

# Career Technical Education and Outcomes in Texas High Schools:

A Monograph



**The Mission of the Texas Workforce Investment Council**

*Assisting the Governor and the Legislature with strategic planning for and evaluation of the Texas workforce system to promote the development of a well-educated, highly skilled workforce for Texas.*

# **Career Technical Education and Outcomes in Texas High Schools – A Monograph**

Texas Workforce Investment Council

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## **Career Technical Education and Outcomes in Texas High Schools – A Monograph**

Career and technical education (CTE) provides the technical knowledge and skills that are aligned with academic standards needed to prepare individuals for further education and careers in current or emerging professions. With a focus on secondary CTE, this monograph summarizes relevant legislation, discusses how CTE has evolved, and details the economic need and value of CTE. Finally, the association between CTE and student academic outcomes such as graduation from high school, transition to postsecondary education, and performance on assessments is illustrated.

Generally, the goal of CTE is to prepare students for successful careers. CTE classes range from career exploration courses to college classes and are offered in middle schools, high schools, community and technical colleges, and other postsecondary institutions. The Carl D. Perkins Career and Technical Education Improvement Act of 2006 (Perkins IV) defines CTE as organized educational activities that:

- A. Offer a sequence of courses that:
  - i. Provides individuals with coherent and rigorous content aligned with challenging academic standards and relevant technical knowledge and skills needed to prepare for further education and careers in current or emerging professions;
  - ii. Provides technical skill proficiency, an industry-recognized credential, a certificate, or an associate’s degree;
  - iii. May include prerequisite courses (other than a remedial course) that meet the requirements of this subparagraph; and
- B. Include competency-based applied learning that contributes to the academic knowledge, higher-order reasoning and problem-solving skills, work attitudes, general employability skills, technical skills, and occupation-specific skills, and knowledge of all aspects of an industry, including entrepreneurship, of an individual.

### **Relevant Legislation and Funding**

Since 1984, federal support for CTE has been provided by the Carl D. Perkins Vocational Act. The latest version of Perkins legislation, Perkins IV, was passed in 2006. Like previous Perkins legislation, Perkins IV stresses accountability. It requires that recipients at the local level submit an annual report detailing performance on core indicators. Perkins IV is also concerned about improving CTE programs, stating that funds may be used to support or develop new CTE courses and initiatives, including career clusters, career academies, and distance education.

Perkins IV is the first act that uses the term “career and technical education” and offers the new definition (cited above) that modifies the previous concept of vocational education. Perkins IV strikes the stipulation that CTE focuses on the preparation for sub-baccalaureate careers. Instead, Perkins IV states that CTE will offer a sequence of courses that provides coherent and rigorous content and technical skill proficiency, an industry-recognized credential, a certificate, or an associate’s degree.

The importance of integrating academic and vocational instruction is highlighted. The legislation frequently mentions “rigorous and challenging academic and career and technical instruction” for “high-skill, high-wage, or high-demand occupations.” CTE and the focus on rigor is also reflected in the requirement for establishing programs of study that incorporate secondary and postsecondary education elements that lead to an industry-recognized credential, certificate at the postsecondary level, or an associate’s or bachelor’s degree.

In addition, House Bill 5 (HB5) was passed in 2012. This legislation instituted a new standard course of study for high school students and also reduced the number of exams high school students were required to pass in order to graduate. HB5 replaced the minimum, recommended, and advanced high school program with a 24-credit foundation high school program. Of note, students can earn endorsements on their diplomas in five areas: STEM (science, technology, engineering, and math), business and industry, public services, arts and humanities, and multidisciplinary studies. The courses prepare students for technical training or college readiness.

For program year 2017 – 2018, Texas received \$93,665,938 in Perkins basic grant funds. Of those grant funds, 30 percent is used for postsecondary programs and 70 percent is used for secondary purposes. Of that 70 percent, at least 85 percent is allocated to school districts through the basic formula grant. The Texas Education Agency (TEA) is responsible for administering the Perkins grant for the state and at the secondary level. The Texas Higher Education Coordinating Board (THECB) is the subrecipient that administers the Perkins grant at the postsecondary level.

