Building a Successful Online CTE Program

Online learning options provide resources for both remote and traditional learning settings—a beneficial feature when emergencies arise. Establishing practices for distance or online education can help districts prepare for a variety of situations, such as prolonged closures from weather, building issues, or student illness or medical event. Even so, online learning is more than just an emergency option and provides several benefits for Career and Technical Education (CTE) programs.

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The Importance of CTE

The focus of Career & Technical Education (CTE) is to enhance student success and offer real-world application of skills. Studies show incredible outcomes when implementing CTE programs in high school. Involvement in high-quality CTE programs increases the probability of a student graduating high school by seven to ten percent and results in a nearly two percent wage increase per advanced vocational course taken[1].

7-10%
Increased Probability of Student Graduating High School

These benefits are even more noticeable for students with low socioeconomic status, who are more significantly at risk of dropping out and not continuing with postsecondary education. Students report higher levels of self-confidence in their learning and greater efficacy when enrolled in CTE coursework. These positive feelings are especially crucial for retaining students who are not as successful in traditional education settings and can help motivate these students to continue educational experiences after high school. Some research even suggests the learning environment found in high-quality CTE programs can provide further educational benefits, such as better results on state tests[2].

2%
Wage Increase per Advanced Vocational Course Taken

Students and communities thrive when districts provide them with quality CTE programs. Developing a CTE program strong enough to ensure successful learning opportunities, no matter what events may occur, is essential.

[1] "The Effect of Career and Technical Education on Human Capital Accumulation: Casual Evidence from Massachusetts" by Shaun M. Dougherty; "Vocational and Career Tech Education in American High Schools: The Value of Depth Over Breadth" by Danial Kreisman and Kevin Stange

[2] "The Effect of Career and Technical Education on Human Capital Accumulation: Casual Evidence from Massachusetts" by Shaun M. Dougherty

[3] "Career and Technical Education Programs in Public School Districts: 2016-17" by Lucinda Gray and Laurie Lewis

Benefits of Online CTE

During the Coronavirus pandemic, many schools across the nation were forced to move to distance learning options. This event left teachers, particularly in CTE areas, scrambling for online alternatives to ensure students could continue to learn.

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Currently, 30 percent of districts across the nation offer online CTE courses, including blended or hybrid classes, with some learning happening in the classroom and some online[3]. These districts have found that online education is a way to mitigate common barriers districts face when trying to implement CTE programs.

BENEFIT 1 *Expand Options Without Expanding Cost*

When looking to expand CTE course offerings, districts often face logistical issues restricting the ability to offer a variety of course options. Funding constraints, limited classroom space or lack of necessary equipment can be barriers when districts consider widening the scope of their CTE program. However, online or hybrid courses can offer a viable alternative to traditional face-to-face classes.

For example, a district looking to establish a culinary arts program could utilize a hybrid course to help decrease costs. A current family and consumer sciences teacher could facilitate online learning. Students could use time in the classroom and at home to review food science concepts, watch cooking demonstrations and do training exercises. The district could partner with a local restaurant group to provide students with workplace learning experiences to practice their knowledge in real life. Workplace learning helps limit the need for building a demonstration kitchen for the teacher and the need to hire an industry-professional in the classroom. Funding could then be allocated for student transportation to work-based learning sites or to provide supplies for students to practice cooking methods at home.

Additionally, online CTE courses can provide students with the opportunity to explore more advanced courses. While a district may not find it economically feasible to provide full classroom instruction for a small number of students interested in pursuing advanced coursework in a CTE pathway, online instruction can allow these students to continue their CTE work. Being able to enroll in advanced courses will enable students to obtain the most benefits from their CTE program.

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[3] "Career and Technical Education Programs in Public School Districts: 2016-17" by Lucinda Gray and Laurie Lewis

BENEFIT (2) *Personalize Learning & Optimize Teachers' Time*

Online or hybrid courses can be student-paced, rather than teacher-paced. Student-paced learning allows students to tackle concepts at their speed and provides students with the ability to explore the topics most interesting to them. Research shows students who have the ability to control their study time perform better at recalling content than those whose study time is controlled[4]. By understanding and implementing the best strategies for teaching themselves, students also develop an invaluable workplace skill necessary for any future educational or career pursuit.

