants wrote in their own responses, sharing their concerns about their students' SEL and mental health, their own mental health, and the stress and

fatigue of this school year. This aligns with information from the [University of North Carolina at Chapel Hill](#), [New America/Third Way](#), [National PTA/National Education Association](#) and [Challenge Success/NBC News](#) that raise concerns about student mental health and stress levels, especially for students of color, young women and LGBTQ+ students, as well as data on teacher burnout cited earlier.

Moreover, almost half of [school counselors](#) report increased responsibilities for SEL implementation this school year, especially counselors in an all-virtual environment. This focus is apparent when it comes to professional development priorities: School counselors are particularly interested in professional learning on mental health, grief and trauma, and social and emotional topics, along with virtual counseling and counseling technology; diversity, equity and inclusion; and anti-racism practices.

SEL also helps develop employability skills that are taught in CTE programs and are integral to workforce success. It is embedded in some CTE curriculum and standards, such as the [National Standards for Family and Consumer Sciences Education](#). In addition, [North Carolina](#) has connected the five core SEL competencies of self-awareness, self-management, social awareness, relationship skills and responsible decision-making with the state's employability skills standards; integrated these competencies into CTE courses; and provided related [professional development](#). Similarly, the Idaho Division of Career Technical Education is integrating SEL into CTE across the state using [IMAGO](#) digital content focused on life skills, self-awareness, social awareness, and rational and ethical decision-making.

In addition to these more formal integrations, many CTE instructors are prioritizing student's mental health and SEL during COVID-19 through regular group and individual check-ins using phone, text, video chat and other tools. For instance, culinary arts teacher Cheryl Ann Niedzwiecki of Burlington School District, Vermont, uses the [Mood Meter](#), developed by Dr. Marc Brackett of the Yale Center for Emotional Intelligence, to elicit how students are feeling. The Mood Meter is a visual tool that helps students pinpoint their emotional state and become comfortable sharing their less positive feelings.

In some instances, CTE students in education and training programs are learning how to develop SEL in the younger generation. High school students at the [Teacher Academy](#) of Renton School District 403 in Renton, Washington, have been working remotely one-on-one with elementary students who need extra emotional or academic support. Instructor Carla Smith describes how the elementary students feel special having a "big kid" talk with them about how they are feeling, provide help and advice, and offer

translation support for language learners. In addition, there are plans for the high school students to help the elementary students develop and practice mindfulness by leading breathing exercises and yoga.



HIGHLIGHT: COLLEGE LAUNCHES VIRTUAL ADVISING CENTER

At St. Petersburg College (SPC) in St. Petersburg, Florida, advisers and staff had to determine quickly how to provide advising services remotely before the start of the fall 2020 semester. The college decided to create a Virtual Advising Center with advisers available on demand over Zoom. During their virtual advising sessions, students could get personalized help with registration, course planning and scheduling, transfer information, financial aid and more.

Work schedules were created so that at any given time, a minimum of 20 advisers would be online and available to help students. Preparation included training for advisers on how to use Zoom as well as training for staff members who would manage the online environment and connect students with an adviser. In addition, the college's marketing department communicated the new initiative to the thousands of students who would be participating.

The Virtual Advising Center launched two weeks before the beginning of the fall term. More than 75 college staff members, including career and academic advisers, administrative support staff, advising managers and associate provosts, were involved in the daily operation. During the first three weeks of the initiative, more than 3,100 students were served. Through the success of the Virtual Advising Center, the college was able to meet its budgeted enrollment goal for the fall semester by the first day of the term.

After the peak registration period ended, SPC decided to make it a regular component of student services. [SPC](#) students can now choose between appointments with advisers over Zoom or phone, the drop-in Virtual Advising Center over Zoom, and walk-in advising on campus (following COVID-19 protocols).

PROFESSIONAL DEVELOPMENT

High-quality CTE programs of study provide, support and promote professional development for program of study staff, including secondary CTE teachers, postsecondary CTE faculty, administrators, school counselors, career development professionals and other personnel — whether in person or remotely.