Information provided by the TEA Grants Administration Division indicates that TEA issued 421 notices of grant awards to serve 959 school districts or local education agencies (LEAs) in 2017 –2018. Eighteen awards were issued to education service centers to serve as fiscal agents for LEAs that do not meet the threshold to receive the grant as single entities. TEA’s 2016–2017 *Academic Excellence Indicator System State Profile Report* states that 1,523,779 secondary students in Texas (46.3 percent) were enrolled in CTE. In addition to secondary CTE, these programs are offered through 50 community college districts, three state colleges, and four technical colleges.

### **The Evolution of CTE**

Numerous changes in society, technology, the workplace, and educational philosophy have influenced occupational education. Career and technical education in 2018 is very different from earlier models of career training. Vocational education was conceptualized as a separate system of education that emphasized job-specific skills over the academic curriculum and was often used as an alternative or inferior path. CTE still suffers from this outdated stigma associated with vocational education.

CTE (as defined by Perkins IV) stresses rigorous content, alignment with challenging academic standards, a focus on technical skill proficiency and credentials, and preparation for further education. Additionally, CTE programs stress the education of students for a range of careers in an industry instead of for specific trades. Effective CTE programs also actively partner with local employers to design high-quality programs grounded in industry standards and recognize the skills that are needed to succeed in both college and career.

Modern CTE programs are multifunctional, providing hands-on learning models and employability skills, such as teamwork, problem solving, and self-management. These management skills are portable across occupations. Modern CTE programs also help foster career exploration across in-demand career fields.<sup>1</sup>

### **The Economic Impact and Value of CTE**

Nationally, and in the wake of the recent recession, employers have expressed concerns about the availability of enough skilled workers. Although this concern varies by state and industry, some employers reported difficulties in filling vacant positions even during the recession when numerous individuals were unemployed. Furthermore, the pending retirement of a large number of skilled workers from the Baby Boom cohort is expected to cause difficulties in the near future. Effective CTE programs can prepare individuals for these skilled professions using a curriculum aligned with industry standards and pathways to postsecondary education to replenish the workforce and support a thriving economy.

According to the Bureau of Labor Statistics, five of the 10 fastest growing occupations in Texas between 2014 and 2024, referred to as middle-skill occupations, will require on-the-job training, postsecondary training, or an associate's degree, but not necessarily a bachelor's degree. By definition, CTE programs are designed to provide the training for these occupations in high-growth industries. In addition, four of these fast growing middle-skill occupations are also high-wage STEM occupations.

Furthermore, CTE provides an educational context that enables students to apply what they are learning in core academic courses such as math, science, and English to real world problems. This helps students realize the relevance of these courses and motivates the acquisition of additional academic skills. In short, CTE classes have the rare capability to provide an engaging, relevant education while answering the question, "Why do I need to learn this?"

### **CTE Participation and the Academic Benefits of CTE**

Various studies have demonstrated the association between CTE program participation and improved student academic outcomes. Participation in CTE programs is associated with higher graduation rates, lower dropout rates, and higher scores on the Texas Assessment of Knowledge and Skills (TAKS) assessments. Specific studies and data are provided below.

#### Graduation and Dropout Rates

Students who complete CTE courses during their junior and senior years are more likely to graduate on time and less likely to drop out than students who do not take CTE courses.<sup>2</sup> In 2013, the national four-year graduation rate was 81 percent.<sup>3</sup> In the 2013-2014 school year, according to the Office of Career,

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<sup>1</sup> Anthony P. Carnevale, "Career ready out of high school? Why the nation needs to let go of that myth," <https://theconversation.com>, (2018).

<sup>2</sup> American Educational Research Association, <http://www.aera.net/Newsroom/Taking-Career-and-Technical-Education-Courses-Later-in-High-School-Reduces-Chances-of-Dropping-Out-and-Improves-On-Time-Graduation>, (2018).