When online courses utilizing student-paced learned are well-organized and properly facilitated, teachers report students' progress through learning objectives quicker than in teacher-paced scenarios. With teacher facilitation, students are able to customize their classwork and find ways to dive deeper into topics they enjoy to promote in-depth engagement with CTE material and to encourage seeking out more advanced courses. Additionally, teachers can spend more time on individualized student feedback and on managing a thriving learning environment rather than focusing on presenting direct instruction.

BENEFIT (3) *Prepare Students for a Digital Workplace*

In an increasingly digital world, allowing students to practice skills for digital communication and collaboration will be beneficial for their future career or education pursuits. Online courses expose students to new software, enabling them to practice learning and navigating new technologies like those they may find in new workplaces. Additionally, students develop a skill set for utilizing digital tools for communication, collaboration and problem-solving they can bring to their future career choice.

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[4] "On the Effectiveness of Self-Paced Learned" by Jonathan G. Tullis and Aaron S. Benjamin
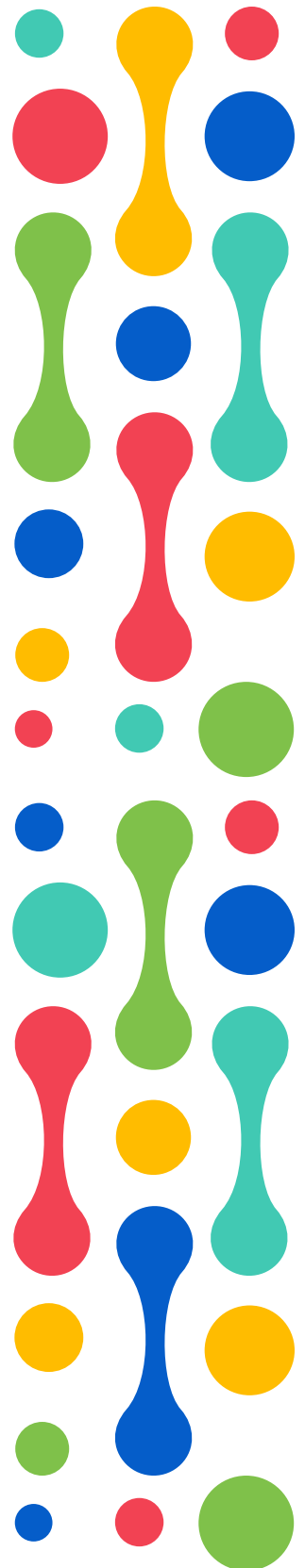
Building a Successful Online CTE Program

Online programs offer a wide range of possibilities for developing a custom course design to best fit for the school, curriculum and student population. These design factors include:

Modality

Courses can be:

- completely online with no classroom time

- blended or hybrid where classwork and homework have a range of classroom time and online time

- fully face-to-face classroom utilizing online curriculum and digital tools to complete course content

Instructor Role

Teachers can take a variety of roles in online courses, including:

- providing active direct instruction online

- organizing the course and being present online to answer questions and provide student feedback

Student Role

**Students can use online course tools to:**

- consume direct instruction (such as watching teacher-led lectures, videos or reading articles)

- complete problems or answer questions

- use simulations

- collaborate with peers

Communication Strategies

The way students and teachers communicate with each other can depend on online course design:

- synchronous communication: the teacher and all students are in an online space together to have live interaction, such as through a Zoom meeting or active chatroom

- asynchronous communication: all participants will access the online course at different times and may use comments or messaging services to communicate

