

# The Impact of Career and Technical Education on Postsecondary Outcomes in Nebraska and South Dakota

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# The Impact of Career and Technical Education on Postsecondary Outcomes in Nebraska and South Dakota

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Education leaders in Nebraska and South Dakota partnered with the Regional Educational Laboratory Central to examine how completing a sequence of career and technical education (CTE) courses in high school affects students' rates of on-time high school graduation and their rates of postsecondary education enrollment and completion within two and five years. The study found that CTE concentrators (students who complete a sequence of CTE courses aligned to a specific career field such as manufacturing or education and training) were 7 percentage points more likely than non-CTE concentrators to graduate from high school on time and 10 percentage points more likely to enroll in any type of postsecondary education within two years of their expected high school graduation year. The study also found that CTE concentrators were 3 percentage points more likely than non-CTE concentrators to earn a postsecondary award, such as a professional certificate, diploma, or associate's or bachelor's degree, within five years of their expected high school graduation year. CTE concentrators were 4 percentage points more likely than non-CTE concentrators to obtain up to an associate's degree as their highest postsecondary award within five years of their expected high school graduation year but 1 percentage point less likely to obtain a bachelor's degree or higher.

## Why this study?

State and local education agency leaders are focusing on broadening and strengthening career and technical education (CTE) programs to increase students' success after high school. CTE programs are broadly defined as programs that offer high school courses aligned to specific career fields and that provide students with the academic and technical skills to succeed in college or the workforce (Dougherty, 2016). Participation in CTE programs has been associated with decreased dropout rates as well as increased rates of high school attendance, college enrollment, and employment (Dougherty, 2016, 2018; Lee et al., 2016).

Recently, federal and state policymakers have also focused on improving CTE programs. In 2018 the Strengthening Career and Technical Education for the 21st Century Act (Perkins V) committed federal funds to support CTE programming across the country (Advance CTE & Association for Career and Technical Education, 2019). From 2017 to 2018, more than 300 bills concerning CTE were introduced at the state level, and 87 bills were enacted across 32 states (Keily, 2019). These bills ranged from providing additional state funds for CTE programs to establishing programs to increase student awareness of and access to CTE programs.

This increased attention is also apparent in the seven-state region served by the Regional Educational Laboratory Central. For example, state education agencies in Nebraska and South Dakota have enacted CTE-related policies or programs intended to strengthen state collaboration with in-demand workforce fields and reduce gaps between workforce needs and graduating students' skills. The Nebraska Department of Education (n.d.) is collaborating with the Nebraska Department of Labor and Department of Economic Development on the reVISION initiative, which supports districts and community colleges in strengthening CTE programs, including aligning those programs with current workforce needs. Similarly, the Division of Career and Technical Education of the South Dakota Department of Education (n.d.) has developed state- and local-level processes to help schools more easily

For additional information, including background on the study, technical methods, detailed analysis results, and analyses by state, access the report appendixes at <https://go.usa.gov/xHn39>.

understand current and future workforce needs and align programs along the secondary-postsecondary-career continuum.

As states continue to expand and integrate CTE programs, research plays an important role in illuminating the impact of student participation in CTE programs on education outcomes. Because postsecondary awards such as professional certificates, diplomas, and academic degrees are increasingly important for accessing career opportunities, attainment of these awards might serve as a rough indicator of future career success. Examining the impacts of student participation in CTE programs is also important because CTE participation might have different effects on short-term postsecondary education outcomes (for example, those that occur within two years of high school graduation) and longer-term postsecondary education outcomes (for example, those that occur within five years of high school graduation). However, rigorous research examining the impact of CTE programs is lacking, particularly on outcomes that occur several years after high school graduation.

Understanding the value of investigating students' CTE outcomes, stakeholders from the Nebraska Department of Education and the South Dakota Department of Education partnered with the Regional Educational Laboratory Central to explore the short- and longer-term education impacts of CTE participation among students in Nebraska and South Dakota who become CTE concentrators. A CTE concentrator is a student who takes a sequence of two or three CTE courses aligned to a specific career cluster (see box 1 for definitions of key terms). Across the 2012/13–2016/17 school years approximately 46 percent of students in Nebraska and 52 percent of students in South Dakota became CTE concentrators. Although all students can take individual CTE courses that span a variety of career clusters, the study partners believed that the postsecondary outcomes of CTE concentrators should be particularly strong because the CTE concentrators were, by definition, on identified career pathways that should support their transition to postsecondary education.

Because students can concentrate in a variety of career clusters whose related occupations likely have different education requirements for entry, the study partners were also interested in how students' education outcomes vary across career clusters. This information would allow the partners to assess the extent to which concentration rates in career clusters, as well as the percentage of CTE concentrators in each cluster who obtain a postsecondary award, align with their state workforce needs. For example, the highest percentage of CTE concentrators across Nebraska and South Dakota concentrated in the human services (15.4 percent) and the agriculture, food, and natural resources (14.6 percent) career clusters (see table C7 in appendix C for details on the number and percentage of CTE concentrators in each career cluster). Parents and students might also be interested in learning about the typical postsecondary trajectories of students who concentrate in each career cluster.