Professional development experiences in 2020-21

Most CTE instructors, school counselors and career development professionals report that professional development experiences this school year have been somewhat effective, with 22% rating professional development this year as not at all effective and 17% as very effective.

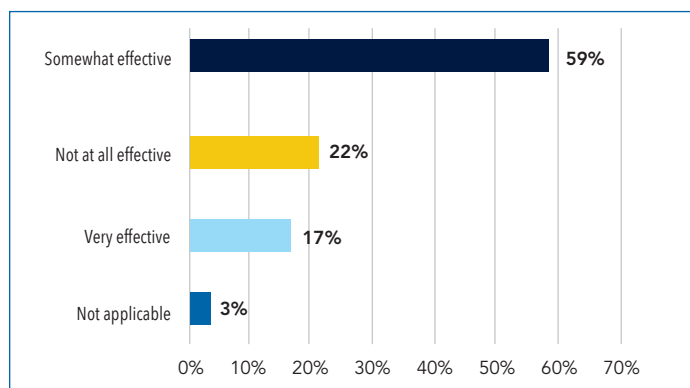


Chart 12: Effectiveness of professional development experiences in the 2020-21 school year. 458 CTE instructors, school counselors and career development professionals responded to this question.

This response likely reflects the challenges that teachers, faculty, counselors and other staff have faced pivoting to largely unfamiliar modes of teaching. It may also indicate that educators, just like students, can struggle to engage with and gain skills and confidence from remote professional learning experiences.

In response to campus closures in spring 2020, many states, districts, institutions, and education and industry groups like the [CTE Coalition](#) created listings of relevant resources to help instructors teach CTE remotely. Professional learning communities sprang up or gained members, such as California's [CTEOnline.org CTE Sector Community Groups](#) and the [National Association of Agricultural Educators Communities of Practice](#). And education organizations like [ACTE](#), [NCLA](#), [ISTE/EdSurge](#)

and the [National Alliance for Partnerships in Equity](#), as well as employers and industry groups, created resources and hosted virtual professional development and networking events.

As the year progressed, states, districts and colleges began to develop COVID-19 guidance documents. Several states incorporated specific guidelines for CTE, including [Louisiana](#), [Michigan](#), [Nebraska](#) and [Tennessee](#). In addition, institutions, districts and states went virtual with their conferences for CTE educators, as in [Tennessee](#) and [Oklahoma](#).

Professional learning experiences in the past year have often focused on pandemic needs, such as how to use and maximize LMSs. For instance, the CTE programs in [Yuma Union High School District 70](#) have embraced the Canvas LMS during COVID-19. Their approach to integrating Canvas includes a system of supports: professional learning communities, technology assistance, instructional templates, a rubric for gauging success, and a professional development model with differentiated tracks for novice, intermediate and advanced users.

Other examples of targeted professional development for pandemic-era CTE include Georgia and Idaho, which purchased statewide licenses for ACTE's [CTE Learn](#) professional development platform. In addition, the California Department of Education's Career and College Transition Division partnered with ACTE, CTEOnline.org and the San Diego County Office of Education's Office of College and Career Readiness to create [CTE distance learning newsletters](#) highlighting lesson plans, webinars and resources for specific CTE program areas. And, as noted earlier, New Hampshire has invested this year in UDL for its CTE teacher workforce.

Professional development priorities

For the 2020-21 school year, CTE professionals identified the ACTE high-quality element of Engaging Instruction as their top priority for professional development, by far, followed by Facilities, Equipment, Technology and Materials. This clearly aligns with the greatest challenges for this year: motivating and engaging learners and providing hands-on learning and lab hours.

Write-in responses primarily addressed remote and blended learning, including curriculum, technology and internet access; how to transition hands-on activities to the remote space; and how to make the most of limited in-person lab time. CTE educators also repeatedly expressed their concerns about their students' and their own mental health and the need for time and grace to navigate this difficult year.

These CTE professional development priorities echo the top three needs of K-12 educators in spring 2020, as identified by research from the [RAND Corporation](#): remote engagement and motivation, hands-on learning and SEL. They also overlap significantly with the [school counselor professional development priorities](#) described earlier: social, emotional- and mental-health concerns; virtual counseling and counseling technology; and diversity, equity, inclusion and anti-racism practices.

