Career and Technical Education in the United States

Among 2013 public high school graduates ever enrolled in postsecondary education by June 2021, a higher percentage of high school career and technical education (CTE) concentrators than nonconcentrators had received an associate's degree as their highest postsecondary degree (14 vs. 9 percent). Conversely, a lower percentage of CTE concentrators than nonconcentrators had received a bachelor's or higher degree as their highest postsecondary degree (48 vs. 54 percent).

Introduction

Career and technical education (CTE) is defined as courses (at the high school level) and programs (at the postsecondary subbaccalaureate level) that focus on the skills and knowledge required for specific jobs or fields of work.^{1, 2} The Carl D. Perkins Career and Technical Education Act of 2006, as amended by the Strengthening Career and Technical Education for the 21st Century Act (Perkins V), reflects a commitment by the federal government to support CTE programs in the United States.³ Generally, the goal of this legislation is to improve access to CTE and improve the experiences and outcomes of CTE learners at the high school and postsecondary levels.⁴

This indicator presents data from a variety of sources that allow for an exploration of the state of CTE in the United States, primarily at the high school and postsecondary levels.⁵ It first examines data on CTE teachers, to provide a sense of CTE availability and resources, then presents the most recent data on secondary CTE participation, before turning to trends in completion of postsecondary CTE credentials. Finally, this indicator connects secondary and postsecondary CTE experiences by looking at the postsecondary outcomes of a cohort of high school CTE participants about 8 years after high school graduation.

Specifically, this indicator first uses data from the Schools and Staffing Survey (SASS) and the National Teacher and Principal Survey (NTPS) to examine the extent to which elementary and secondary schools experienced difficulty in filling open teaching positions in CTE in school years 2011-12 and 2020-21 and whether there are differences in education and teaching experience between teachers whose main teaching assignment was CTE and those whose main teaching assignment was in other fields in school year 2020-21. In 2020-21, among public schools hiring for at least one position, 31 percent had difficulty or were unable to fill open positions in CTE. Additionally, among public school teachers of grades 9-12, a higher percentage of CTE teachers than of teachers in many other fields were among the newest to the profession (i.e., had less than 3 years of experience).

Next, using the most recent data from the National Assessment of Educational Progress (NAEP) High School Transcript Study (HSTS), this indicator explores CTE coursetaking by CTE subject area and graduate characteristics, such as sex, race/ethnicity, English learner (EL) status, and the locale of their high school (cities, suburbs, towns, and rural areas).⁶ Data from the Integrated Postsecondary Education Data System (IPEDS) are then used to explore trends in completion of subbaccalaureate postsecondary degrees by CTE field between 2011-12 and 2021-22. These data show that a majority of 2019 high school graduates took at least one CTE course (85 percent). Additionally, they show that business and marketing was among the most common CTE fields of study at the high school and subbaccalaureate levels, with more than 20 percent of 2019 high school graduates taking at least one business and marketing course and over 100,000 awards conferred each in 2021-22 at the certificate and associate's degree levels.⁷

Finally, the last section of this indicator uses data from the Postsecondary Education Administrative Records Collection (PEAR) of the High School Longitudinal Study of 2009 (HSLS:09) to examine postsecondary outcomes among high school CTE concentrators and nonconcentrators in June 2021, about 8 years after they graduated high school.⁸ Among fall 2009 ninth-graders who graduated from public high schools by 2013 and who ever enrolled in postsecondary education, these data show that a higher percentage of CTE concentrators than nonconcentrators had received an associate's degree as their highest postsecondary degree (14 vs. 9 percent). Conversely, a lower percentage of CTE concentrators than nonconcentrators had received a bachelor's or higher degree as their highest postsecondary degree (48 vs. 54 percent).⁹

Staffing Challenges and Qualifications of CTE Teachers

Public and Private Schools Hiring for or Having Difficulties Filling Open Teaching Positions in CTE

Data from the 2020-21 NTPS, when examined together with data from the 2011-12 SASS, allow for comparisons over time in the percentage of elementary and secondary schools that had open teaching positions. Among public schools hiring for at least one position schoolwide, a higher percentage reported hiring in the CTE subject-matter field in school year 2020-21 (24 percent) than in 2011-12 (20 percent). Similarly, among private schools with at least one opening across subject-matter fields schoolwide, a higher percentage reported hiring in the CTE field in 2020-21 (16 percent) than in 2011-12 (8 percent).