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### Box 1. Key terms

**Career cluster.** A grouping of occupations that are related by skills or products. CTE programs provided by schools and districts are designed to align to one or more of the 16 career clusters in the National Career Clusters Framework, including architecture and construction, finance, and information technology (Advance CTE, n.d.).

**Covariate.** A variable that has a relationship with the outcome variable that one wants to account for. For example, student demographic characteristics might be used as covariates to account for their influence on student postsecondary success.

**CTE concentrator.** A high school student who completed a sequence of courses aligned to a specific career cluster. In Nebraska only students who earned three or more credits in a single career cluster were considered CTE concentrators. In South Dakota only students who earned at least two credits in a state-approved sequence and in a single career cluster were considered CTE concentrators.

**Expected high school graduation year.** The year students are expected to graduate from high school based on four years after they first enrolled in grade 9.

**Postsecondary award.** Any award for educational attainment earned after high school. Postsecondary awards include professional certificates, diplomas, associate’s degrees, bachelor’s degrees, and advanced degrees but not industry certifications.

**Postsecondary award attainment rate.** The percentage of students who earn any type of postsecondary award. The rate is calculated based on whether students attained any type of postsecondary award within two years of and within five years of their expected high school graduation year.

**Postsecondary enrollment rate.** The percentage of students who enroll in any type of postsecondary education. The rate is calculated based on whether students enrolled in any type of postsecondary education within two years of and within five years of their expected high school graduation year.

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## Research questions

The study addressed the following research questions:

1. What is the impact of being a CTE concentrator on high school graduation, two-year and five-year postsecondary enrollment and completion, and type of postsecondary award attained?
2. How do high school graduation and two-year and five-year postsecondary outcomes vary by career cluster?

The study team used data from students in Nebraska and South Dakota whose expected high school graduation year was between 2012/13 and 2016/17. The team examined five-year postsecondary outcomes only for students whose expected high school graduation year was 2012/13 or 2013/14. Box 2 summarizes the data sources, sample, and methods used in the study, and appendix B provides additional detail.

The study team was unable to examine the impact of being a CTE concentrator on workforce outcomes, including employment status and quarterly wages. During the study design process the team determined that the infrastructure to link education data to workforce data was not currently available. This was unfortunate because the conceptual arguments in favor of CTE suggest that participating in CTE programs can improve workforce outcomes—for example, relatively well-paying technical careers—that do not require a bachelor’s degree (see appendix A). Previous research has linked participation in CTE programs to higher employment rates and increased wages after high school (Dougherty, 2016). Additionally, some research has suggested that the benefits of CTE participation might fade over time if the preparation students receive is too narrow to support their development of transferable skills (Hanushek et al., 2017). In this regard, examining five-year employment outcomes would provide a much clearer picture of the overall impact of CTE coursetaking.

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### Box 2. Data sources, sample, and methods

This impact study was designed to meet What Works Clearinghouse (2020) group design standards (version 4.1) with reservations and to align with the *Review Protocol for Studies of Interventions to Support the Transition to College* (What Works Clearinghouse, 2016). The study team used a quasi-experimental design (that is, a study design that does not assign students to groups randomly) to compare the education outcomes of career and technical education (CTE) concentrators and non-CTE concentrators. The team conducted additional descriptive analyses to examine how education outcomes varied by the career clusters that CTE concentrators concentrated in.

**Data sources.** The study team used existing data collected by the Nebraska Department of Education and the South Dakota Department of Education. CTE participation data included high school students’ status as CTE concentrators or non-CTE concentrators as well as the career clusters of the concentrators. Additional data included students’ expected four-year high school graduation year, based on the year they first enrolled in grade 9; student demographics, including gender, race/ethnicity, grade 8 English learner status, grade 8 eligibility for the national school lunch program, and grade 8 special education status; grade 8 math and reading state assessment results; district locale (for example, town or city); percentage of district students eligible for the national school lunch program; number of career clusters addressed by a district’s CTE programming; and on-time (four-year) high school graduation status.

The Nebraska Department of Education and the South Dakota Department of Education collected postsecondary outcome data through the National Student Clearinghouse and shared these data with the study team. These data included students' postsecondary enrollment status, postsecondary completion status, and postsecondary award type attained. These data indicated whether students had ever enrolled in or completed any kind of postsecondary education within two years of and within five years of their expected high school graduation year. For students who attained a postsecondary award, these data included the type of certificate, diploma, or degree earned. The data were used to categorize students as having attained any kind of postsecondary award within two years of their expected high school graduation year. When looking at five-year postsecondary outcomes, the study team also used these data to categorize students as having attained any kind of postsecondary award as well as either having attained a postsecondary award up to an associate's degree (a professional certificate, diploma, or associate's degree) or having attained a bachelor's degree or higher (a bachelor's degree or graduate degree). The dataset did not allow the team to conduct analyses that distinguished among a professional certificate, diploma, and associate's degree. Data on students who attained a bachelor's degree or higher were combined because of the small number of students who attained a graduate degree within five years. See appendix B for additional information about the data used in this study.

