



EAB

High School Indicators of Postsecondary Success

Evaluating Career Clusters, Workplace Learning Experiences, and Credentials

District Leadership Forum

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1) Executive Summary

Key Observations

Career Clusters (pages 5-12)

To ensure students who take courses in a career cluster succeed in the labor market or in postsecondary education, encourage students to concentrate in one cluster and take at least three credits. Students who concentrate (i.e., take three or more credits in one career cluster) increase the odds they will enter the labor market after high school. If career cluster concentrators do choose to attend a postsecondary educational institution, they are more likely to major in their career cluster concentration. By offering career clusters, administrators allow students to test potential majors and careers in high school, where the cost of changing one's mind is relatively low. Additionally, career cluster concentrators who enter the labor market after high school instead of pursuing postsecondary education earn, on average, 34 cents more an hour than all non-college-bound high school graduates.

Workplace Learning Experiences (pages 13-16)

Encourage students to work a moderate number of hours in high quality workplace learning experiences to improve students' non-academic skills. Students who work up to 20 hours in workplace learning experiences that are relevant to their academic coursework experience slight increases in high school academic performance. While these students only slightly increase their high school GPAs, they also achieve non-academic benefits when working moderate hours, including improved time management skills, increased resilience, and increased access to potential jobs through professional networks. Administrators should direct students towards quality workplace learning experiences (i.e., experiences in which supervisors support students and students can take control of their own work) to maximize the academic and non-academic benefits of workplace learning experiences.

Credentials (pages 17-23)

Urge students who do not plan on attending a four-year postsecondary institution to earn a credential, specifically a long-term certificate, to increase students' earning potential after graduating high school. Students who earn a credential in high school increase the probability they graduate on time and the probability that they enroll in a community college. That said, students who earn a credential decrease their probability of earning a bachelor's degree, as their credential may qualify them to perform jobs without pursuing additional schooling. To maximize potential earnings for students who wish to enter the labor market directly from high school, administrators should guide students to earn long-term certificates or certifications. Workers (i.e., employed 24-year-olds) in Florida with certifications earn 12 percent more in wages than workers without a certification or with other forms of credentials (e.g., licenses, software credentials). Within the certificate category, long-term certificates (i.e., certificates that require one or more years of full-time study to complete) elicit higher wages than short-term certificates. Women in particular benefit from earning a long-term certificate—they experience a 14.4 percent return on wages.

2) Career Clusters

Summary

Encourage Students to Concentrate in a Career Cluster

Students who concentrate (i.e., take more than three classes) related to a specific career cluster increase the probability that they will work for pay if they enter the labor market directly after high school. Also, non-college-bound career cluster concentrators make 34 cents an hour more than do non-college bound high school students overall.

College-bound students also benefit from concentrating in a career cluster. If students concentrate in a career cluster, they increase the probability they will major in their career cluster field in college (i.e., career clusters help students find the right major for them). Students who know their desired field of study increase the probability that they graduate on time, which saves them both time and potential tuition.

Administrators should provide career development support and direct students toward complimentary workplace learning experiences to maximize the potential benefits of career clusters. Additionally, administrators should offer courses within career clusters in a variety of fields to ensure that students can enter the career path of their choice after high school graduation.

Career and Technical Education Career Clusters¹

-  Agriculture, Food and Natural Resources
-  Architecture and Construction
-  Arts, Audio/Video Tech. and Communication
-  Business Management & Administration
-  Education and Training
-  Finance
-  Government and Public Administration
-  Health and Science
-  Hospitality and Tourism
-  Human Services
-  Information Technology
-  Law, Public Safety, Corrections and Security
-  Manufacturing
-  Marketing
-  STEM
-  Transportation, Distribution, and Logistics

Postsecondary Placement

Provide Multiple Career Clusters for Students with Different Postsecondary Goals

Career clusters refer to sixteen distinct subjects covered by career and technical education designed to help students learn about multiple related job opportunities and skills within the same field (**see categories on the right**). Typically, students can specialize in a given career cluster by taking coursework related to a specific pathway within that career cluster.² For example, a student can pursue courses in one of agriculture, food, and natural resources' seven distinct pathways: food products and processing systems; power, structural, and technical systems; plant systems; natural resources systems; environmental service systems;

1) Cassandra Dortch, "Career and Technical Education (CTE): A Primer," CRS Report for Congress (Washington, DC: Congressional Research Service, 2014), <https://fas.org/sgp/crs/misc/R42748.pdf>.

2) Dortch.

and agribusiness systems.³ Often, studies will collapse career clusters into larger groups. For example, authors might collapse the two clusters of business management & administration and finance into one cluster: business.

While students often participate in workplace learning experiences and/or earn a credential when taking courses within a cluster, students can enroll in a CTE/career cluster course without pursuing other opportunities. Typically, studies evaluating the postsecondary impact of career clusters independently of associated workplace learning experiences and credentials compare students who took three or more credits (i.e., classes) in a single cluster—*CTE/career cluster concentrators*—with students who took three or more credits of CTE courses across multiple clusters—*CTE/career cluster non-concentrators*.

Though students who concentrate in a career cluster forgo attending postsecondary education more often than their non-concentrator counterparts, these students still achieve positive postsecondary outcomes.⁴ The graph below (**page seven**) presents the distribution of all public high school students' postsecondary placements in 2006, segmented by career cluster. Eighty percent of career cluster non-concentrators enrolled in some form of postsecondary education, while only 70 percent of career cluster concentrators enrolled in postsecondary education. That said, twenty-nine percent of career concentrators gained paid employment and only one percent neither enrolled in a postsecondary educational institution nor worked for pay. Career cluster concentrators may choose to take advantage of the skills they learned in career cluster courses to seek employment directly rather than attend postsecondary education.