While future professional development needs will depend on how CTE programs look in a post-pandemic world, it is likely that the priorities identified above will continue for some time to come, as CTE programs address the evolving skill needs of youth and adults and continue to integrate diverse delivery methods and technological tools.

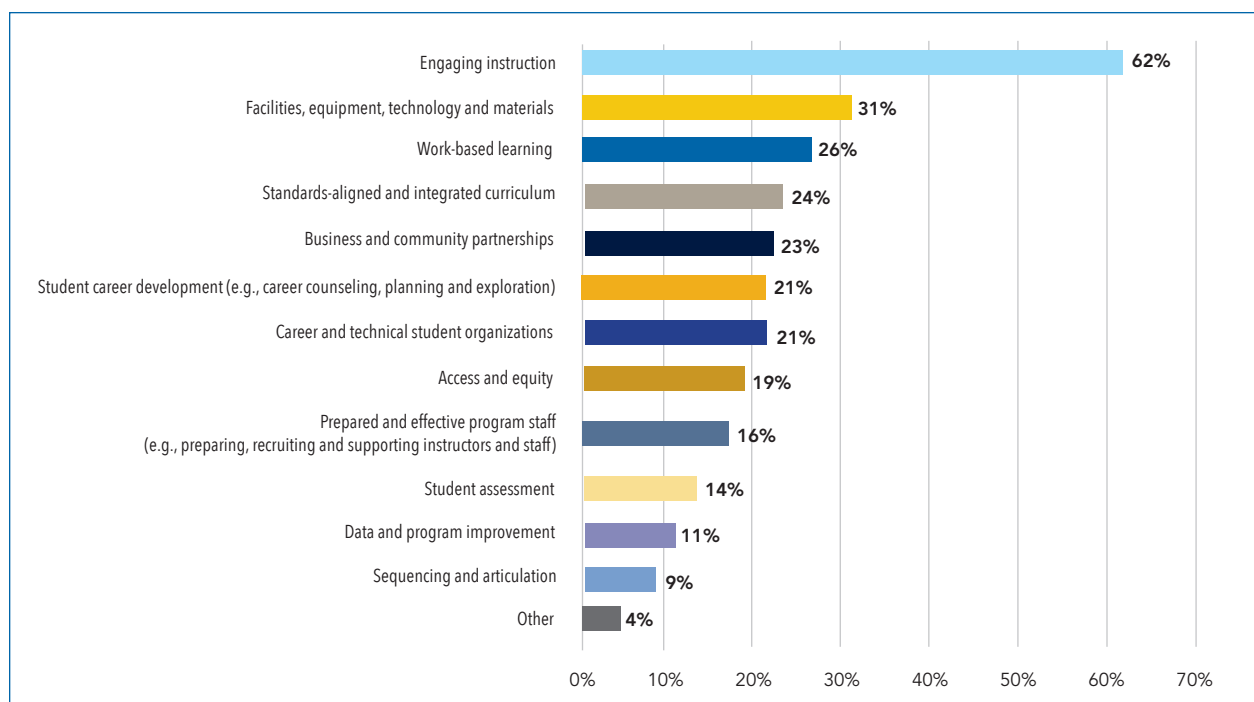


Chart 13: Top priorities for professional development in the 2020-21 school year. 636 CTE professionals responded to this question. Respondents could pick up to three options.

PROGRESSING PAST THE PANDEMIC

Economic outlook

The ability of CTE programs of study to serve current and future students will depend on how nimbly they can shift, where necessary, to fit post-pandemic workforce needs.

As of December 2020, there were [10 million fewer jobs](#) than before COVID-19, down from 22 million fewer jobs at the height of pandemic restrictions in spring 2020. The [hospitality and tourism sector](#) was hit particularly hard. As of writing, the K-shaped recovery is impacting workers in different ways, with [employment rates](#) rebounding for high-wage workers, slightly depressed for middle-wage workers and significantly down for low-wage workers. Going forward, the [Congressional Budget Office](#) is projecting a quick bounce-back of GDP, with a slower recovery for the workforce. The workforce is expected to return to its pre-pandemic size by 2024, with unemployment gradually declining through 2026.