Although the study team did not examine the number of CTE courses students took or the number of CTE credits they earned, some proportion of CTE concentrators likely took more CTE courses than required to become a CTE concentrator, and some proportion of non-CTE concentrators likely took one or more CTE courses. During the 2018/19 school year about 71 percent of secondary students in Nebraska took at least one CTE course (K. Graham, personal communication, August 4, 2020), and 45 percent of secondary students in South Dakota did so (L. Scheibe, personal communication, July 30, 2020).

**Sample.** The study sample included students in Nebraska and South Dakota whose four-year expected high school graduation year was between 2012/13 and 2016/17. Because randomly assigning students to be CTE concentrators or non-CTE concentrators was not possible, the study team used propensity score matching to identify a comparison group of non-CTE concentrators based on demographic characteristics and grade 8 state assessment results similar to those of the CTE concentrators. Demographic characteristics used to match non-CTE concentrators to CTE concentrators included gender, race/ethnicity, grade 8 eligibility for the national school lunch program, grade 8 special education status, district locale, and percentage of district students eligible for the national school lunch program. CTE concentrators were matched only to non-CTE concentrators who were from the same state and who had the same expected high school graduation year.

The sample used to examine the impact of being a CTE concentrator on high school graduation and two-year postsecondary outcomes was composed of 112,764 students (56,382 CTE concentrators and 56,382 non-CTE concentrators). The sample used to examine the impact of being a CTE concentrator on five-year postsecondary outcomes was composed of 42,398 students (21,199 CTE concentrators and 21,199 non-CTE concentrators), which included only students from the 2012/13 and 2013/14 graduation cohorts. This sample was smaller than the one used to examine two-year outcomes because five-year outcome data were not yet available for the later cohorts.

Baseline equivalence for both two-year and five-year student samples was established through analyses of students' baseline (that is, prestudy) data, which showed statistically similar achievement and demographic patterns between the CTE concentrator and non-CTE concentrator groups. Although statistically similar on these variables, the groups might have differed on unobserved variables that could have influenced the study outcomes, such as intrinsic motivation or level of family support. See appendix B for additional details on the development of the study sample and the sample's characteristics.

**Methodology.** The study team used logistic regression to examine the impact of being a CTE concentrator on high school graduation, postsecondary enrollment and completion, and type of postsecondary award attained. Logistic regression is a statistical analysis that can be used to examine a program's impact on a dichotomous outcome such as high school graduation status. Covariates used in the analyses included student demographics, grade 8 state assessment results, district locale, percentage of district students eligible for the national school lunch program, number of career clusters addressed by a district's CTE programming, student graduation cohort, and state.

The study team used separate descriptive analyses (methods that describe or summarize data for a sample) to examine the percentage of students who concentrated in each of the 16 career clusters and who achieved each of the study outcomes. Detailed results of primary and secondary analyses are in appendix C. Results for Nebraska are in appendix D, and results for South Dakota are in appendix E.

## Findings

The impacts of being a CTE concentrator in Nebraska and South Dakota (research question 1) are presented first, followed by a descriptive examination of the outcomes for students who concentrated in each career cluster (research question 2).

### *Impacts of being a career and technical education concentrator*

The results of analyses examining the impacts of being a CTE concentrator in Nebraska and South Dakota (research question 1) are summarized first, followed by a more detailed discussion of the results associated with each outcome, presented as marginal effects. Marginal effects can be roughly interpreted as the percentage point greater or lesser likelihood of a CTE concentrator achieving a key outcome after CTE concentrators' and non-CTE concentrators' prior academic achievement and demographic characteristics are accounted for. The percentages of CTE concentrators and non-CTE concentrators who achieved each education outcome are in tables C1 and C2 in appendix C.

*CTE concentrators were more likely than non-CTE concentrators to attain most short- and longer-term outcomes.* After students' background characteristics were accounted for, CTE concentrators were more likely than non-CTE concentrators to graduate from high school on time and to have better short-term postsecondary outcomes (table 1). Although CTE concentrators generally had better longer-term postsecondary outcomes than non-CTE concentrators did, CTE concentrators were slightly less likely than non-CTE concentrators to obtain a bachelor's degree or higher during the study period.

*CTE concentrators were more likely than non-CTE concentrators to graduate from high school on time.* CTE concentrators were 7 percentage points more likely than non-CTE concentrators to graduate from high school on time (see table C4 in appendix C).