In 2020-21, during the first full school year of the coronavirus pandemic, 31 percent of public schools hiring for open teaching positions in CTE reported having difficulties or being unable to fill the opening (hereafter, "difficulty filling an opening"), which was higher than the 20 percent in 2011-12. In 2020-21, this percentage was higher than the percentages of public schools that reported difficulty filling an opening in social studies, physical education or health, general elementary, English or language arts, and music or art (ranging from 11 to 23 percent), but lower than the percentages that reported difficulty filling an opening in physical sciences, special education, and foreign languages (37, 40, and 42 percent, respectively). Among private schools, there was no measurable difference between the percentage of schools in 2020-21 and in 2011-12 that reported having difficulties filling an opening in the CTE field (22 percent in 2020-21).

Public School Teachers' Years of Experience and Highest Degree Earned by Field of Main Teaching Assignment

FIGURE 1.

Percentage of public school teachers of grades 9 through 12 with less than 3 years of teaching experience, by field of main teaching assignment: School year 2020–21



Field of main teaching assignment

NOTE: "Years of teaching experience" refers to the number of years the respondent had worked as a teacher, either full-time or part-time. Figures are plotted based on unrounded data. SOURCE: U.S. Department of Education, National Center for Education Statistics, National Teacher and Principal Survey (NTPS), "Public School Teacher Data File,"

SOURCE: U.S. Department of Education, National Center for Education Statistics, National Teacher and Principal Survey (NTPS), "Public School Teacher Data File," 2020–21. See Digest of Education Statistics 2022, table 209.50.

In 2020-21, some 11 percent of all public school teachers of grades 9-12 taught CTE as their main teaching assignment (hereafter, "CTE teachers"). Of these public school CTE teachers,

- 10 percent had less than 3 years of teaching experience;¹⁰
- 29 percent had 3 to 9 years of teaching experience;
- 36 percent had 10 to 20 years of teaching experience; and
- 25 percent had over 20 years of teaching experience.

There were few measurable differences in the percentages of grade 9-12 public school teachers with 3 or more years of experience (i.e., 3 to 9 years, 10 to 20 years, and over 20 years) between CTE teachers and teachers whose main assignment was in other fields. However, the percentage with less than 3 years of teaching experience was higher for those whose main teaching assignment was CTE (10 percent) than for those whose main teaching assignment was

- English and language arts (7 percent);
- "all other" fields¹¹ (7 percent);
- natural sciences (6 percent);
- mathematics and computer science (6 percent);
- foreign languages (5 percent); and
- special education (5 percent).

In other words, a higher percentage of CTE teachers were among the newest to the profession compared with teachers in many other fields.

Looking at teachers' highest education level, not all teachers enter the profession with an advanced teaching degree. Compared with grade 9-12 public school teachers overall, a higher percentage of grade 9-12 public school CTE teachers had less than a bachelor's degree as their highest degree and lower percentages had a master's degree or an education specialist degree as their highest degree. Specifically,

- 13 percent of CTE teachers had less than a bachelor's degree as their highest degree versus 2 percent of teachers overall;
- 44 percent of CTE teachers had a master's degree as their highest degree versus 54 percent of teachers overall; and
- 6 percent of CTE teachers had an education specialist degree as their highest degree versus 8 percent of teachers overall.¹²

The percentages of grade 9-12 public school CTE teachers who had a bachelor's degree (35 percent) or a doctor's degree (1 percent) as their highest degree did not differ measurably from the percentages for grade 9-12 public school teachers overall.

Participation in CTE During High School

Participation in CTE During High School by CTE Field

The 2019 NAEP HSTS provides insight into participation in CTE courses among 2019 high school graduates. Graduates were considered to have taken a CTE course in a particular subject area if they had earned at least one Carnegie credit in that area.¹³ This section of the indicator looks at CTE courses in the following 12 subject areas¹⁴ and discusses the percentage of graduates who had earned at least one Carnegie credit in any of the 12 areas (referred to as those who had taken "any CTE courses" in this indicator):

- agriculture, food, and natural resources
- architecture and construction
- business and marketing
- · communication and audio/video technology
- engineering and technology
- health care sciences
- hospitality and tourism
- human services

- information technology
- manufacturing
- · public, protective, and government services
- transportation, distribution, and logistics

FIGURE 2.

Percentage of public and private high school graduates who earned at least one Carnegie credit in career and technical education (CTE) courses in high school, by subject area: 2019



NOTE: For a high school graduate to be included in the analyses, their transcript had to meet five requirements: (1) the graduate received either a standard or honors diploma, (2) the transcript had three or more years of delineated courses, (3) at least one course on the transcript was taken during the National Assessment of Educational Progress (NAEP) and High School Transcript Study (HSTS) assessment year, (4) the transcript contained 16 or more Carnegie credits, and (5) the transcript contained at least 1 Carnegie credit in English courses. The Carnegie unit is a standard of measurement that represents one credit for the completion of a 1-year course. Figures are plotted based on unrounded data.