Industry-specific projections are in their early stages, and we can expect more and better information about the post-pandemic workforce as we progress through 2021, including new projections from the [U.S. Bureau of Labor Statistics](#) in September. Of most concern to many CTE leaders is the future outlook for the hospitality and tourism workforce. The [American Hotel & Lodging Association](#) (AHLA) reports that more than 670,000 hotel jobs and almost 4 million jobs in the broader hospitality industry were lost due to the pandemic, and anticipates that the hotel workforce will not reach pre-pandemic levels until at least 2023. AHLA predicts that business and group travel will be the last types of travel to recover, while [McKinsey Global Institute](#) predicts that about 20% of business travel is gone for good.

This tracks with other predictions that remote work is here to stay, particularly in large metropolitan areas like Washington, DC, and [San Francisco](#), which will impact many sectors of the economy, from transportation to hospitality. For instance, the [Greater Washington Partnership](#) expects a continuance of remote work in the DC metro area, leading to reduced foot traffic and revenues for small dining, entertainment and retail businesses that have historically served downtown workers.

However, the hospitality and tourism sector is nothing if not nimble, leaning heavily into takeout and delivery and creating new dining spaces using heated pods or unoccupied hotel rooms during the pandemic. In addition, the American Rescue Plan Act of 2021 created a \$28.6 billion

[Restaurant Revitalization Fund](#) that will provide tax-free grants to restaurant owners with 20 or fewer locations. The legislation also includes assistance for [transportation sectors](#), including funds to support the workforce for transit, Amtrak and airlines.

Other CTE-related industries are expected to bounce back more quickly. Among manufacturers, findings from the [National Association of Manufacturers](#) (NAM) and [SME Media](#) point to optimism. NAM respondents, after ranking weaker domestic demand as the primary business challenge for two quarters, are back to rating talent shortages as their top concern, and 39% of SME respondents indicate they will be cross-training workers to take on new job roles, especially in the aerospace and defense industries. The aerospace manufacturing sector also received a boost from the [American Rescue Plan](#) in the form of a temporary payroll support program.

The construction industry is also feeling relatively optimistic. Employment in construction is down, but not as much as employment in many other sectors, according to [Associated Builders and Contractors](#). And while few contractors responding to an [Associated General Contractors \(AGC\) of America/Sage](#) survey plan to expand their workforce in 2021, many contractors also report difficulty filling open positions with qualified staff. AGC predicts that workforce shortages will be severe when construction demand rebounds.

The IT sector is also looking strong. According to [CompTIA](#), employment in technical occupations and across the technology sector generally has been rebounding in 2021. Almost 40% of IT companies expect to add to their headcounts in 2021, and even more companies will be [investing in their existing workforce](#): 75% plan on pursuing training options and 54% plan on certifying their workforce. In addition, the [U.S. Bureau of Labor Statistics](#) projects increased demand for IT occupations post-pandemic.

As employment rebounds, many employers in these and other CTE fields will be looking for workers with relevant industry credentials and the necessary skills, including remote communication and collaboration skills for [increased telework](#).

CTE outlook

Among all the uncertainty of this school year and the economic outlook, one thing has emerged: Many people report they expect to need skills training or updating in the coming years, and CTE programs and institutions are their preference for gaining these skills.

More than half of Americans under 40 believe that they will need to acquire new skills to advance their careers, most within the next three years, according to a recent [Charles Koch Foundation and SkillUp Coalition](#) poll. Of those who anticipate the need to upskill, 72% expressed a preference for an option other than a four-year college or university, including CTE programs, two-year college programs and options that lead to certificates, badges or microcredentials. A survey from [Strada Center for Consumer Insights](#) similarly found strong preferences for skills training and non-degree credentials among individuals planning to pursue education and training.

Current and prospective community college students also report a need for CTE and skills training. According to a recent [New America](#) poll about community college enrollment, majorities of “stop-outs” (people who enrolled in spring 2020 but did not enroll in the fall) and “aspirants” (people who considered but did not enroll in the fall) expect to enroll in community colleges in the future, and a majority of stop-outs need to finish their program of study in order to earn a credential such as a license.