*CTE concentrators were more likely than non-CTE concentrators to enroll in postsecondary education.* CTE concentrators had a 10 percentage point greater likelihood of postsecondary enrollment within two years of their expected high school graduation year and an 8 percentage point greater likelihood of postsecondary enrollment within five years (see tables C4 and C5 in appendix C). Postsecondary enrollment included being enrolled full- or part-time in a professional certificate program, a diploma-granting program, or a two-year or four-year institution. Secondary analyses examining the impact of being a CTE concentrator on full-time postsecondary enrollment and on enrollment at both two-year and four-year postsecondary institutions are in appendix C.

**Table 1. The likelihood of achieving short-term and longer-term education outcomes tended to be greater for career and technical education concentrators than for non-career and technical education concentrators**

Outcome	Percentage point difference for CTE concentrators
On-time high school graduation	+7
Postsecondary enrollment within two years	+10
Postsecondary enrollment within five years	+8
Postsecondary attainment within two years	+2
Postsecondary attainment within five years	+3
Attaining up to an associate's degree as their highest postsecondary award within five years	+4
Attaining a bachelor's degree or higher as their highest postsecondary award within five years	-1

CTE is career and technical education.

Note: Numbers are marginal effects and represent the percentage point greater or lesser likelihood of CTE concentrators achieving an outcome. All differences between CTE and non-CTE concentrators were statistically significant. Five-year outcomes were assessed only for students whose expected high school graduation year was 2012/13 or 2013/14.

Source: Authors' analysis of data provided by the Nebraska Department of Education and the South Dakota Department of Education for students whose expected high school graduation year was between 2012/13 and 2016/17.

*CTE concentrators were more likely than non-CTE concentrators to earn any kind of postsecondary award within two years of and within five years of their expected high school graduation year.* CTE concentrators were 2 percentage points more likely than non-CTE concentrators to earn any kind of postsecondary award within two years of their expected high school graduation year and 3 percentage points more likely to do so within five years (see tables C4 and C5 in appendix C). Postsecondary award attainment included earning a professional certificate, diploma, associate's degree, bachelor's degree, or graduate degree.

*CTE concentrators were more likely than non-CTE concentrators to attain a postsecondary award up to an associate's degree but slightly less likely to attain a bachelor's degree or higher within five years of their expected high school graduation year.* CTE concentrators were 4 percentage points more likely than non-CTE concentrators to attain a professional certificate, diploma, or associate's degree as their highest postsecondary award within five years of their expected high school graduation year. However, CTE concentrators were 1 percentage point less likely than non-CTE concentrators to attain a bachelor's degree or higher within five years (see table C5 in appendix C).

### ***Education outcomes associated with each career cluster***

This section describes the results of descriptive analyses examining the high school graduation and postsecondary outcomes for students who concentrated in each career cluster (research question 2). In addition to showing high school graduation rates for each career cluster, these findings describe the postsecondary trajectories of students who concentrated in each career cluster. Findings are presented as the percentage of students in each career cluster who achieved each of the outcomes and are compared with the average percentages across all CTE concentrators and non-CTE concentrators in Nebraska and South Dakota.

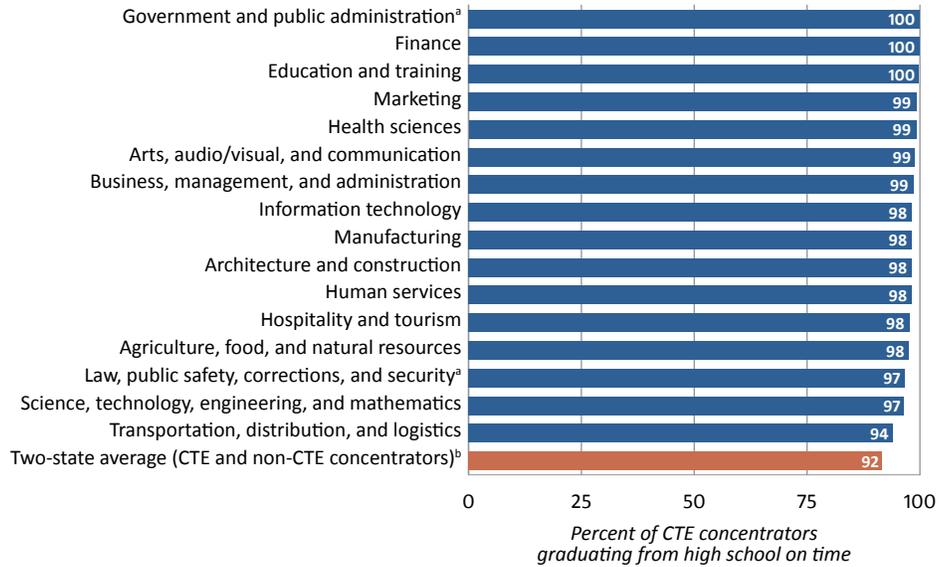
*High school graduation rates for CTE concentrators were consistently high, regardless of career cluster.* A vast majority (94 percent or more) of CTE concentrators in each career cluster graduated from high school on time (figure 1). These percentages were above the two-state average for all CTE concentrators and non-CTE concentrators in Nebraska and South Dakota (92 percent, represented by the orange bar in figure 1).