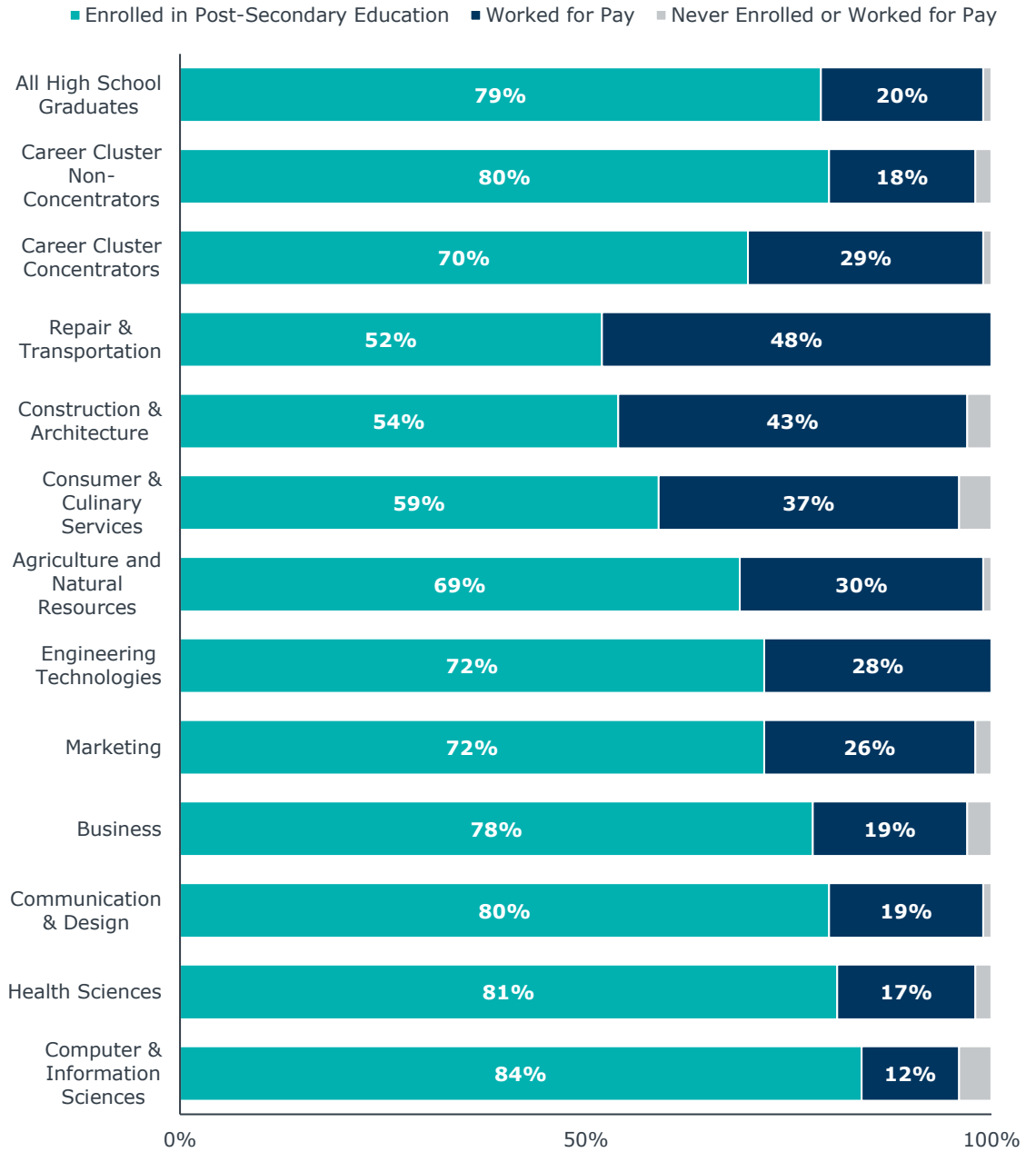
Within distinct types of career clusters, postsecondary destinations for career cluster concentrators varied drastically. For example, 48 percent of students who concentrated in repair and transportation worked for pay after high school and 52 percent enrolled in some form of postsecondary education. Conversely, 78 percent of students who concentrated in business enrolled in some form of postsecondary education and only 19 percent worked for pay after high school. The remaining three percent neither enrolled in some form of postsecondary education nor worked for pay.

Since postsecondary trajectories vary so much across distinct career clusters, administrators can encourage both students interested in postsecondary education and students who wish to enter the labor market to concentrate in a career cluster of interest to them. In other words, administrators do not need to discourage students who wish to enter postsecondary education from concentrating in a career cluster. Administrators should ensure that schools offer courses relevant to multiple career clusters, including clusters that support students who wish to enter the workforce (e.g., repair and transportation) and clusters that support students who wish to continue to postsecondary education (e.g., business).

3) Dortch, 3.

4) "National Assessment of Career and Technical Education" (U.S. Department of Education, September 2014), <https://www2.ed.gov/rschstat/eval/sectech/nacte/career-technical-education/final-report.pdf>.

Distribution of Public High School Student Postsecondary Outcomes within Career Clusters: 2006⁵



5) "National Assessment of Career and Technical Education."

Career Clusters Alone Do Not Appear to Impact Secondary Academic Achievement

The 2014 National Assessment of Career and Technical Education by the U.S. Department of Education, in an assessment of three quasi-experimental studies, found taking a CTE/career cluster course does not impact secondary academic achievement. While the report observes career cluster concentrators academically outperform non-concentrators, student characteristics (e.g., race, gender, income) explain these differences.⁶

On their own, participating in a career cluster may not improve secondary academic outcomes for students, but a different study conducted in 2016 found that if students both enrolled in a small learning community and took CTE/career cluster courses, their chances of graduating increased 11.3 percent. Researchers conducting this study also observed that the more CTE credits a student took, the more likely that student was to graduate.⁸

Career academies often incorporate both CTE courses and small learning communities. For more on how to effectively establish career academies see the EAB report [Establishing Career Academies](#).

4%

Increase in the probability a student **in a small learning community** graduates from high school for each additional CTE credit earned.⁷

Students in the above study selected career-themed communities based on their interests. Advisors helped each student visualize their futures, set goals, and connect what the student learned in the classroom to the world outside school. The students in this study could earn further college credit through CTE courses and each student could participate in internships alongside resume workshops and mock interviews.⁹ These findings suggest that administrators should provide additional career development support and direct students toward workplace learning experiences that complement their chosen career cluster to maximize the potential secondary academic benefits of career clusters.

Encourage College-Bound Students to Concentrate in Career Clusters of Their Desired College Major

A 2017 study by Plasman et al. investigates the relationship between taking CTE/career cluster courses and earning some form of postsecondary education credential (e.g., a bachelor's degree). The authors found that each additional credit a student earned in a career cluster increased the probability a student would major in that cluster when attending postsecondary education. Students who took courses in agriculture, applied STEM, business, communications, health, and trade career clusters were most likely to continue into similar majors at a postsecondary institution.¹⁰ Though some of these students may have already possessed an interest in their chosen field prior to taking CTE courses in a career cluster, other students may have used career cluster CTE coursework to identify and further develop their career interest.

6) "National Assessment of Career and Technical Education."

7) Marisa Castellano et al., "Preparing Students for College and Career in the United States: The Effects of Career-Themed Programs of Study on High School Performance," *Vocations and Learning*, July 13, 2016, <https://doi.org/10.1007/s12186-016-9162-7>.

8) Castellano et al.

9) Castellano et al.

10) Jay S. Plasman, Michael Gottfried, and Cameron Sublett, "Are There Academic CTE Cluster Pipelines? Linking High School CTE Coursework and Postsecondary Credentials," *Career and Technical Education Research* 42, no. 3 (December 2017): 219–42, <https://doi.org/10.5328/cter42.3.219>.

Students who identify a best-fit major early on (through career cluster CTE courses or other means) demonstrate positive postsecondary outcomes. EAB's report [Promoting Timely Degree Completion \(pages 35-43\)](#) highlights the negative consequences of choosing a poor-fit major in college. The study finds that students who choose a poor-fit major take longer to graduate and notes that students who find majors that fit their interests perform better academically than undecided students.