SOURCE: U.S. Department of Education, National Center for Education Statistics, National Assessment of Educational Progress (NAEP), 2019 High School Transcript Study (HSTS). See Digest of Education Statistics 2022, table 225.25.

In 2019, some 85 percent of high school graduates had taken any CTE courses in these 12 subject areas. Of the 12 CTE subject areas, there were 3 subject areas in which more than 20 percent of high school graduates had taken at least one course:

- information technology (29 percent)
- human services (28 percent)
- business and marketing (21 percent)

There were five CTE subject areas in which less than 10 percent of high school graduates had taken at least one course:

- hospitality and tourism (8 percent)
- architecture and construction (6 percent)
- public, protective, and government services (5 percent)
- transportation, distribution, and logistics (4 percent)
- manufacturing (4 percent)

Participation in CTE During High School by Graduates' Characteristics

FIGURE 3.

Percentage of public and private high school graduates who earned at least one Carnegie credit in career and technical education (CTE) courses in high school, by selected characteristics: 2019



¹ Please visit NCES's Education Across America website for the definition of locale.

NOTE: For a high school graduate to be included in the analyses, their transcript had to meet five requirements: (1) the graduate received either a standard or honors diploma, (2) the transcript had three or more years of delineated courses, (3) at least one course on the transcript was taken during the National Assessment of Educational Progress (NAEP) and High School Transcript Study (HSTS) assessment year, (4) the transcript contained 16 or more Carnegie credits, and (5) the transcript contained at least 1 Carnegie credit in English courses. The Carnegie unit is a standard of measurement that represents one credit for the completion of a 1-year course. The Carnegie credits must have been earned in a career and technical education course in any of the following 12 subject areas: agriculture, food, and natural resources; architecture and construction; business and marketing; communication and audio/video technology; engineering and technology; health care sciences; hospitality and tourism; human services; information technology; manufacturing; public, protective, and government services; and transportation, distribution, and logistics. Race categories exclude persons of Hispanic ethnicity. Figures are plotted based on unrounded data. SOURCE: U.S. Department of Education, National Center for Education Statistics, National Assessment of Educational Progress (NAEP), 2019 High School Transcript Study (HSTS), retrieved January 22, 2024, from the NAEP Data Explorer (https://www.nationsreportcard.gov/ndecore/xplore/hsts).

In 2019, there were differences in CTE participation by high school graduates' characteristics, such as sex and race/ ethnicity and school locale. Specifically, a higher percentage of male than of female high school graduates had taken any CTE course (87 vs. 82 percent). The percentage of high school graduates who had taken any CTE course was highest for those from schools in rural areas (92 percent) and towns (91 percent), followed by those from schools in suburban areas (83 percent), and lowest for those from schools in cities (80 percent). In 2019, the percentage of high school graduates who had taken any CTE course was lower for those who were Asian than for those of most other racial/ethnic groups. The percentage of students who took any CTE course was

- 77 percent for Asian graduates;
- 82 percent for graduates of Two or more races;
- 83 percent for Hispanic graduates;
- 84 percent for Pacific Islander graduates (which was not measurably different from the percentage for Asian graduates);
- 86 percent for Black graduates;
- 86 percent for White graduates; and
- 87 percent for American Indian/Alaska Native graduates.

There was no measurable difference between the percentages of English Learner (EL) and non-EL high school graduates in 2019 who had taken any CTE course.

Trends in Completion of Subbaccalaureate Postsecondary Degrees and Certificates in CTE Fields

In the above section of the indicator, NAEP HSTS data were used to examine participation in CTE courses during high school. In this section, IPEDS data are used to examine completion of subbaccalaureate CTE programs at the certificate or associate's degree levels in the United States between 2011-12 and 2021-22.¹⁵

In 2021-22, a total of 1 million subbaccalaureate certificates¹⁶ and 1 million associate's degrees were conferred in the United States. At both levels, the percentage of awards conferred in a CTE field decreased from 2011-12 to 2021-22 (from 94 to 85 percent of certificates and from 59 to 50 percent of associate's degrees). Health sciences and business and marketing were the only CTE fields of study with over 100,000 awards conferred at both levels.

Subbaccalaureate Certificates

There were 888,300 subbaccalaureate certificates conferred in CTE fields in 2021-22, which was 4 percent lower than in 2011-21 (930,000). In 2021-22, the following CTE fields of study made up more than 10 percent each of certificates conferred in any CTE field:

- health sciences (30 percent of CTE certificates)
- manufacturing, construction, repair, and transportation (21 percent of CTE certificates)
- consumer services (17 percent of CTE certificates)
- business and marketing (12 percent of CTE certificates)

The remaining 7 of 11 CTE fields of study accounted for a combined 19 percent of CTE certificates.