*Students who concentrated in finance, marketing, health sciences, and government and public administration had the highest two-year and five-year postsecondary enrollment rates.* The percentage of CTE concentrators who enrolled in any kind of postsecondary education within two years of their expected high school graduation year was highest among students who concentrated in finance (86 percent), marketing (85 percent), government and public administration (85 percent), and health sciences (85 percent; figure 2). The two-year postsecondary enrollment rate was lowest among students who concentrated in transportation, distribution, and logistics (51 percent); manufacturing (61 percent); and hospitality and tourism (64 percent). For the majority of career clusters, two-year postsecondary enrollment rates among CTE concentrators were higher than the two-state average for Nebraska and South Dakota (69 percent, represented by the orange bar in figure 2).

The five-year postsecondary enrollment rate for CTE concentrators was higher than the two-state average (73 percent) in all but four career clusters (figure 3). The percentage of CTE concentrators who enrolled in any kind of postsecondary education within five years of their expected high school graduation year was highest among those who concentrated in marketing (90 percent), health sciences (89 percent), finance (88 percent), and government and public administration (88 percent). The five-year postsecondary enrollment rate was lowest among students who concentrated in transportation, distribution, and logistics (57 percent) and manufacturing (66 percent).

Students who concentrated in marketing, health science, finance, and government and public administration had the highest postsecondary enrollment rates both two and five years after their expected high school graduation year. Postsecondary enrollment rates across both time spans were lowest for students who concentrated in transportation, distribution, and logistics and in manufacturing.

**Figure 1. High school graduation rates among career and technical education concentrators were consistently high across career clusters**



CTE is career and technical education.

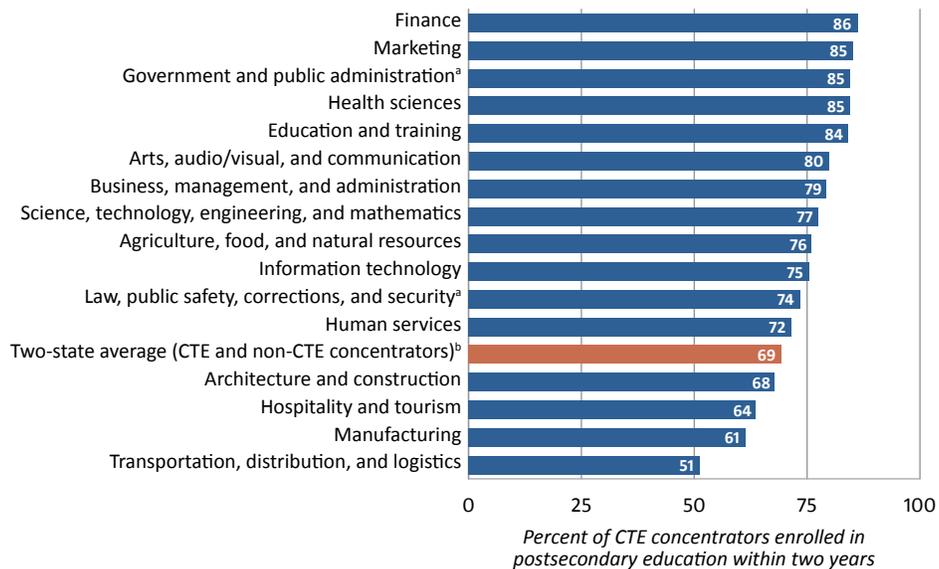
Note: Numbers are raw percentages.

a. Only students from the Nebraska sample concentrated in this career cluster.

b. Calculated from all CTE concentrators and non-CTE concentrators in Nebraska and South Dakota who were included in the study's analytic sample.

Source: Authors' analysis of data provided by the Nebraska Department of Education and the South Dakota Department of Education for students whose expected high school graduation year was between 2012/13 and 2016/17.

**Figure 2. The two-year postsecondary enrollment rate among career and technical education concentrators was highest for those who concentrated in finance**



CTE is career and technical education.

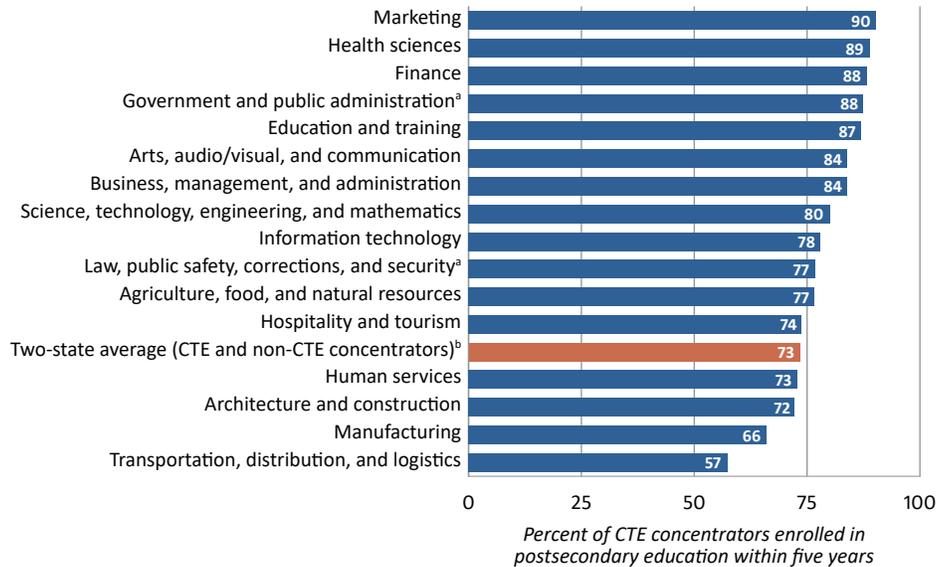
Note: Numbers are raw percentages.