On a similar note, Plasman et al.'s study found that students in the agriculture, applied STEM, business, communications, health, and trade career clusters (students who were most likely to continue into similar majors in college) were also more likely to earn associate's degrees and bachelor's degrees in those areas compared to other career clusters. Though additional factors beyond best-fit major selection likely influenced improved postsecondary outcomes for these students, the fact that these students identified a best-fit major early may also have contributed to improved performance.¹¹

While students who took more courses in a single career cluster increased the probability they would major in that cluster, they did not decrease their probability of majoring in another field in college (e.g., students may have double majored in both their career cluster field and another field of interest). In other words, students can deepen their interest in a field of study through career cluster courses without losing interest in other subjects.¹²

These findings reinforce the earlier suggestion that administrators should offer a variety of CTE coursework in multiple career clusters to accommodate both students who wish to pursue postsecondary education and those students who wish to enter the labor market. More specifically, administrators can encourage postsecondary-bound students to test out their desired major in high school through career-cluster associated CTE courses so that students can determine if they enjoy that field of study before enrolling in expensive university courses.



Ask Students Who Do Not Wish to Take CTE Courses to Complete Career Interest Assessments

Page 41 of [Promoting Timely Degree Completion](#) describes how Florida International University asks all applicants to take Kuder's 10-minute career interest assessment, which generates a set of best-fit career clusters based on student responses. Students at Florida International University who choose a major associated with a best-fit career cluster perform better academically than students who do not. In addition, 60 percent of students who choose a best-fit major do not change their major. Administrators can help students identify best-fit career clusters without mandating course sequences.

Labor Market Outcomes

Encourage Labor-Market-Bound Students to Concentrate in a Career Cluster and Take Three or More Credits

Analysis from the Department of Education in 2011 observes that students who concentrate in a career cluster are more likely to work for pay than students who do

11) Plasman, Gottfried, and Sublett.
12) Plasman, Gottfried, and Sublett.

not concentrate in a career cluster two years after graduating high school.¹³ The below chart (**page 11**) shows the distribution of students' postsecondary placement by concentrator/non-concentrator status and the overall number of CTE credits a student takes. Typically, researchers consider students who take three or more credits/courses in one career cluster as career cluster concentrators. Here, researchers further disaggregated between students with two credits in the same career cluster and students with three credits in the same career cluster.

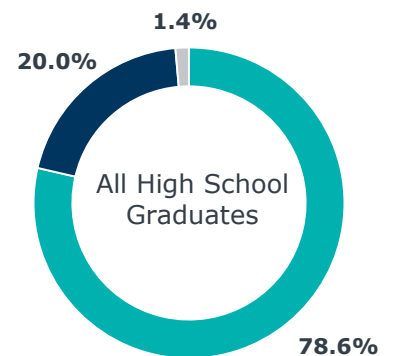
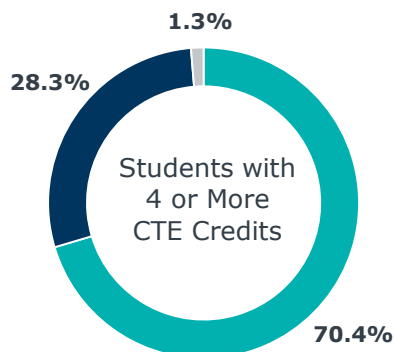
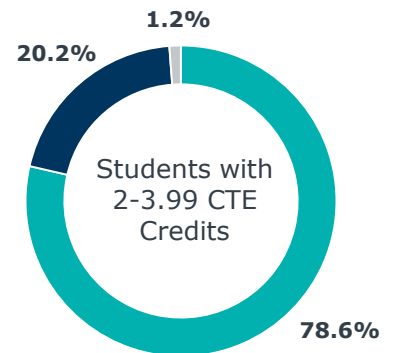
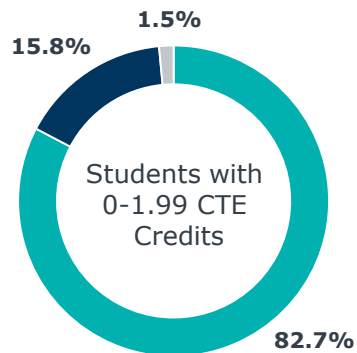
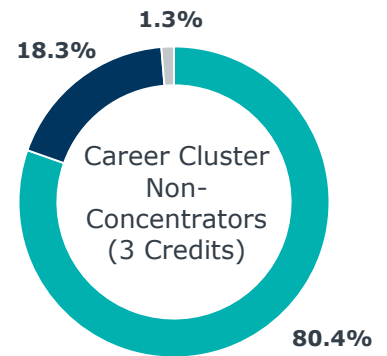
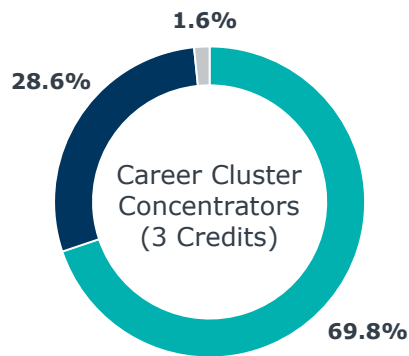
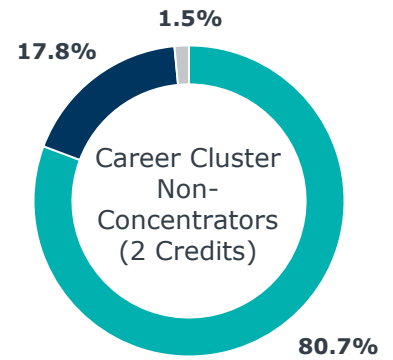
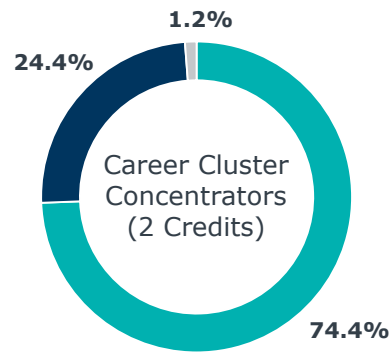
About 24 percent of concentrators with two credits work for pay two years after graduating high school, while about 29 percent of concentrators with three credits work for pay after graduating high school. While these simple distributions do not necessarily infer a causal relationship, they do indicate that an additional credit within a concentration corresponds with an increased probability a student will earn employment after graduating high school.

The below chart also shows that each additional CTE credit a student earns, whether in the same or a different career cluster, will increase her likelihood of working for pay after high school instead of enrolling in postsecondary education. Earning three or more CTE credits does not necessarily mean a student concentrated within one specific career cluster. Rather, it signifies she took two credits from any career cluster.

13) Vera Bersudskaya and Xianglei Chen, "Postsecondary and Labor Force Transitions Among Public High School Career and Technical Education Participants," Issue Tables (U.S. Department of Education, January 2011), <https://nces.ed.gov/pubs2011/2011234.pdf>.