- blended: a range of both types of communication, as needed
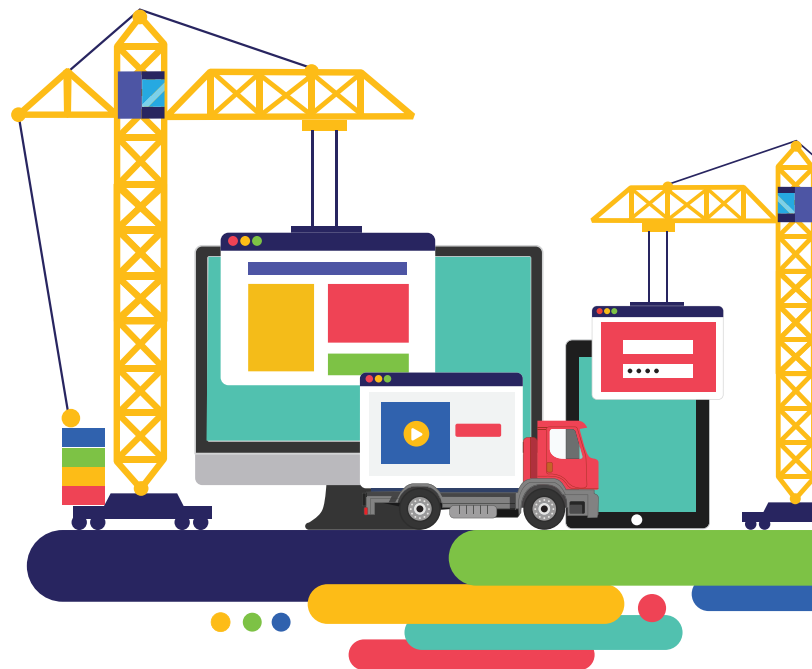
Beyond considering the design, of course, there are several factors unique to CTE courses that should be considered when creating online CTE programs.

Work with Industry for Real Workplace Skills

One of the best ways to ensure online programs are continuing to offer valuable coursework is by partnering with industries to provide activities based on real-world workplace skills. Blending classroom instruction with real workplace tasks will help enforce the importance of learning. Students should be given hands-on activities and projects, or teachers can pair instruction with time in an actual or simulated workplace.

CTE programs have success when they meet and anticipate industry demands. Students who learn outdated applications or technologies will be no more prepared for a career after emerging from a CTE program than those who do not enroll in CTE courses. Establishing an online CTE course should involve working closely with experts in the field to determine the skills students need to learn for adequate career preparation.

Train Instructors for the Unique Learning Environment

CTE teachers are often a unique population, with many educators coming from industry careers to work in classroom settings. On-going professional development and assistance curating classroom resources are vital to the success of any CTE program. However since online learning environments are unique, teachers should be provided with continued training on the best pedagogical practices and access to resources specifically designed for online instruction. Additionally, instructors will likely need to develop new strategies for classroom management and meeting the needs of their special population students in this new environment.

Administrators can begin the work by putting guidelines and expectations into place for any online courses or programs and can begin working with teachers to ensure continuing education and sufficient teaching and technological support is provided.
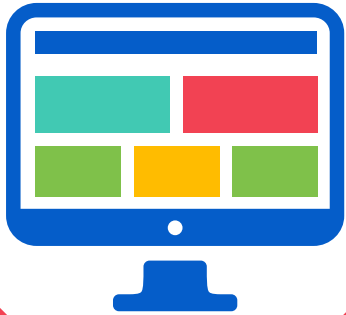
Ensure Accessibility to All Students

Students will have a range of technologies and internet capabilities at home. When developing an online CTE program, administrators should consider the full spectrum of their student population. Schools should provide options for every student interested in online courses and anticipate how to solve issues of access. Districts (particularly those who do not have one-to-one technology access) may struggle with this area, holding back from developing online courses because they do not know how to ensure access for everyone. However, just because students may not have all the same equipment at home does not mean a district should avoid online resources. Instead, consider:

- looking for online course options that work with a variety of devices to better fit students' access at home

- setting up internet and technology access in school buildings during and after school for students who do not have access to one or both at home

- offering the ability for students to rent technology to complete work, and have alternative methods for accessing content (for example, offer printable transcripts instead of requiring students to stream video or provide the option to mail-in assignments rather than submitting online)

Additionally, online courses will need to be inclusive. There are many technologies available to meet the students' Individual Education Program needs. Still, when designing an online program, the best strategy is to ensure these accommodations can be met easily with built-in features.