a. Only students from the Nebraska sample concentrated in this career cluster.

b. Calculated from all CTE concentrators and non-CTE concentrators in Nebraska and South Dakota who were included in the study's analytic sample.

Source: Authors' analysis of data provided by the Nebraska Department of Education and the South Dakota Department of Education for students whose expected high school graduation year was between 2012/13 and 2016/17.

**Figure 3. The five-year postsecondary enrollment rate among career and technical education concentrators was highest for those who concentrated in marketing**



CTE is career and technical education.

Note: Numbers are raw percentages.

a. Only students from the Nebraska sample concentrated in this career cluster.

b. Calculated from all CTE concentrators and non-CTE concentrators in Nebraska and South Dakota who were included in the study's analytic sample.

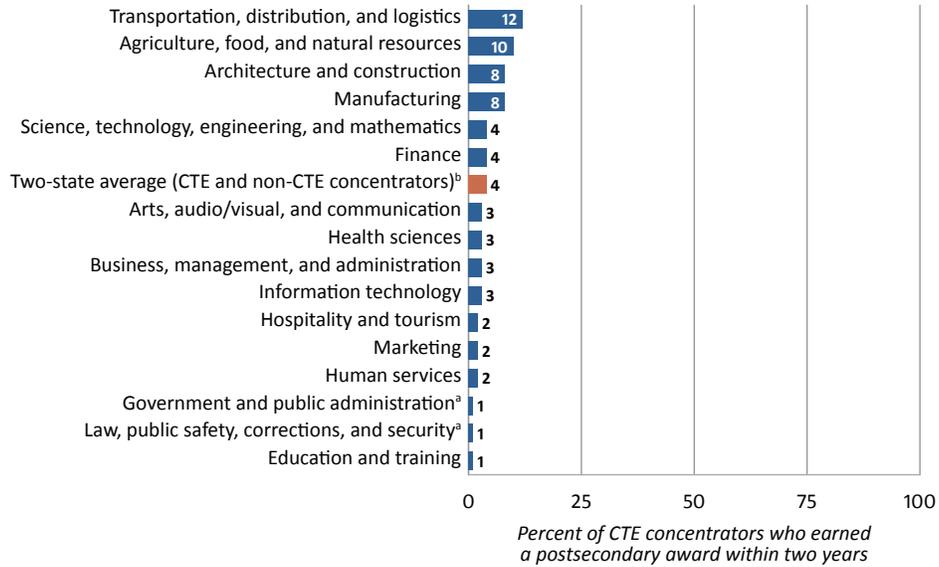
Source: Authors' analysis of data provided by the Nebraska Department of Education and the South Dakota Department of Education for students whose expected high school graduation year was 2012/13 or 2013/14.

*Students who concentrated in transportation, distribution, and logistics had the highest two-year postsecondary award attainment rate but the third lowest five-year attainment rate.* The percentage of CTE concentrators who earned any kind of postsecondary award within two years of their expected high school graduation year was highest among those who concentrated in transportation, distribution, and logistics (12 percent); agriculture, food, and natural resources (10 percent); architecture and construction (8 percent); and manufacturing (8 percent; figure 4). These rates were above the two-state average (4 percent, represented by the orange bar in figure 4). The two-year postsecondary award attainment rate was lowest (1 percent each) among students who concentrated in education and training; law, public safety, corrections, and security; and government and public administration.

The CTE concentrators most likely to have earned any kind of postsecondary award within five years of their expected high school graduation year were those who had concentrated in government and public administration (57 percent), finance (52 percent), and marketing (50 percent; figure 5). The five-year postsecondary award attainment rate was lowest among students who concentrated in hospitality and tourism (22 percent); transportation, distribution, and logistics (25 percent); and manufacturing (25 percent). CTE concentrators in 8 of the 16 career clusters had a higher five-year postsecondary award attainment rate than the two-state average (37 percent, represented by the orange bar in figure 5).