FIGURE 4.

Number of subbaccalaureate certificates conferred by postsecondary institutions in career and technical education (CTE), by field of study: Academic years 2011–12 and 2021–22



NOTE: Data are for the 50 states and the District of Columbia. The fields shown are the 11 programs counted as occupational fields in postsecondary taxonomy categories (https://nces.ed.gov/surveys/ctes/tables/postsec_tax.asp). Data are for postsecondary institutions participating in Title IV federal financial aid programs. Figures are plotted based on unrounded data.

SOURCE: U.S. Department of Education, National Center for Education Statistics, Integrated Postsecondary Education Data System (IPEDS), Completions component, Fall 2011 (final data) and Fall 2021 (provisional data), retrieved January 30, 2024, from the IPEDS Trend Generator (<u>https://nces.ed.gov/ipeds/TrendGenerator/</u>).

Between 2011-12 and 2021-22, trends in the numbers of certificates conferred in a CTE field varied by field of study. Four of 11 CTE fields of study saw increases of more than 50 percent in the number of certificates conferred between 2011-12 and 2021-22. Specifically,

- agriculture and natural resources increased 104 percent (from 5,800 to 11,800);
- computer and information sciences increased 99 percent (from 26,300 to 52,300);
- education increased 77 percent (from 8,400 to 14,900); and
- business and marketing increased 55 percent (from 68,100 to 105,500).

Meanwhile, 3 of 11 CTE fields of study saw a decrease in the number of certificates conferred between 2011-12 and 2021-22. Specifically,

- health sciences decreased 35 percent (from 417,700 to 270,300);
- consumer services decreased 3 percent (from 158,400 to 152,800); and
- public, legal, and social services decreased 3 percent (from 9,100 to 8,800).

Despite a 35 percent decrease in certificates conferred, health sciences was the most common field for CTE certificates in both 2011-12 and 2021-22.

Associate's Degrees

There were 499,200 associate's degrees conferred in CTE fields in 2021-22, which was 17 percent lower than in 2011-12 (602,700). In 2021-22, the following CTE fields of study made up more than 10 percent each of associate's degrees conferred in any CTE field:

- health sciences (36 percent of CTE associate's degrees)
- business and marketing (21 percent of CTE associate's degrees)

The remaining 9 of 11 CTE fields of study accounted for a combined 44 percent of CTE associate's degrees.

FIGURE 5.

Number of associate's degrees conferred by postsecondary institutions in career and technical education (CTE), by field of study: Academic years 2011–12 and 2021–22



NOTE: Data are for the 50 states and the District of Columbia. The fields shown are the 11 programs counted as occupational fields in postsecondary taxonomy categories (<u>https://nces.ed.gov/surveys/ctes/tables/postsec_tax.asp</u>). Data are for postsecondary institutions participating in Title IV federal financial aid programs. Figures are plotted based on unrounded data.

SOURCE: U.S. Department of Education, National Center for Education Statistics, Integrated Postsecondary Education Data System (IPEDS), Completions component, Fall 2011 (final data) and Fall 2021 (provisional data), retrieved January 30, 2024, from the IPEDS Trend Generator (<u>https://nces.ed.gov/ipeds/TrendGenerator/</u>).

Between 2011-12 and 2021-22, trends in the numbers of associate's degrees conferred in a CTE field varied by field of study. Four of 11 CTE fields of study saw decreases of more than 20 percent in the number of associate's degrees conferred between 2011-12 and 2021-22. Specifically,

- public, legal, and social services decreased 40 percent (from 22,500 to 13,500);
- protective services decreased 35 percent (from 51,300 to 33,400);
- engineering, architecture, and science technologies decreased 24 percent (from 43,800 to 33,300); and
- consumer services decreased 22 percent (from 33,000 to 25,700).

Meanwhile, 3 of 11 CTE fields of study saw an increase in the number of associate's degrees conferred between 2011-12 and 2021-22. Specifically,

- agriculture and natural resources increased 69 percent (from 7,100 to 12,000);
- communication and communications technologies increased 39 percent (from 8,500 to 11,800); and
- manufacturing, construction, repair, and transportation increased 11 percent (from 31,900 to 35,400).

Despite these increases, agriculture and natural resources and communication and communications technologies were the two least common CTE fields for associate's degrees conferred in both 2011-12 and 2021-22.