Distribution of Postsecondary Placement for High School Students: 2004-2006¹⁴

■ Enrolled in Post-Secondary Education ■ Worked for Pay ■ Never Enrolled or Worked for Pay

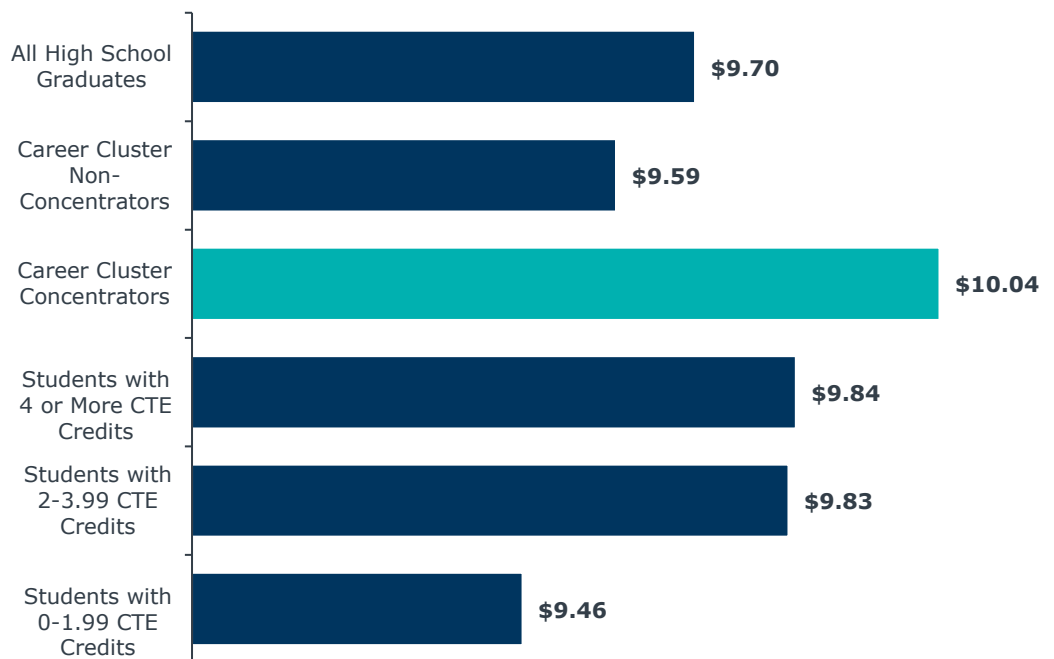


While students who take three or more CTE classes increase the probability they will work for pay after graduating high school, the below graph (**page 12**) suggests only career cluster concentrators experience a major difference in hourly wages compared to the rest of the high school graduate working population. The entire public high school graduate population—which includes career cluster concentrators—makes \$9.70 an hour on average two years after high school. Career cluster concentrators make \$10.04 an hour on average.¹⁵ So, while students can increase their likelihood of working for pay after high school without concentrating (**see above chart on page 11**), it appears concentrating in a career cluster is more advantageous for students who wish to enter the labor market after graduating high school.

When administrators advise students who know they wish to enter the labor market after high school, they should recommend those students concentrate in a career cluster of interest to both help increase the likelihood those students will find employment and increase the likelihood those students will earn higher wages.

Other research on wages of career cluster concentrators suggests certain cluster concentrations yield high wages than others. For example, a 2014 study by Jacobson and Mokher found that architecture and construction concentrators earn the highest wages after graduating high school.¹⁷ Administrators may consider prioritizing architecture and construction career clusters over other career clusters.

Average Hourly Wages Two Years After Graduating High School for Students Who Did Not Enroll in Postsecondary Education: 2006¹⁶



Provide Additional Supports to Elicit Maximum Benefits from Career Clusters

A 2008 study found that career cluster concentrators in career academies earned 11 percent more than non-concentrators.¹⁸ While career academies require substantial curriculum and instructional supports beyond CTE courses, the findings suggest administrators should provide supports such as workplace learning experiences or the opportunity to earn a credential alongside career cluster courses to elicit the best possible labor market outcomes for high school graduates who will not attend a postsecondary institution.

14) Bersudskaya and Chen.

15) "National Assessment of Career and Technical Education."

16) "National Assessment of Career and Technical Education" Exhibit 6.7 (U.S. Department of Education, September 2014), <https://www2.ed.gov/rschstat/eval/sectech/nacte/career-technical-education/final-report.pdf>.

17) Louis S. Jacobson and Christine Mokher, "Florida Study of Career and Technical Education. Final Report." (Arlington, VA: CNA Corporation, 2014), <https://pdfs.semanticscholar.org/b7dc/597ecd6f2eddc66cd14a07a8c1b56268bdb.pdf>.

18) James J. Kemple and Cynthia J. Wilner, "Career Academies: Long-Term Impacts on Work, Education, and Transitions to Adulthood" (New York: MDRC, July 6, 2012), <https://www.mdrc.org/publication/career-academies-long-term-impacts-work-education-and-transitions-adulthood>.

3) Workplace Learning Experiences

Summary

Encourage Students to Work a Moderate Number of Hours to Develop Important, Non-Academic Skills

Students who work up to 20 hours in workplace learning experiences that are relevant to their academic coursework slightly increase their secondary academic performance, a necessary qualification for college-bound and labor-market-bound high school graduates. Student who work a moderate number of hours also gain non-academic benefits (e.g., increased resilience, access to a professional network) early in their career.

Administrators may wish to advertise these benefits to students and parents to encourage students to work during high school. To maximize student benefits from workplace learning experiences, administrators should ensure students participate in quality workplace learning experiences that connect work to their academic coursework.

Outcomes

Limit Student Work Hours to Mitigate Potential Negative Impacts on Academic Performance

A workplace experience is any type of work that allows students to gain training and job experience in general (e.g., part-time jobs, internships). Research on the impact of workplace learning experiences suggests that working a moderate number of hours improves student secondary academic outcomes (i.e., GPA), but excessive hours of work impede student secondary academic performance. In their 1995 book, Stern et al. find working between zero and 20 hours increases student academic performance (i.e., mean GPA). For students who work more than 13-20 hours per week, Stern et al. find a negative relationship between work hours and school academic performance.¹⁹ Given that improved secondary academic success contributes to student success after high school, administrators should encourage students to work only moderate hours to improve students' probability of postsecondary success.

In co-op jobs, students work part of the week in jobs related to their academic coursework. The teacher will visit students at work at least once a semester. The student's supervisor helps determine the students' grade at the end of the semester.

While the authors of the above book analyze all types of work collectively in their analysis, further research by Stern et al. in 1997 suggests different types of work elicit different impacts on secondary school academic success. Students in co-op jobs (i.e., workplace learning experiences related to and integrated with classroom instruction) academically benefit from moderate amounts of work (up to 20 hours), while students in non-school-supervised work experiences (NSWEs) experience a steady decline in academic performance for each additional hour they work.²⁰

The scatter plot below (**page 14**) plots the number of work hours against high school GPA presented in quartiles. While both types of work are negatively associated with academic performance beyond the 20-hour mark, each additional hour of NSWE work corresponds with a greater decrease in academic performance than does each additional hour of co-op work. Students in co-op jobs reported more connections

19) David Stern et al., *School to Work: Research on Programs in the United States*, The Stanford Series on Education and Public Policy (Routledge, 1995).

20) David Stern et al., "What Difference Does It Make If School and Work Are Connected? Evidence on Co-Operative Education in the United States," *Economics of Education Review* 16, no. 3 (1997): 219, <https://EconPapers.repec.org/RePEc:eee:ecoedu:v:16:y:1997:i:3:p:213-229>.

between their academic course work and their job, which may contribute to the smaller negative marginal effect of working a co-op job on academic performance.²¹

High School Mean GPA by Quartiles of Work Hours²²



The study's authors divide the observed data into four distinct sections (i.e., quartiles) based on the number of hours students work, with the median hours worked separating the upper two quartiles and the lower two quartiles. The authors then find the mean GPA for students within each quartile for both NSWE and co-op jobs.