*The types of postsecondary awards CTE concentrators attained within five years of their expected high school graduation year varied by the career cluster they concentrated in.* The percentage of CTE concentrators who earned a bachelor's degree or higher within five years of their expected high school graduation year was highest among those who concentrated in government and administration (55 percent) and marketing (46 percent). The percentage of CTE concentrators who earned up to an associate's degree as their highest postsecondary award within five years of their expected high school graduation year was lowest among those who concentrated in the same two career clusters (2 percent for government and public administration and 4 percent for marketing; figure 6). The percentage of CTE

**Figure 4. The two-year postsecondary award rate among career and technical education concentrators was highest for those who concentrated in transportation, distribution, and logistics**



CTE is career and technical education.

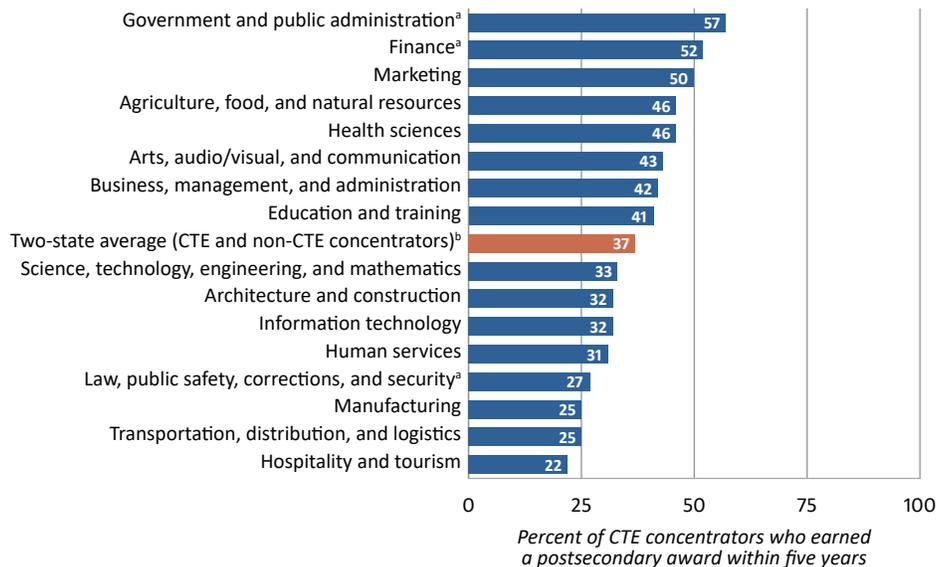
Note: Numbers are raw percentages.

a. Only students from the Nebraska sample concentrated in this career cluster.

b. Calculated from all CTE concentrators and non-CTE concentrators in Nebraska and South Dakota who were included in the study's analytic sample.

Source: Authors' analysis of data provided by the Nebraska Department of Education and the South Dakota Department of Education for students whose expected high school graduation year was between 2012/13 and 2016/17.

**Figure 5. The five-year postsecondary award rate among career and technical education concentrators was highest for those who concentrated in government and public administration**



CTE is career and technical education.

Note: Numbers are raw percentages.

a. No South Dakota students in the five-year sample concentrated in this career cluster.

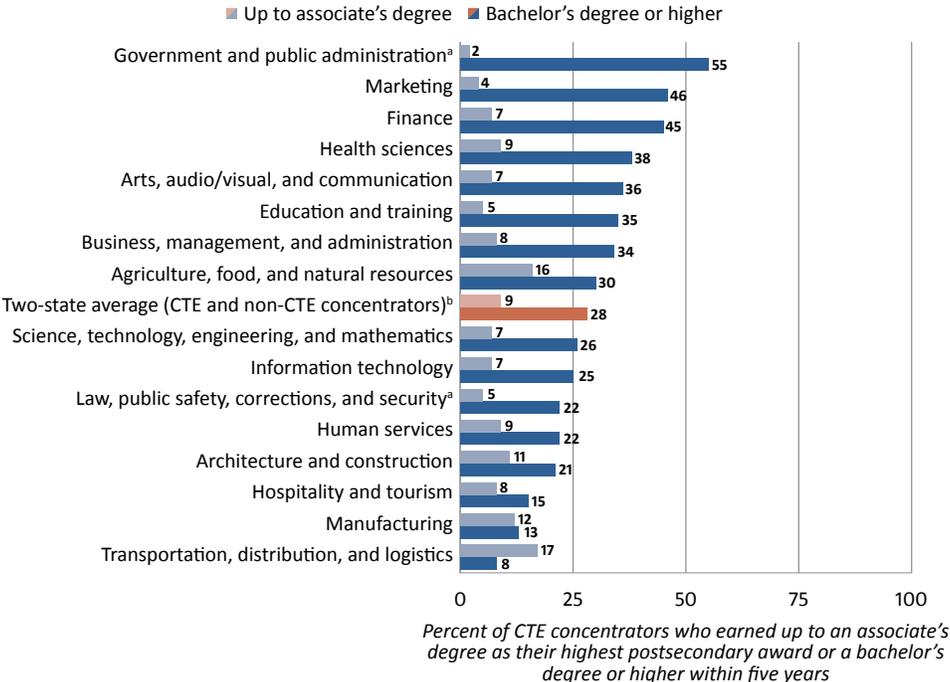
b. Calculated from all CTE concentrators and non-CTE concentrators in Nebraska and South Dakota who were included in the study's analytic sample.