Postsecondary Pathways of Public High School CTE Concentrators

The preceding sections of this indicator provide information about CTE participation at the secondary and postsecondary subbaccalaureate levels. Data from HSLS:09 in this section provide more insight into the pathways from high school CTE participation to postsecondary education and outcomes about 8 years after public high school graduation. More specifically, these data provide insights into differences between high school CTE concentrators and nonconcentrators. In this indicator, CTE concentrators are defined as high school graduates who earned 2 or more credits in the same CTE area during high school; these CTE areas differ slightly from the fields reported in the sections above:

- agriculture and natural resources
- business, finance, and marketing
- communication and communications technologies
- computer and information sciences
- construction
- consumer services
- engineering, design, and production
- health care
- mechanical repair and operation
- public services

Nonconcentrators are defined as high school graduates who did not earn 2 or more credits in the same CTE area during high school. Among fall 2009 ninth-graders who graduated from public high schools by 2013 (hereafter referred to as "2013 public high school graduates"), 39 percent were CTE concentrators and 61 percent were nonconcentrators.¹⁷

While CTE programs are designed to help students enter the workforce without needing a bachelor's degree, the majority of high school CTE concentrators participate in postsecondary education, and many obtain bachelor's degrees. By June 2021 (about 8 years after high school graduation), 80 percent of 2013 public high school graduates who were CTE concentrators during high school had ever enrolled in postsecondary education. This was 4 percentage points lower than the percentage of nonconcentrators who had ever enrolled in postsecondary education (84 percent). On average, both CTE concentrators and nonconcentrators who enrolled in postsecondary education first did so less than 4 months after exiting high school.

Public High School CTE Concentrators and Postsecondary Certificate/Degree Attainment and Time to Degree

FIGURE 6.

Among 2013 public high school graduates ever enrolled in postsecondary education by June 2021, percentage distribution of highest postsecondary degree/certificate earned by June 2021, by high school career and technical education (CTE) concentrator status: 2021



¹ Includes bachelor's degree, master's degree, Ph.D., M.D., law degree (i.e., J.D.), and other higher level professional degrees. Under the Carl D. Perkins Career and Technical Education Act of 2006, as amended by the Strengthening Career and Technical Education for the 21st Century Act, bachelor's degrees are generally not considered to be career and technical education.

NOTE: Public high school graduates are defined as fall 2009 ninth-graders who graduated from a public high school with an honors or standard diploma by August 31 of their expected graduation year (2013). This figure includes only graduates who had a complete grade 9–12 transcript, defined as one that recorded at least 16 Carnegie units (a Carnegie unit is a credit hour, i.e., the equivalent of a course taken every school day, one period per day, for a full school year), with a positive, nonzero number of units completed in English. Ninety-four percent of 2013 public high school graduates had a complete grade 9–12 transcript. "Ever enrolled in postsecondary education" refers to ever enrolling in a postsecondary course or postsecondary certificate or degree program. CTE concentrators earned at least 2 credits in the same CTE area during high school, with the CTE areas being: agriculture and natural resources; business, finance, and marketing; communication and communications technologies; computer and information sciences; construction; consumer services; engineering, design, and production; health care; mechanical repair and operation; and public services. See https://nces.ed.gov/pubsearch/pubsinfo.asp?publid=2019046 for the taxonomy used to define high school subject areas. Figures are plotted based on unrounded data. Detail may not sum to totals because of rounding in the data labels.

SOURCE: U.S. Department of Education, National Center for Education Statistics, High School Longitudinal Study of 2009 (HSLS:09) High School Transcript Study, Second Follow-Up, Postsecondary Education Transcript and Student Financial Aid Records Collection, and Postsecondary Education Administrative Records Data Collection. See *Digest of Education Statistics 2023*, table 326.60.

Among 2013 public high school graduates ever enrolled in postsecondary education by June 2021, nearly a third had not received any postsecondary certificate or degree, including 32 percent of CTE concentrators and 31 percent of nonconcentrators. By June 2021, a higher percentage of CTE concentrators than nonconcentrators had received an associate's degree as their highest postsecondary degree (14 vs. 9 percent). Conversely, a lower percentage of CTE concentrators than nonconcentrators had received a bachelor's or higher degree as their highest postsecondary degree (48 vs. 54 percent) by June 2021.¹⁸ Among those who earned a certificate as their highest degree by June 2021, some 96 percent of CTE concentrators and 99 percent of nonconcentrators earned their certificate in a CTE field. Among those who earned an associate's degree as their highest degree of CTE concentrators (58 percent) than nonconcentrators (45 percent) earned their degree in a CTE field.

FIGURE 7.