The authors posit that students less interested in school and more interested in work are more likely to enroll in co-op job opportunities, which may explain the lower average GPAs among students with co-op jobs. The authors also posit that students less interested in school are more likely to work longer hours at NSWE jobs, which may in part explain the larger drop in GPA after each additional hour a student works for NSWE jobs.²⁴



Co-Op Students Earn More Wages Than Other Students Three Years After Graduation

In the same 1997 study, Stern et al. observe students who participated in a co-op job earned significantly higher wages than students who did not participate in a co-op job.²⁵ The authors attribute these results primarily to two factors:

1. Co-op students are less likely to enroll in postsecondary education.
2. Peers of co-op students who attend college often earn low wages while in college.

21) Stern et al., 219.

22) Stern et al., "What Difference Does It Make If School and Work Are Connected? Evidence on Co-Operative Education in the United States."

23) Stern et al., *School to Work: Research on Programs in the United States*.

24) Stern et al., "What Difference Does It Make If School and Work Are Connected? Evidence on Co-Operative Education in the United States,"

219.

25) Stern et al., "What Difference Does It Make If School and Work Are Connected? Evidence on Co-Operative Education in the United States."

Workplace Learning Experiences Help Students Develop Non-Academic, Work, and Life Skills

While working a moderate number of hours in high school may only increase student secondary academic performance if students complete specific types of work (e.g., co-op workplace learning experiences), numerous studies identify non-academic benefits associated with working a moderate number of hours in high school.²⁶ For example, a 2010 study by Mortimer finds students who work steadily in high school can develop quality time management skills,²⁷ which benefit students regardless of whether they attend college or enter the workforce. Mortimer and other researchers also highlight additional non-academic benefits of workplace learning experiences

Non-Academic Benefits for Students Working Moderate Hours in High School



Better Time Management

Students can develop time management skills by **balancing academics, work, and other social priorities**.²⁸



Career Prospects

Gaining consistent and steady work right after high school provides students with income security and helps them gain experience, which opens **future career prospects** for students.²⁹



Increased Resilience

Stress from work decreases self-esteem and self-efficacy in the short-term. That said, students exposed to work stressors during high school experience **fewer mental health challenges** in response to stress later in life.³⁰

Professional Networks

Work during high school allows students to build a professional network before graduating college, which helps **students find work opportunities** later in life. Students without family professional connections benefit even more from developing a professional network earlier.³¹

While all students benefit from improved time management skills and increased resilience, students entering the labor force primarily benefit from developing career prospects and professional networks. Schools that offer students the opportunity to participate in workplace learning experiences may wish to advertise these benefits to both students and parents to encourage students to work during high school.

26) Kate Graham and Jennifer Morrow, "Required High School Internships.," *Techniques* 88, no. 3 (2013): 52–55, <https://eric.ed.gov/?id=EJ1016383>; Jeylan T. Mortimer, "The Benefits and Risks of Adolescent Employment," *The Prevention Researcher* 17, no. 2 (2010): 8, <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC2936460/pdf/nihms220511.pdf>; Jeylan T. Mortimer and Jeremy Staff, "Early Work as a Source of Developmental Discontinuity During the Transition to Adulthood," *Development and Psychopathology* 16, no. 4 (2004): 1047–70, <https://www.cambridge.org/core/article/early-work-as-a-source-of-developmental-discontinuity-during-the-transition-to-adulthood/5D7047754B5F3FF673109D4E296CF01C>.

27) Mortimer, "The Benefits and Risks of Adolescent Employment."

28) Mortimer.

29) Mortimer.

30) Mortimer and Staff, "Early Work as a Source of Developmental Discontinuity During the Transition to Adulthood."

31) Graham and Morrow, "Required High School Internships."

Direct Students Towards High-Quality Workplace Learning Experiences

Administrators who desire to elicit the maximum benefits of workplace learning experiences for their students should direct students to quality workplace learning experiences. One potential signal of a high-quality work experiences is appropriate pay. A 1991 panel data study (i.e., a study that tracks the same students over a period of time) in the *American Sociological Review* found that well-paying jobs develop students' ability to solve problems or accomplish goals.³²

Other researchers identify more general indicators of workplace learning experience quality for unpaid experiences (e.g., unpaid internships).³³ The below graphic (**page 16**) outlines four indicators of quality workplace learning experiences for administrators to consider when recommending workplace learning experiences to students. Each indicator is a statistically significant predictor of student career exploration. In other words, if a workplace learning experience incorporates one of the below characteristics, students are more likely to report that a workplace learning experience assisted them in achieving their career goals.

Indicators of Quality Unpaid Work Experiences³⁴

- 1 Autonomy**
Students can use their initiative during their workplace learning experience (i.e., student can take control of their own work).
- 2 Peer Feedback**
Students' work colleagues help them improve their work whenever possible.
- 3 Social and Supervisor Support**
 - Students work in friendly environment with welcoming coworkers.
 - Students' supervisors take an interest in their opinions and ideas.
- 4 Varied Learning Opportunities**
Students perform a variety of tasks at work.

Gamboa et al. tested the accuracy of these quality indicators with a longitudinal study of Portuguese high school students, ages 16-26, enrolled in 16 vocational education high schools. Because Portugal allows young adults to take vocational education training courses, approximately 19 percent of participants were older than 18.

32)Michael D. Finch et al., "Work Experience and Control Orientation in Adolescence," *American Sociological Review* 56, no. 5 (1991): 597-611, www.jstor.org/stable/2096082.

33)Vitor Gamboa, Maria Paula Paixão, and Saúl Neves de Jesus, "Internship Quality Predicts Career Exploration of High School Students," *Journal of Vocational Behavior* 83, no. 1 (August 1, 2013): 78-87, <http://www.sciencedirect.com/science/article/pii/S0001879113000651>.

34)Gamboa, Paixão, and Neves de Jesus, 9.

4) Credentials

Summary

Encourage Labor-Market-Bound Students to Earn Long-Term Certifications

Students who earn a credential in high school increase the probability that they graduate high school on time and the probability they will enroll in a community college. That said, students who earn a credential in high school decrease their probability of earning a bachelor's degree—these students may choose to enter the workforce based on their credential alone, rather than pursue additional education. Long-term certifications yield the highest returns out of all credential types for high school graduates who do not pursue a bachelor's degree.

Administrators concerned with student postsecondary success should encourage students who do not plan to pursue postsecondary education or whose performance and grades may prevent them from graduating to earn a long-term certificate. Administrators can help students with credentials plan for postsecondary avenues after earning their credential.

For students who earn a credential and still wish to pursue postsecondary education, administrators should help students avoid pursuing academic options unsuited to their future career plans. Additionally, schools should provide students who earn credentials—regardless of their postsecondary plans—with rigorous academic training. This way, students who wish to attend more selective postsecondary academic institutions meet both the entry requirements and the academic expectations of those institutions.