Source: Authors' analysis of data provided by the Nebraska Department of Education and the South Dakota Department of Education for students whose expected high school graduation year was 2012/13 or 2013/14.

concentrators who earned up to an associate’s degree as their highest postsecondary award within five years was highest among those who concentrated in transportation, distribution, and logistics (17 percent). This career cluster also had the lowest percentage of students who earned a bachelor’s degree or higher within five years (8 percent). In 8 of the 16 career clusters, the percentage of CTE concentrators who earned at least a bachelor’s degree was higher than the two-state average (28 percent, represented by the solid orange bar in figure 6). In 4 of the 16 career clusters, the percentage of CTE concentrators who attained up to an associate’s degree as their highest postsecondary award was higher than the two-state average (9 percent, represented by the patterned orange bar in figure 6).

Pathways to specific careers likely require varying levels of postsecondary education. Some career pathways might require at least a bachelor’s degree for entry into the workforce, whereas other pathways might require some type of professional certification or diploma. For example, low percentages of CTE concentrators in finance, government and public administration, and marketing received a postsecondary award within two years of their expected high school graduation year (see figure 4), but the highest percentages of CTE concentrators in those three career clusters earned a bachelor’s degree or higher within five years of their expected high school graduation year. Conversely, even though the transportation, distribution, and logistics career cluster had the lowest percentage of CTE concentrators who earned a bachelor’s degree within five years of their expected high school graduation year, it had the highest percentage of CTE concentrators who attained any postsecondary award within two years.

**Figure 6. Among career and technical education concentrators, those who concentrated in government and public administration were least likely to attain up to an associate’s degree as their highest postsecondary award and most likely to attain a bachelor’s degree or higher within five years of their expected high school graduation year**



CTE is career and technical education.

Note: Numbers are raw percentages.

- a. Only students from the Nebraska sample concentrated in this career cluster.
- b. Calculated from all CTE concentrators and non-CTE concentrators in Nebraska and South Dakota who were included in the study’s analytic sample.

Source: Authors’ analysis of data provided by the Nebraska Department of Education and the South Dakota Department of Education for students whose expected high school graduation year was 2012/13 or 2013/14.

## Implications

The study's finding of a large, positive impact of being a CTE concentrator on on-time high school graduation and on short-term postsecondary enrollment and completion provides evidence that state and local education agency leaders can consider when deciding whether to fund, strengthen, or expand CTE programming. Additionally, becoming a CTE concentrator might lead to a considerably greater likelihood of students completing a professional certificate, diploma, or associate's degree, though it might lead to a marginally lesser likelihood of students earning a bachelor's degree within five years of their expected high school graduation year. Although CTE programming, previously called vocational education, has historically been viewed as less academically rigorous and less likely than traditional high school coursework to lead to positive postsecondary student outcomes (Malkus, 2019), the results of this study challenge those notions. Given that students who become CTE concentrators have better short-term postsecondary education success and are on a par with non-CTE concentrators in the longer term, future research might examine how these trends translate to workforce outcomes such as subsequent employment rates and wages.

Students and their families can use the results of this study when deciding whether and how to participate in CTE programs. For example, students and their families might refer to the postsecondary enrollment rates and postsecondary award attainment rates associated with the 16 career clusters to understand typical patterns in postsecondary enrollment and completion. If a student wished to concentrate in CTE and pursue a bachelor's degree after high school, it might be helpful for that student to understand which career clusters are associated with higher rates of bachelor's degree attainment in Nebraska and South Dakota and which career clusters are not.

Given the variability in postsecondary enrollment and attainment rates across career clusters, education leaders might consider how their CTE programs align with local, regional, and state workforce needs. They might also examine the extent to which postsecondary award attainment rates align with their understanding of the education requirements for entry into specific career fields. Leaders might find misalignment between the number of CTE concentrators in each career cluster and workforce needs (see table C7 in appendix C for participation rates in each career cluster) as well as between the types of postsecondary awards CTE concentrators in each cluster attain and the education requirements of those fields. If there is misalignment, leaders might wish to promote development of and participation in career clusters related to areas of greatest workforce need. The study findings might also prompt leaders to ensure that catalysts and opportunities are in place to support postsecondary transitions (for example, dual credit opportunities) and that barriers to relevant postsecondary education are removed (for example, completion of the Free Application for Federal Student Aid), particularly in fields in which postsecondary education misalignment is identified.

Further research on CTE participation is needed to inform potential impacts that were not examined in this study. For instance, examining workforce trends could illustrate whether the short-term impacts of becoming a CTE concentrator on education outcomes are also accompanied by impacts on wages. Additionally, examining outcomes of student subgroups might inform strategic supports for historically disadvantaged students in order to address postsecondary education outcome gaps.

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