Several states and institutions have already launched or invested in CTE programs for COVID-19 recovery, including Delaware’s [Rapid Workforce Training and Redeployment Initiative](#), Michigan’s [Futures for Frontliners](#) program, Iowa’s [Registered Apprenticeship grant opportunities](#) and local programs like the [Rapid Credentialing](#) initiative at Manatee Technical College in Bradenton, Florida. In addition, multiple governors have proposed investments in CTE in their [2021 State of the State addresses](#). These efforts will be helped by the \$170 billion investment in education coming from the [American Rescue Plan Act of 2021](#), especially if CTE leaders can be at the table when decisions are made about how to allocate these funds.

In addition to this need for skills education and retraining, there are early indications that some learners like the hybrid model, though this varies by CTE program area and learner level. For instance, more people in New America’s poll of community college students prefer a mix of remote and in-person instruction over remote-only or in-person-only learning. Anecdotally, CTE educators have told ACTE about the benefits of a blended model, including increased access, particularly for working adult students;

lower student-to-teacher ratios when in person; and an increase in students directing their own learning.

And while [early evidence](#) on the quickly implemented remote learning spurred by the pandemic points to negative consequences for many students and a reduction in services provided to learners with disabilities and English learners, anecdotally some [students with disabilities](#) have benefited from accessible online instruction while [other learners](#) have benefited from increased self-pacing, more sleep and lower social anxiety.

Many, if not most, CTE programs cannot be 100% remote while also imparting the technical, academic, and employability skills and experiences students need. However, the careful and thoughtful incorporation of more diverse learning models and technologies — including blended learning, mobile learning and AR/VR simulations — may help increase access and options for learners while continuing the CTE commitment to real-world engagement.

The appropriate mix of these delivery models and technologies will look different in each CTE program area and on each learner level. In some CTE programs, the vast majority of learning will need to take place in a classroom or lab with in-person instruction on industry-standard equipment to ensure students get hands-on practice, learn safety procedures and gain relevant credentials. In other programs, instruction, practice and work-based experiences could take place primarily in the virtual space. Mobile labs and high-tech simulations can supplement both in-person and remote instruction to increase access points and opportunities for practice. Going forward, CTE leaders may look to merge these delivery methods and technologies in a considered, thoughtful way that maximizes their benefits while meeting learner needs.

RECOMMENDATIONS FOR CTE IN A POST-COVID-19 WORLD

As COVID-19 enters a new phase, it is leaving a changed landscape that has presented major challenges but also opportunities for innovation in CTE. CTE professionals can harness the disruption that COVID-19 caused, and the lessons learned from the past year, to reimagine how CTE serves learners. Emerging from the pandemic with stronger CTE programs will require the input of multiple stakeholders and systems working together — coordination across education, workforce development and employer communities will be critical moving forward. Steps CTE leaders can begin to take now include the following:

Reassess labor market alignment

CTE will play an important role in recalibrating education for the post-COVID-19 workforce. Skill seekers are increasingly drawn to CTE programs, but this value is based on the labor market relevance of particular programs of study and resulting credentials. Where local and regional economies have shifted, CTE leaders must realign their programs of study to respond to these pandemic-related changes as well as to the long-term shifts toward remote work and automation that the virus accelerated.

Specific actions:

- Consult with employer and workforce partners on the most immediate, pressing labor market changes that resulted from the pandemic as well as potential mid- and long-term changes in occupations and skill needs.
- Lay the groundwork for the next comprehensive local needs assessment update required under Perkins V, which in most states will be in due in 2022. Focus your assessment on changes resulting from COVID-19 in the local and regional workforce and on pandemic-related challenges in access, equity and program delivery. Evaluate what worked and what didn't work in spring 2020 and in the 2020-21 school year across your programs.
- Begin making changes to your CTE program of study offerings to reflect new information, taking care to exercise caution while the post-pandemic economy is still evolving, particularly with programs for younger students who have a longer educational outlook.
- Continue to build relationships across stakeholders to create a more coordinated system of career preparation and talent pipeline development in your region.