Among 2013 public high school graduates ever enrolled in postsecondary education by June 2021, average number of months from first postsecondary enrollment to highest postsecondary degree/certificate earned by end of June 2021, by highest postsecondary degree/certificate and high school career and technical education (CTE) concentrator status: 2021



Highest postsecondary degree/certificate

Concentrators Nonconcentrators

‡ Reporting standards not met. Either there are too few cases for a reliable estimate or the coefficient of variation (CV) is 50 percent or greater.
¹ Includes bachelor's degree, master's degree, Ph.D., M.D., law degree (i.e., J.D.), and other higher level professional degrees. Under the Carl D. Perkins Career and Technical Education Act of 2006, as amended by the Strengthening Career and Technical Education for the 21st Century Act, bachelor's degrees are generally not considered to be career and technical education.

NOTE: Public high school graduates are defined as fall 2009 ninth-graders who graduated from a public high school with an honors or standard diploma by August 31 of their expected graduation year (2013). This figure includes only graduates who had a complete grade 9–12 transcript, defined as one that recorded at least 16 Carnegie units (a Carnegie unit is a credit hour, i.e., the equivalent of a course taken every school day, one period per day, for a full school year), with a positive, nonzero number of units completed in English. Ninenty-four percent of 2013 public high school graduates had a complete grade 9–12 transcript. "Ever enrolled in postsecondary education" refers to ever enrolling in a postsecondary course or postsecondary certificate or degree program. CTE concentrators earned at least 2 credits in the same CTE area during high school, with the CTE areas being: agriculture and natural resources; business, finance, and marketing; communication and communications technologies; computer and information sciences; construction; consumer services; engineering, design, and production; health care; mechanical repair and operation; and public services. See https://nces.ed.gov/pubsearch/pubsinfo.asp?publid=2019046 for the taxonomy used to define high school subject areas. Figures are plotted based on unrounded data.

SOURCE: U.S. Department of Education, National Center for Education Statistics, High School Longitudinal Study of 2009 (HSLS:09) High School Transcript Study, Second Follow-Up, Postsecondary Education Transcript and Student Financial Aid Records Collection, and Postsecondary Education Administrative Records Data Collection. See *Digest of Education Statistics 2023*, table 326.60.

Among 2013 public high school graduates who earned a certificate as their highest postsecondary degree by June 2021, CTE concentrators earned their certificate in fewer months, on average, than nonconcentrators (28 vs. 40 months). For those who earned an associate's degree or a bachelor's or higher degree, there were no measurable differences between CTE concentrators and nonconcentrators in the average number of months it took to earn their degree.

Among those whose highest postsecondary degree was an associate's degree, there was no measurable difference in time taken to earn the degree for high school CTE concentrators, regardless of whether their associate's degree was in a CTE or non-CTE field. However, among nonconcentrators, the time taken to earn an associate's degree was shorter, on average, for those whose degree was in a CTE field than for those whose degree was not in a CTE field (44 vs. 52 months).

Postsecondary Certificate/Degree Attainment by High School CTE Field of Concentration

Under the Carl D. Perkins Career and Technical Education Act of 2006, as amended by the Strengthening Career and Technical Education for the 21st Century Act (Perkins V), bachelor's and higher degrees are generally not considered to be career and technical education. However, some fields of study that are considered CTE at the subbaccalaureate level are also commonly offered at the bachelor's and higher degree levels. This section examines all postsecondary degree or certificate completion in fields related to graduates' high school CTE concentrations, regardless of the level of award.

Among 2013 public high school graduates ever enrolled in postsecondary education by June 2021, some 68 percent of CTE concentrators had earned any postsecondary degree or certificate, overall, by June 2021, which was not measurably different from the percentage of nonconcentrators who had earned any postsecondary degree or certificate. However, there were differences by specific fields of high school CTE concentration. Specifically, the percentages of concentrators in mechanical repair and operation (46 percent) and construction (52 percent) who earned any postsecondary degree or certificate by June 2021 were lower than for nonconcentrators as well as for concentrators in many other fields.

FIGURE 8.

Among 2013 public high school graduates who earned any postsecondary degree/certificate by June 2021, percentage distribution of high school career and technical education (CTE) concentrators who earned any postsecondary degree/certificate in the same field or a different field as their high school CTE concentration, by field of CTE concentration during high school: 2021



Field of CTE concentration during high school

See next page for notes and sources

† Not applicable.

Interpret data with caution. The coefficient of variation (CV) for this estimate is between 30 and 50 percent.

‡ Reporting standards not met. Either there are too few cases for a reliable estimate or the coefficient of variation (CV) is 50 percent or greater.