Academic Outcomes

Earning a Credential Improves the Probability that Students Graduate High School and Enroll in Community College

Credentials refer to an authorized, third-party recognition of a student's qualifications or competences in a specific skill or knowledge base.³⁵ The chart below (**page 18**) presents the four types of credentials. Specific industries or professional associations often recognize credentials they consider to be high quality to help both employers and workers prioritize the correct credentials. These industry-recognized credentials are often referred to as industry credentials.³⁶

35) "What Is a Credential?" (Association for Career and Technical Education, 2018), https://www.acteonline.org/wp-content/uploads/2018/02/What_is_a_Credential_71417.pdf.

36) "What Is a Credential?"

Types of Credentials³⁷

Though these definitions from the Association for Career and Technical Education accurately portray the differences between the various types of credentials, researchers do not always precisely define the category to which the credential they study belongs.

	Certificate/ Educational Certificate	Certification	License	Degree
Awarding Institution	Educational Institution	Business, Trade Association, Industry	Government Agency	Educational Institution
How to Earn	Complete Course of Study	Complete Course of Study and Take Assessment	Complete Course of Study and/or Take Assessment; Meet Specific Governmental Requirements	Complete Course of Study
What it Signifies	Education; Knowledge Base	Skill Mastery	Legal Permission to Work in a Specific Field	Education; Knowledge Base
Completion Time	Less than Two Years	Variable	Variable	Two or More Years
Required Maintenance	N/A	Skill Practice and Re-Assessment	Re-Application and Continuing Education	N/A
Example	Certificate in Business Administration	Certified Welder	Cosmetologist	Bachelor of Science

A 2019 study by ExcelinED and Burning Glass Technologies analyzed the impact of earning a credential—the study analyzes certifications, licenses, and software credentials (e.g., earning a Microsoft Office certification like MOS Expert)—during high school on student education and labor market outcomes. After examining student data from Florida, Indiana, and Kentucky, researchers found that students in a CTE program who earned a credential were more likely to both graduate high school and graduate on time than students who did not earn a credential across all states. Researchers also noticed this effect was stronger for female students than for male students, comparatively.³⁸

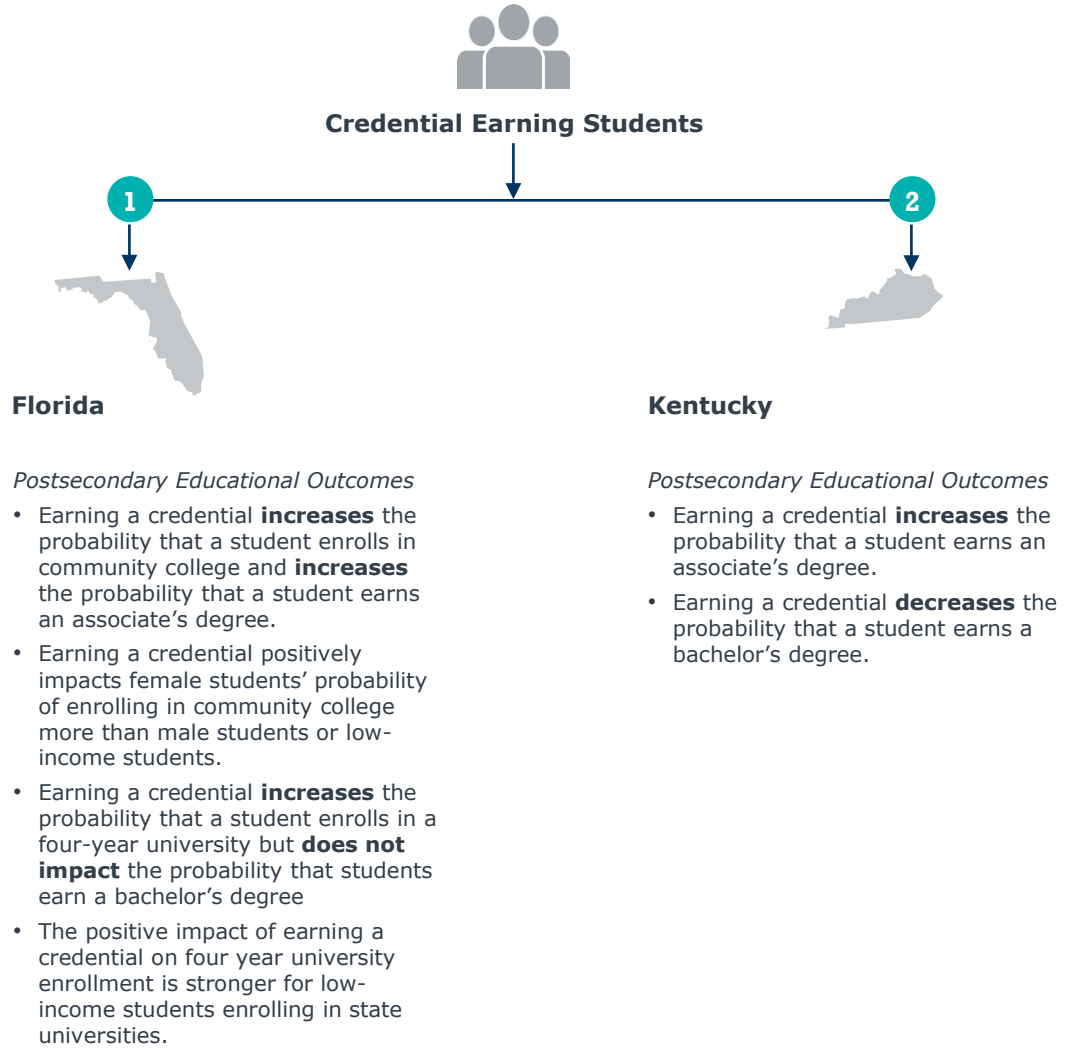
These unified results across each state do not extend to postsecondary educational enrollment and graduation. The chart below (**page 19**) profiles findings related to postsecondary outcomes for CTE students who earned a credential in high school in Florida, and Kentucky. Researchers could not access data on student postsecondary outcomes in Indiana.

³⁷ "What Is a Credential?"

³⁸ Matthew Walsh et al., "Where Credentials Meet the Market: State Case Studies on the Effect of High School Industry Credentials on Educational and Labor Market Outcomes" (ExcelinED / Burning Glass Technologies, June 2019), https://www.burning-glass.com/wp-content/uploads/credentials_meet_market_report.pdf.

Postsecondary Educational Outcomes for CTE Credential Earning Students in Florida and Kentucky³⁹

CTE students who earn a credential will qualify as career cluster concentrators as well. Thus, the independent impact of career cluster concentrator status influences these results.



The authors provide two theoretical justifications to explain the negative and null relationship between earning a credential in high school and earning a bachelor's degree. First, while the authors controlled for GPA in their regression analysis, the authors did not control for curriculum rigor. In other words, a student who earned a 3.85/4.0 at one school district might have earned a 3.55/4.0 in another district, with curriculum rigor as the only differing factor. Credential earners may have earned a GPA strong enough to graduate high school and enroll at a university but lack the academic skills necessary to graduate.⁴⁰

Additionally, since the loss of income from potential work for students with credentials increases each year that they attend postsecondary education, the authors suggest that students with credentials may wish to enter the workforce rather than continue with postsecondary education.⁴¹

School districts that offer credential attainment should help students with credentials plan for postsecondary avenues after earning a credential. Specifically, administrators should help students with credentials avoid pursuing academic options unsuited to their future career plans (i.e., degrees that do not align with the skills associated with

39) Walsh et al.
 40) Walsh et al., 50.
 41) Walsh et al., 50.

their chosen field). Additionally, schools should provide students who earn credentials with rigorous academic training so students who wish to pursue more selective postsecondary academic institutions meet both the entry requirements and the academic expectations of universities.