Skill and reskill the workforce

CTE will be on the front lines of preparing youth and adults for the workforce that emerges in the wake of COVID-19. To best support the post-pandemic workforce, CTE leaders must continue to provide more flexible, student-centered pathways for learners to develop the knowledge and skills necessary for high-wage, high-skill, and in-demand and emerging occupations — particularly for adult workers who have been displaced during the pandemic. This skilling and reskilling should focus on not only technical and academic skills but also employability skills needed in modern, technology-enabled workplaces.

Specific actions:

- Ramp up implementation of modular, stackable and competency-based delivery models that let learners customize their education to fit their individual pace, skill and credential needs, and time frames. This approach can be particularly helpful for displaced workers who seek to skill up and gain employment quickly, while also providing on-ramps to continued education and training.
- Continue to scaffold competency-based learning within structured, mapped programs of study or pathways and a coordinated system of student advising to help learners navigate their futures and recover from the disruptions of the past year. As part of this scaffolding, postsecondary and adult programs should streamline enrollment to minimize fees and paperwork and make it easier for prospective learners to get started.
- Continue to incorporate opportunities to accelerate progress — through credit for prior learning, credit for workplace and military experience, early postsecondary credit and articulation — as well as opportunities for meaningful industry-recognized credentials into CTE programs. These opportunities can help students complete programs with valuable credentials, enter the workforce more quickly, earn more, and save time and money.
- Continue to grow “learn-and-earn” opportunities like youth and adult apprenticeships that help learners start careers, progress in their careers, and reskill for new post-pandemic opportunities while making a living wage.
- Integrate employability skills needed in the post-pandemic workforce throughout CTE programs, including the ability to communicate and collaborate remotely, which will likely continue to be a feature of many workplaces even after COVID-19.

- Develop outreach and messaging strategies that clearly and transparently communicate the benefits of CTE programs to prospective learners, especially adults who need reskilling.

To support the actions described above, postsecondary and adult CTE leaders may benefit from using the Education Strategy Group's [Rapid Response Toolkit](#). The toolkit provides practical advice and tools to help institutional and state decision-makers plan and execute strategies for quickly supporting displaced workers to obtain the skills needed in the post-pandemic economy.

Commit to equity

Another important task is confronting inequities in education more generally and in CTE specifically, particularly those that have been spotlighted or exacerbated by the pandemic. CTE leaders must recommit to early career exploration that exposes students to pathways and careers they may not have considered. In addition, CTE professionals must consider how to help current students recover from learning losses and assist current and future learners to get back on track with their education and career pathways, especially individuals from low-income, minority and special population groups who have been most negatively impacted by COVID-19.

Specific actions:

- Analyze your local CTE data from the 2020-21 school year for access gaps. Focus upcoming student recruitment and career exploration activities on students who are underrepresented in high-wage, high-skill and in-demand program areas.
- Expand elementary and middle school career exploration opportunities using a mix of in-person, remote, and blended tools and activities that support learning about self, learning about careers and engaging with employers. Focus efforts in locations and programs that have had to cancel activities over the past year to ensure those students do not miss out on critical opportunities for career development.
- Reconsider enrollment and admissions policies that disproportionately impact particular learner groups, including adults who may lack access to transcripts or similar documentation as well as learners who have missed classes, standardized tests, performance assessments and other opportunities in the past year.
- Analyze your local CTE data from the 2020-21 school year for learning losses and persistence and success gaps. Focus student supports, such as mentoring, coaching and bridge programs, on helping students who have experienced the most learning loss or disengaged from learning to reengage and complete their CTE programs or graduate.

- Work across institutions, learner levels and systems to coordinate and centralize wrap-around supports that help meet learners' pre-existing and pandemic-related educational, career, social and emotional, and tangible needs. Use multiple modes of communication and interaction to engage students, families and caregivers in education and career planning, building on what worked well during the past year.
- Continue to incorporate Universal Design for Learning, accessibility standards, social and emotional learning, and trauma-informed practices into curriculum and lesson development to address the needs of underserved and special populations.