¹ Nonconcentrators are those who did not earn at least 2 credits in the same CTE area during high school, with the CTE areas being: agriculture and natural resources; business, finance, and marketing; communication and communications technologies; computer and information sciences; construction; consumer services; engineering, design, and production; health care; mechanical repair and operation; and public services. Since nonconcentrators did not concentrate in a CTE field during high school, "Postsecondary degree/certificate is in CTE field other than high school concentration" refers to a nonconcentrator having a postsecondary degree/certificate in any CTE field.

NOTE: Public high school graduates are defined as fall 2009 ninth-graders who graduated from a public high school with an honors or standard diploma by August 31 of their expected graduation year (2013). This figure includes only graduates who had a complete grade 9–12 transcript, defined as one that recorded at least 16 Carnegie units (a Carnegie unit is a credit hour, i.e., the equivalent of a course taken every school day, one period per day, for a full school year), with a positive, nonzero number of units completed in English. Ninety-four percent of 2013 public high school graduates had a complete grade 9–12 transcript. CTE concentrators earned at least 2 credits in the same CTE area during high school, with the CTE areas being agriculture and natural resources; business, finance, and marketing; communication and communications technologies; computer and information sciences; construction; consumer services; engineering, design, and production; health care; mechanical repair and operation; and public services. Students could concentrate in more than one CTE area if they earned 2 or more credits each in multiple subject areas. Those who cancentrated in more than one CTE area during high school were counted in each concentration. Among 2013 public high school graduates with complete transcripts who are known to have enrolled in postsecondary education by June 2021, some 15 percent of 2-credit concentrated in more than one CTE area during high school. See <u>https://nces.ed.gov/pubsearch/pubsinfo.asp?publid=2019046</u> for the taxonomy used to define high school subject areas. See <u>https://nces.ed.gov/pubsearch/pubsinfo.asp?publid=2019046</u> for the taxonomy used to define high school subject areas. See <u>https://nces.ed.gov/pubsearch/pubsinfo.asp?publid=2019046</u> for the taxonomy used to define high school subject areas. See <u>https://nces.ed.gov/pubsearch/pubsinfo.asp?publid=2019046</u> for the taxonomy used to define high school subject areas. See <u>https://nces.ed.gov/pubsearch/pubsinfo.asp?publid=2019046</u> for the taxo

SOURCE: U.S. Department of Education, National Center for Education Statistics, High School Longitudinal Study of 2009 (HSLS:09) High School Transcript Study, Postsecondary Education Transcript and Student Financial Aid Records Collection, and Postsecondary Education Administrative Records Data Collection. See *Digest* of Education Statistics 2023, table 326.65.

Among 2013 public high school graduates who earned any postsecondary degree or certificate by June 2021, a greater percentage of high school CTE concentrators (74 percent) than of nonconcentrators (64 percent) had earned their highest award in a CTE field. Twenty-seven percent of all CTE concentrators who earned a postsecondary award by June 2021 did so in the same field as their high school concentration. Compared with CTE concentrators who earned a postsecondary award, overall, higher percentages of those who concentrated in the following fields earned that award in the same field as their high school concentration:

- public services (54 percent)
- health care (44 percent)

Conversely, compared with CTE concentrators who earned a postsecondary award, overall, lower percentages of those who concentrated in the following fields earned that award in the same field as their high school concentration:

- computer and information sciences (15 percent)
- consumer services (13 percent)
- communication and communications technologies (10 percent)

Many 2013 public high school graduates who concentrated in a CTE field went on to earn a postsecondary award in a different CTE field or in a non-CTE-related field. Forty-seven percent of all CTE concentrators who earned a postsecondary award by June 2021 did so in a CTE-related field other than their field of high school concentration, and 26 percent did so in a non-CTE field. Compared with CTE concentrators, overall, there were generally no measurable differences in these percentages for specific fields of high school concentration. There were two exceptions:

- a lower percentage of public services concentrators earned an award in a different CTE field (25 vs. 47 percent)
- a lower percentage of agriculture and natural resources concentrators earned an award in a non-CTE field (14 vs. 26 percent)

Endnotes:

¹ National Center for Education Statistics. (n.d.). *About CTE Statistics*. Accessed February 6, 2024. <u>https://nces.ed.gov/surveys/ctes/about.asp</u>. ² CTE is sometimes referred to as "vocational/technical education."

³ For more information, see <u>https://cte.ed.gov/legislation/perkins-v</u>. ⁴ Carl D. Perkins Career and Technical Education Act. Accessed

March 27, 2024. <u>https://www.govinfo.gov/content/pkg/COMPS-3096/</u> pdf/COMPS-3096.pdf. ⁵ For general technical notes related to data analysis, data

interpretation, rounding, and other considerations, please refer to the <u>Reader's Guide</u>.