Successful Online CTE Instructional Content

High-quality online CTE curriculum should allow students to engage with topics in deep and meaningful ways, rather than just skimming the surface. Motivation can be difficult for students with online work, so students need to understand online learning activities are worthy of time and effort. Online curriculum should be rigorous and allow teachers to push students academically by presenting complicated concepts in exciting ways and by providing a framework for understanding the impact of activities and projects.

Online courses do not require a massive overhaul of course content, instead understanding how to adjust traditional in-class lesson plans and instructional materials for online learning can help teachers and students transfer to online settings easier.

Lesson Plans

Depending on the pacing structure selected for an online course, traditional lesson plans may need to be adjusted. For example, a student-paced course will require a lesson plan divided into modules rather than the more traditional daily or class period plans developed for teacher-paced courses. Dividing lessons into modules allows students to continue to meet learning objectives in an organized and thoughtful manner at their preferred pace. Each module in a lesson plan should contain the following elements for a well-structured online lesson:

Explaining Purpose

Learning objectives need to be clear for each lesson. Students can report feeling less motivated in online environments than they might in a traditional face-to-face setting. In conventional classroom settings, merely having an authority figure like a teacher and peers can help motivate students to complete work. Online teachers must provide ways to inspire students to be self-motivated. Students should have a clear understanding of what their learning objectives are and why the lesson is essential to them. The purpose should be communicated directly in the lesson's instructions. The purpose of the lesson should also be supported with activities like note-taking for students to identify the key concepts of a lesson and reflections or discussions, both of which ask students to make learning relevant to themselves.

Building a Foundation

Lesson plans should include a way for students to check what they already know. Activities like discussions or short writing assignments can help students review their knowledge base before learning something new. Additionally, providing students with essential vocabulary to study also helps them better approach topics. Online settings can extend the response time when a student has a question over lesson material, so students should have access to tools for solving problems they may run into on their own.

Presenting New Information

Most often, introducing new content is the most significant part of a lesson plan. Offering a variety of ways to present new information online (e.g., reading texts, watching videos, watching presentations, or lectures) can help students continue to stay engaged through an online course.

Checking for Understanding

Students should have the opportunity to ensure they understand the information presented in the lesson. Reviewing notes, participating in teacher-led discussions about content, asking questions, and even taking short assessments can all be valuable elements to ensure students understand new material.

Practice with New Knowledge

Students should be given opportunities to practice new knowledge both in groups where students can offer guidance to one another and individually where a teacher can assess how well an individual has grasped a concept. Students need to begin practice with low-stakes assignments through non-graded or graded-for-participation activities like worksheets, short writing assignments and other methods for practicing or planning the development of skills. Then students should move on to more significant or high-stakes development of skills like larger graded projects, presentations in front of class, and peer-reviewed assignments.

Often low-stakes assignments are easy to assign on online platforms; there are many online resources for developing worksheets or quick activities online. However, higher-stakes projects can be more challenging to facilitate online. Teachers should provide examples of what they are looking for when assigning high-stakes assignments. For example, if a teacher is asking students to create a tutorial video on how to use a kitchen tool, the teacher should link some tutorial videos for students to use as inspiration. Additionally, utilizing virtual meeting and collaborative software can help students collaborate on projects together and meet with teachers to get direct feedback on their assignment progress.

Reflect on Learning

Allowing students to reflect on their learning helps reinforce the purpose of each lesson. In online settings, teachers may ask students to reflect on a community comment board or host a video classroom discussion. Reflection is essential to engage students in online learning environments because it allows them to synthesize why the work they are doing is important. Not every lesson will be learning a skill used on the job, but every lesson should foster learning useful workplace skills. Students benefit from seeing how their coursework has real-world applications, no matter what the lesson covers.
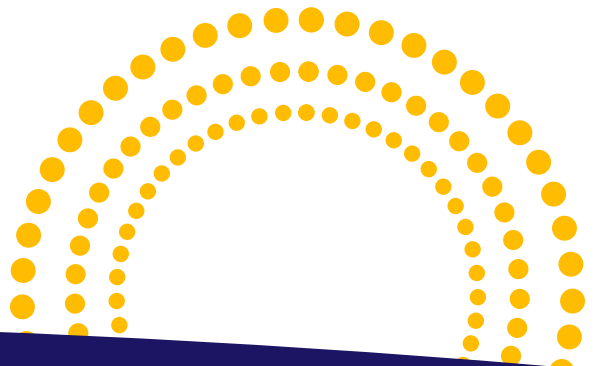
Hands-On Projects & Activities