Embrace innovative tools and delivery models

Many, if not most, CTE programs will continue to offer in-person learning to best enable students to develop and practice their skills in authentic environments. However, blended learning, mobile learning and tools like augmented reality/virtual reality simulations can be thoughtfully and carefully leveraged to engage students and provide them with multiple options for learning and achieving their goals.

Specific actions:

- Evaluate the technology-based tools and instructional strategies that were successful this year, and think through how they can be integrated into CTE programs even after in-person instruction resumes without pandemic limitations.
- Evaluate delivery models in light of knowledge gained during the pandemic to determine the content and experiences that can continue to be offered remotely and the content and experiences that must be offered in person.
- Collaborate across secondary and postsecondary levels and with employer partners to integrate technology-based tools, related instructional strategies and diverse delivery models in ways that are appropriate for each CTE program area and learner level.
- Continue to encourage self-directed learning, which many students gained skills and experience with this year. Consider models in which students complete knowledge-based modules at their own pace, and schedule time in a stationary or mobile lab for hands-on practice or use classroom time for more collaborative work.
- Continue to strategically invest in diverse delivery methods for hands-on learning, performance assessment and career exploration, such as video, virtual and augmented reality, and mobile labs.

- Continue to develop diverse strategies for industry engagement and work-based learning that provide more access points for students to experience the world of work and more options for employers to engage with learners.

Develop and support CTE professionals

Many CTE instructors, faculty, administrators, school counselors, career development professionals and other staff members have struggled this past year. Among education programs, CTE — with its hands-on focus — has been one of the most difficult to quickly pivot to remote and blended learning. CTE educators have borne the brunt of this challenge and will need time, support and professional development to recover and reflect on lessons learned this past year. In addition, educators coming into the profession will need training that addresses new delivery modes and technologies as well as inequities illuminated by the pandemic.

Specific actions:

- Support CTE educators by building more time for planning and professional development into the school day and year and by encouraging self-care.
- Provide pre-service and in-service CTE teacher education and professional development on equity in teaching through strategies like Universal Design for Learning, culturally responsive teaching, social and emotional learning, and trauma-informed practices, which are more important than ever after the challenges of the past year.
- Provide pre-service and in-service CTE teacher education and professional development on innovative delivery models and instructional strategies like technology- and game-based instruction, modularizing curriculum for hybrid delivery, flipped classrooms, and synchronous and asynchronous teaching.
- Provide time, support and resources for CTE administrators to develop plans to quickly respond to emergencies, such as pandemics and natural disasters, especially leaders of CTE-focused institutions like area career technical centers.

Advocate for CTE

Now is the time for CTE leaders and education and workforce development organizations to step up their advocacy for policies that support CTE quality, access and equity and emphasize CTE's important role in the country's recovery. Institutions, systems and states with strained budgets may not prioritize investment in CTE programs. This would be the wrong move: Data shows that learners

are very interested in CTE programs that deliver skills and relevant credentials for the post-pandemic workforce. But delivering on this potential will require investment and cross-system changes.

Specific actions:

- Share data with policymakers and education leaders about how CTE can develop the post-pandemic workforce in your local and regional economy.
- Share data with leaders about the impact COVID-19 has had on local CTE programs and what is needed to meet growing demands for skilled workers.
- Advocate for legislation or policies that support CTE learners to enter, persist and succeed in high-quality programs and to catch up from this pandemic year, such as expanded broadband access, graduation requirements and school schedules that facilitate CTE course taking, and flexibility in admissions and program requirements.
- Advocate for legislation or policies that facilitate easier integration of competency-based and diverse delivery models, such as easing clock-hour requirements that make it difficult for learners to receive credit for remote learning.
- Advocate for legislation or policies that ease learners' financial burdens, including making it easier for students in postsecondary CTE programs to access federal financial aid and other federal, state and local financial support.
- Ensure CTE leaders are at the table when decisions are made about how to allocate federal relief funds for school districts, postsecondary institutions, and state and local governments under the American Rescue Plan Act of 2021.
- Advocate for increased local, state and federal funding for CTE programs to meet the diverse needs articulated throughout this report.