<sup>3</sup> Stillwell, Robert, *Public School Graduates and Dropouts from the Common Core of Data: School Year 2011–2012: First Look*, <https://nces.ed.gov/pubs2014/2014391.pdf>, (2014).

Technical and Adult Education, there were 7,502,727 secondary CTE participants, or students who took at least 1 credit of CTE. During the same time period, the average high school graduation rate for students concentrating in CTE programs was 93 percent<sup>4</sup> Table 1 illustrates the graduation rates for all Texas high school students and students participating in a CTE program. From 2012 to 2016, graduation rates were higher for students taking two or more CTE classes compared to all Texas high school students. In 2016, the graduation rate for students with two or more CTE classes was 95.6 percent compared to 89.1 percent for all Texas high school students.

**Table 1: Graduation Rates for Texas High School Students, 2012 to 2016**

	2012	2013	2014	2015	2016
All Students	87.7%	88.0%	88.3%	89.0%	89.1%
Students Participating in a CTE program	95.0%	94.9%	95.2%	95.6%	95.6%

Source: Texas Education Agency, Secondary Completion and Dropouts in Texas Public Schools

Additionally, dropout rates are lower for students with two or more CTE classes. Table 2 indicates that the dropout rates for all Texas high school students are higher than for students who are participants in a career and technical coherent sequence of courses or are participants in a tech prep program. In 2010–2011 the dropout rate for students with two or more CTE classes was half that of all Texas students.

**Table 2: Dropout Rates for Texas High School Students, 2012 to 2016**

	2012	2013	2014	2015	2016
All Students	2.4%	2.2%	2.2%	2.1%	2.0%
Students Participating in a CTE program	1.3%	1.2%	1.1%	1.0%	1.0%

Source: Texas Education Agency, Secondary Completion and Dropouts in Texas Public Schools

### Transition to Postsecondary

National data demonstrates that postsecondary enrollment rates were lower for high school graduates who were CTE concentrators than for nonconcentrators. Overall, 82 percent of high school CTE concentrators enrolled in postsecondary education, compared to 91 percent of graduates who were not concentrators. Within the occupational areas for which enrollment rates could be calculated, postsecondary enrollment rates for CTE concentrators ranged from 66 percent for graduates in repair and transportation to 93 percent for graduates in computer and information sciences.<sup>5</sup> Table 3 illustrates the percentages of Texas students participating in a CTE program that transition to postsecondary education.

<sup>4</sup> Association for Career & Technical Education, <https://www.acteonline.org/aboutcte/#.WoL4LYjwZPY>, (2018).

<sup>5</sup> U.S. Department of Education, *Participation in High School Career and Technical Education and postsecondary Enrollment*, <https://nces.ed.gov/pubs2018/2018043.pdf>, (2017).



**Table 3: Percentage of Texas High School Students with Two or More CTE Classes Transitioning to Postsecondary**

	2011–2012	2012–2013	2013–2014
Students Participating in a CTE program	48.35%	47.63%	47.82%

Source: Texas Education Agency TPIER - Texas Education Reports  
<http://www.texaseducationinfo.org/>

TAKS Assessment Performance

A greater percentage of Texas students with two or more CTE classes also pass the math and reading sections of the TAKS assessment. Table 4 indicates the percentages of students passing math and reading.

**Table 4: Percentage of Texas High School Students Passing TAKS Math and Reading Assessments**

		2013–2014	2014–2015	2015–2016	2016–2017
All Students	STAAR Algebra I	78%	79%	78%	83%
	STAAR English II	79%	70%	67%	66%
Students Participating in a CTE program	STAAR Algebra I	95%	94%	95%	95%
	STAAR English II	96%	97%	92%	93%

Source: Texas Education Agency, State AEIS Report

**Concluding Comments**

CTE prepares students for successful careers and further education by providing the technical knowledge and skills that are aligned with academic standards. For this reason, the Council and its partner agencies view CTE as critical for the workforce development system. Because CTE is a key component of the state’s workforce system and the strategic plan for that system, the Council will continue to monitor CTE throughout the state.

# Texas Workforce Investment Council

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