Developing hands-on projects and activities can be seen as a daunting task for online courses. However, CTE courses need to have hands-on practice of skills to be valuable. There are several methods for developing hands-on projects and activities with online courses.

Utilize Hybrid Classes

Often, teachers find hybrid courses are ideal for hands-on projects and activities. Teachers can use a flipped-classroom approach, where direct instruction can take place online and class time can be used to work on hands-on projects and activities. This way, students have access to the necessary materials for the assignment, and teachers can oversee progress. This method works well for CTE subjects like construction and agricultural science, where safety may be a concern if students are left to complete tasks on their own.

Use What Students Have

When face-to-face class time is not possible, hands-on projects can still happen. The project design will need to be more flexible to allow students to use what they have at home. These types of assignments should focus either on practicing a skill or assign an end product to be completed, rather than providing step-by-step instructions.

EXAMPLE A

Instead of assigning students to cook a specific vegetable dish, a teacher could create a project asking students to cook a meal using two different vegetable cutting methods. Students can then utilize the food they have access to at home to practice the specific skills assigned.

EXAMPLE B

A teacher could assign students to build a model that demonstrates knowledge of basic stair construction using whatever materials the student has available at home (such as popsicle sticks, paper, cardboard).

Have Students Document Practice

Not every hands-on assignment will result in a tangible end-product. Teachers can assign students to practice skills and document their practice for teacher feedback. Documentation may include recording or photographing skills demonstrations, having students pair up to practice a skill over video chat with each student rating the other's performance, or having student-teacher video conferences to assess a skill demonstration.

EXAMPLE A

A teacher can assign students to video themselves practicing how to provide first aid for a first-degree burn using a stuffed animal or family member.

Partner with Workplaces

In some cases, students may benefit from completing projects on the job with an industry mentor, rather than completing simulated tasks at home. Students can learn the knowledge behind individual skills, ensuring they will have the ability to practice the skill hands-on in the workplace.

EXAMPLE A

A student working in the school store could watch a video on how to take inventory during class time then be assigned to complete inventory as part of their job later with a supervisor or mentor.

Establishing a Community

One of the most critical pieces of a successful online learning environment is the learning community. Teachers may need to spend more time fostering an active community online than they would have to in a traditional face-to-face classroom. Teachers need to develop ways to engage with students and to encourage students to engage with one another. Teachers should show they are present in an online classroom by providing announcements and initiating and maintaining conversations with students. Additionally, students benefit from both asynchronous and synchronous communications with the teacher and their classmates. Teachers should strive to provide ways for students to communicate over message boards, blogs, and comments, as well as using virtual meeting tools to allow students to meet each other and have conversations live.

Assigning collaborative work can also be important. Students benefit by learning from and teaching their peers. Students should be encouraged to use video or chat tools, use collaborative tools or meet up in real life to work on group projects. Not only is this important for education, but these practices allow students to prepare for the types of digital communication and collaboration they will need to utilize in workplace situations in the future.

About the Author

The team at CEV Multimedia is comprised of former educators and industry professionals whose goal is to provide CTE teachers with valuable and engaging online curriculum made in partnership with recognized specialists, educators and publishers from across the nation. CEV Multimedia has worked closely with CTE programs for more than 35 years to understand the challenges administrators and teachers face in providing students with the best quality learning, both in and out of the classroom. Their iCEV platform provides excellent online CTE curriculum for seven standards-aligned CTE subject areas and offers a testing platform for 16 industry certifications.

iCEV

Online CTE Curriculum, Instructional Materials
& Certification Testing