ADDENDUM

Two surveys were fielded to the ACTE membership in early 2021. The first survey was sent to the full ACTE mailing list from January 11-23, 2021. It generated 649 responses. Respondent characteristics are described below.

Respondent work setting:

- Middle/high school: 64%
- Area career technical center/other shared-time center: 23%
- College/university: 7%
- Local/regional education agency: 3%
- State education agency: 2%
- Other: 2%

Respondent community setting:

- Rural: 28%
- Small town: 25%
- Suburbs: 23%
- City: 23%

Respondent job role:

- CTE instructor: 65%
- CTE administrator/principal/dean/department head: 21%
- Counselor/career development professional: 6%
- Other: 5%
- Local/regional/state education agency staff: 4%

Instructor/school counselor/career development professional years of experience:

- 21+ years: 23%
- 6-10 years: 18%
- 3-5 years: 17%
- 0-2 years: 15%
- 11-15 years: 15%
- 16-20 years: 13%

The second survey was sent to the ACTE Administration Division mailing list from February 15-22, 2021. It generated 297 responses. Respondents worked in the following settings:

- Middle/high school: 33%
- Area career technical center/other shared-time center: 32%
- K-12 education agency: 21%
- Other: 7%
- College/university: 4%
- Postsecondary education agency/system: 2%

Statistically significant differences were calculated at a 95% confidence interval ($p < 0.05$).

ACKNOWLEDGEMENTS

ACTE gratefully acknowledges all those who contributed to this publication, including the many ACTE members and other CTE stakeholders that responded to our surveys and have offered their insights as they navigate these challenging times. We would like to particularly thank those that gave of their time and expertise to review this report as well as those who shared challenges and innovative practices with ACTE:

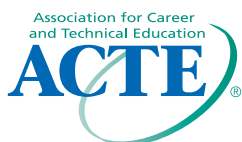
- Amanda Bastoni, CAST
- Snehal Bhakta, Clark County School District
- Patrick A. Biggerstaff, Area 31 Career Programs, MSD of Wayne Township; ACTE Administration Division Vice President
- Jason Blake, Associated Equipment Distributors
- Carole Boughton and Jill Koslosky, Laramie County Community College
- Felicia Latoya Brown, Trenton Central High School
- Reeca G. Carver, Kentucky Department of Education
- Coalition for Workforce Development Through CTE
- Rachel Conover, Indian Valley Vocational Center
- Marilyn Cunneen, Huntington Beach Union High School District
- Alice Davis, Susquehanna County Career and Technology Center
- Kathy Dickson, Apprenticeship Carolina
- John C. Foster, NOCTI and Nocti Business Solutions
- Glenn Hard, Careers in Construction Colorado
- Lindsey Harlan, Springdale High School
- Scott Jones, Kansas DECA
- Jamie Konecny, School To Work Alliance Program
- Heidi LaGrow, Calhoun Area Career Center
- Tana Lee, Richland County School District One
- Doug Major, Meridian Technology Center; ACTE President
- Imani Miller, YouthForce NOLA
- Terry Miller, Franklin County Career and Technology Center
- National Coordinating Council for Career and Technical Student Organizations
- Cheryl Ann Niedzwiecki, Burlington School District
- Paige Owens, Rockbridge County Public Schools
- Shelley Rust, Indiana ACTE
- Bethany Shean, Home Builders Institute
- Brian Simmons, Nassau Technical Career Center
- Carla Smith, Renton School District 403
- Allen Stubblefield, Troy High School
- Fred Tucker, St. Petersburg College
- Spencer Wallace, IMAGO
- Liz Wannemacher, CompTIA

ABOUT ACTE

The Association for Career and Technical Education (ACTE) is the nation's largest not-for-profit association committed to the advancement of education that prepares youth and adults for successful careers. ACTE represents the community of CTE professionals, including educators, administrators, researchers, school counselors, guidance and career development professionals and others at all levels of education. ACTE is committed to excellence in providing advocacy, public awareness and access to resources, professional development and leadership opportunities.

www.acteonline.org

Copyright © 2021, Association for Career and Technical Education



SPONSORED BY