⁶ Please visit NCES's <u>Education Across America</u> website for the definition of locale.

⁷ Throughout this indicator, "award" refers to a postsecondary degree or certificate.

⁸ CTE concentrators are defined as those who earned at least 2 credits in the same CTE area during high school, with the CTE areas being: agriculture and natural resources; business, finance, and marketing; communication and communications technologies; computer and information sciences; construction; consumer services; engineering, design, and production; health care; mechanical repair and operation; and public services. Students could concentrate in more than one CTE area if they earned 2 or more credits each in multiple subject areas. Nonconcentrators are those who did not earn at least 2 credits in the same CTE area during high school. Both concentrators and nonconcentrators are limited to students who graduated from high school and had complete transcripts by 2013.

⁹ In this indicator, "2013 public high school graduates" are defined as fall 2009 ninth-graders who graduated from a public high school with an honors or standard diploma by August 31 of their expected graduation year (2013). This does not include GEDs or alternative credentials. ¹⁰ "Years of teaching experience" refers to the number of years the respondent had worked as a teacher, either full-time or part-time. ¹¹ In this section of the indicator, "all other" fields includes fields other than CTE, arts and music, English and language arts, foreign languages, health and physical education, mathematics and computer science, natural sciences, social sciences, and special education. ¹² Education specialist degrees or certificates are generally awarded for 1 year's work beyond the master's level. Includes certificates of advanced graduate studies.

¹³ For a high school graduate to be included in the analyses, their high school transcript had to meet 5 requirements: (1) the graduate

Reference tables: *Digest of Education Statistics 2023*, tables <u>326.60</u> and <u>326.65</u>; *Digest of Education Statistics 2022*, tables <u>209.50</u>, <u>210.50</u>, <u>210.60</u>, and <u>225.25</u>; <u>IPEDS Trend Generator; NAEP Data Explorer</u>

Related indicators and resources: <u>Career and Technical Education</u> <u>Programs in Rural High Schools; Career and Technical Education</u> (CTE) Statistics; Teacher Openings in Elementary and Secondary Schools; <u>Undergraduate Degree Fields</u> received either a standard or honors diploma, (2) the transcript had 3 or more years of delineated courses, (3) at least 1 course on the transcript was taken during the National Assessment of Educational Progress (NAEP) and High School Transcript Study (HSTS) assessment year, (4) the transcript contained 16 or more Carnegie credits, and (5) the transcript contained at least 1 Carnegie credit in English courses. The Carnegie unit is a standard of measurement that represents 1 credit for the completion of a 1-year course. ¹⁴ For information on how the 12 CTE subject areas are defined, see School Courses for the Exchange of Data (SCED).

¹⁵ Postsecondary CTE fields in this section of the indicator include agriculture and natural resources; business and marketing; communication and communications technologies; computer and information sciences; consumer services; education; engineering, architecture, and science technologies; health sciences; protective services; public, legal, and social services; and manufacturing, construction, repair, and transportation. See <u>https://nces.ed.gov/ surveys/ctes/tables/postsec tax.asp</u> for the taxonomy used to define postsecondary CTE categories.

¹⁶ Certificates include awards of less than 1 academic year, awards of at least 1 but less than 2 academic years, and awards of at least 2 but less than 4 academic years (that are not associate's degrees).
¹⁷ This section of the indicator reports on 2013 public high school graduates, defined as fall 2009 ninth-graders who graduated from a public high school with an honors or standard diploma by August 31 of their expected graduation year (2013). The data are for graduates who had a complete grade 9-12 transcript, defined as one that recorded at least 16 Carnegie units (a Carnegie unit is a credit hour, i.e., the equivalent of a course taken every school day, one period per day, for a full school year), with a positive, nonzero number of units completed in English. Ninety-four percent of 2013 public high school graduates had a complete grade 9-12 transcript. GED or alternative diploma earners are not included.

¹⁸ Bachelor's degree or higher includes bachelor's degrees, master's degrees, Ph.D.s, M.D.s, law degrees (i.e., J.D.s), and other higher level professional degrees. Under the Carl D. Perkins Career and Technical Education Act of 2006, as amended by the Strengthening Career and Technical Education for the 21st Century Act, bachelor's degrees are generally not considered to be career and technical education.

Glossary: Associate's degree; Bachelor's degree; Certificate; Classification of Instructional Programs (CIP); Control of institutions; English learner (EL); Enrollment; Locale codes; Postsecondary education; Racial/ethnic group; Secondary/high school