Labor Market Outcomes

Credentials Boost Earning Potential for Non-Bachelor's Degree Holders

The government awarded 71 percent of professional certificates in 2012. This suggests that most of the professional certificates awarded in 2012 were licenses. Thus, the authors only analyze licenses in this earnings comparison. The authors do not provide a clear definition of what constitutes an educational certificate.⁴⁴

Students with credentials who enter the job market instead of enrolling in postsecondary education earn more than students without a credential.⁴² In 2012, Ewert and Kominski analyzed U.S. Census Bureau median monthly earnings data for credential earners. They disaggregate their analysis by education level (i.e., less than high school, high school graduate, some college, etc.) and find that earning a license or educational certificate elicits statistically significantly higher earnings for people with some high school education, high school graduates, and people with some college education but not a degree. For example, high school graduates with a license earn a median monthly income of \$3,053, while high school graduates without a license earn a median monthly income of only \$2,500. People who graduated high school and earned both a license and educational certificate earned \$147 (in median monthly earnings) more than people with only a license and \$700 (in median monthly earnings) more than those with neither type of credential.⁴³ The graph below (**page 21**) shows the median monthly earnings for all education levels up to bachelor's degree holders.

Credentials also benefit students who do not graduate high school. High school drop-outs with neither a license nor education certificate earn a median monthly salary of \$1,920. Earning a license boosts their median monthly earnings to \$2,419 and earning a license along with an educational certificate yields a median monthly salary of \$4,008 for people who did not graduate high school.

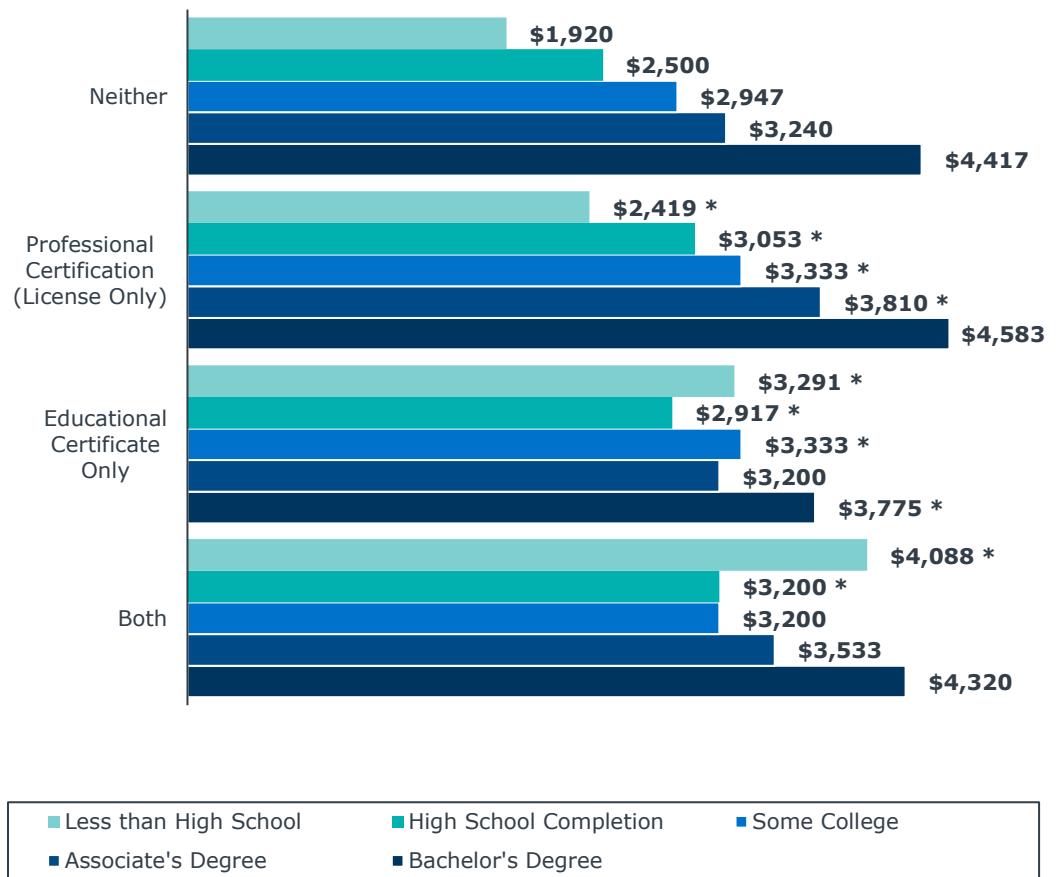
School districts concerned with student postsecondary success should encourage students who do not plan to pursue postsecondary education or students on the threshold of graduating to earn a professional certification. Students who plan to pursue postsecondary education experience lesser marginal benefits from pursuing a professional certification compared to students who enter the job market straight from high school.

42) Stephanie Ewert and Robert Kominski, "Measuring Alternative Educational Credentials: 2012. Household Economic Studies. P710-138.," *US Census Bureau*, 2014, <https://www.census.gov/prod/2014pubs/p70-138.pdf>.

43) Ewert and Kominski.

44) Ewert and Kominski.

Median Monthly Earnings by Education Level and Credential Type for Employed People 18 or Over in 2012⁴⁵



* Indicates a statistically significant (at the 0.10 level) wage difference compared to obtaining neither credential type.

Quality

Advise Labor-Market-Bound Students to Earn a Credential in a High-Wage Field of Study

While earning a credential generates the largest increase in income for those with lower educational levels, the field of study of the credential also impacts potential future earnings.⁴⁶ The graph below (**page 22**) shows the mean and median monthly earning for vocational certificate (typically a one-year long certificate program) holders for fields of study with available data. For example, the median monthly income for those who earned an engineering vocational certificate (\$3,833) is \$1,333 larger than the median monthly income for natural sciences/medicine vocational certificate holders (\$2,500).

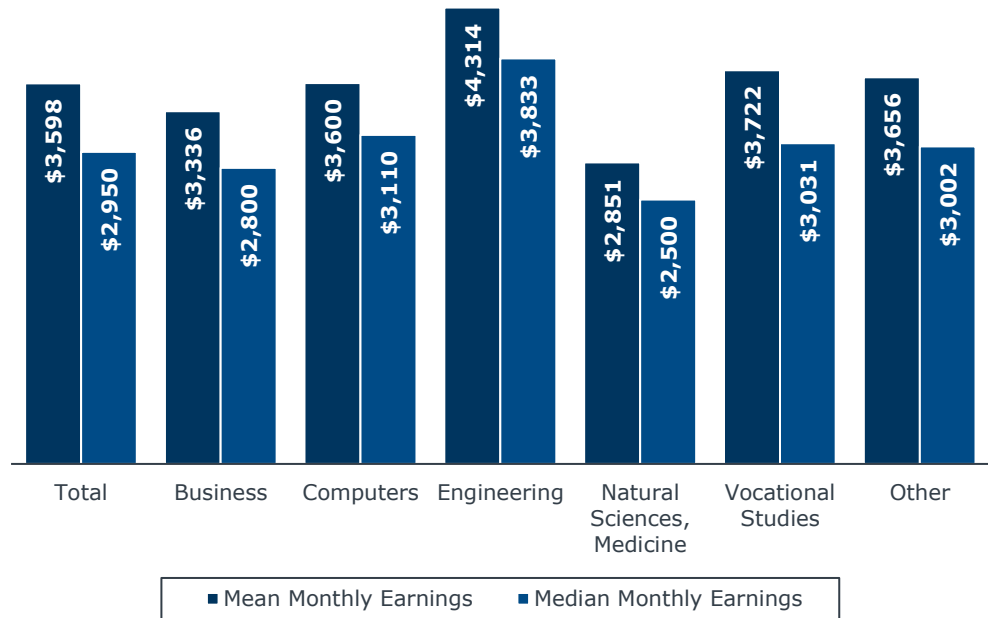
To maximize the potential for student postsecondary labor market success, school administrators can prioritize offering students the chance to earn credentials in high-wage fields related to engineering, computers, and vocational studies (e.g., carpentry). Administrators still may wish to offer a variety of credentials to support students with interest in other fields of study but should prioritize the highest wage-yielding credentials.

⁴⁵Ewert and Kominski.

⁴⁶Stephanie Ewert, "What It's Worth: Field of Training and Economic Status in 2009. Household Economic Studies. Current Population Reports. P70-129.," US Census Bureau, 2012, <https://www.census.gov/prod/2012pubs/p70-129.pdf>.

Wage data includes people who earned a vocational certificate outside of high school as well as those who may have earned it in high school.

Monthly Earnings of Vocational Certificate Holders by Field of Study for People 18 or Over in 2012⁴⁷



Prioritize Offering Students the Opportunity to Earn Long-Term Certificates Over Other Types of Credentials

The previously mentioned 2019 study by ExcelinED and Burning Glass Technologies reviewed wage data from Florida workers who earned at least \$20,000 a year and were at least 24 years old to determine the value of earning a credential. The observation group included both non-college goers and college graduates among other potential levels of education within this age group. Of the three credentials analyzed—certifications, licenses, and software credentials—only workers with certifications experienced wage increases.



Similarly, research from Dadgar and Trimble in 2015 analyzes the labor market returns on different types of community college credentials: short-term certificates (i.e., less than one year of full time study to complete), long-term certificates (i.e., more than one year of full time study to complete), and associate's degrees. Comparing the labor market returns of both certificate types, and separating the results by gender, Dadgar and Trimble find long-term certificates yield positive returns for men and women (**see below figure on page 23**), while short-term certificates yielded negative returns for both men and women.⁴⁸ The authors suggest the negative returns from short-term certificates might stem from the fact that short-term certificates are more popular and may flood the labor market.

47) Stephanie Ewert, "What It's Worth: Field of Training and Economic Status in 2009. Household Economic Studies. Current Population Reports. P70-129." Table 6, *US Census Bureau*, 2012, <https://www.census.gov/prod/2012pubs/p70-129.pdf>.

48) Mina Dadgar and Madeline Joy Trimble, "Labor Market Returns to Sub-Baccalaureate Credentials: How Much Does a Community College Degree or Certificate Pay?," *Educational Evaluation and Policy Analysis* 37, no. 4 (2015): 23–24, <https://files.eric.ed.gov/fulltext/ED533520.pdf>.

Returns on Wages for Long-Term and Short-Term Certificates⁴⁹

Long-Term Certificates



14.4%

Increase of returns on wages for women.



2.0%

Increase of returns on wages for men.

Short-Term Certificates



2.9%

Decrease in returns on wages for women.



0.2%

Decrease in returns on wages for men.

While Dadgar and Trimble focus on community college certificate offerings, high school administrators can rely on these findings and the findings from the ExcelinED and Burning Glass Technologies study to prioritize offering long-term certificates over short-term certificates. Offering long-term certificates will help students earn a credential with the most market value.

⁴⁹Dadgar and Trimble, "Labor Market Returns to Sub-Baccalaureate Credentials: How Much Does a Community College Degree or Certificate Pay?"

5) Research Methodology

Project Challenge

The Forum reviewed secondary research on the connection, or lack thereof, between workplace learning experiences, credentials, and career cluster identification/programs and postsecondary success. Whenever possible, the Forum identified secondary research that investigates the impact of specific characteristics (i.e., thresholds and levels) of workplace learning experiences, credentials, and career clusters/programs on postsecondary success.

Project Sources

- EAB’s internal and online research libraries (eab.com).
- Bersudskaya, Vera, and Xianglei Chen. “Postsecondary and Labor Force Transitions Among Public High School Career and Technical Education Participants.” Issue Tables. U.S. Department of Education, January 2011. <https://nces.ed.gov/pubs2011/2011234.pdf>.
- Castellano, Marisa, George Richardson, Kirsten Sundell, and James R. Stone III. “Preparing Students for College and Career in the United States: The Effects of Career-Themed Programs of Study on High School Performance.” *Vocations and Learning*, July 13, 2016. <https://doi.org/10.1007/s12186-016-9162-7>.
- Dadgar, Mina, and Madeline Joy Trimble. “Labor Market Returns to Sub-Baccalaureate Credentials: How Much Does a Community College Degree or Certificate Pay?” *Educational Evaluation and Policy Analysis* 37, no. 4 (2015): 399–418. <https://files.eric.ed.gov/fulltext/ED533520.pdf>.
- Dortch, Cassandra. “Career and Technical Education (CTE): A Primer.” CRS Report for Congress. Washington, DC: Congressional Research Service, 2014. <https://fas.org/sqp/crs/misc/R42748.pdf>.
- Ewert, Stephanie. “What It’s Worth: Field of Training and Economic Status in 2009. Household Economic Studies. Current Population Reports. P70-129.” US Census Bureau, 2012. <https://www.census.gov/prod/2012pubs/p70-129.pdf>.
- Ewert, Stephanie, and Robert Kominski. “Measuring Alternative Educational Credentials: 2012. Household Economic Studies. P710-138.” US Census Bureau, 2014. <https://www.census.gov/prod/2014pubs/p70-138.pdf>.
- Finch, Michael D., Michael J. Shanahan, Jeylan T. Mortimer, and Seongryeol Ryu. “Work Experience and Control Orientation in Adolescence.” *American Sociological Review* 56, no. 5 (1991): 597–611. www.jstor.org/stable/2096082.
- Gamboa, Vitor, Maria Paula Paixão, and Saúl Neves de Jesus. “Internship Quality Predicts Career Exploration of High School Students.” *Journal of Vocational Behavior* 83, no. 1 (August 1, 2013): 78–87. <http://www.sciencedirect.com/science/article/pii/S0001879113000651>.
- Graham, Kate, and Jennifer Morrow. “Required High School Internships.” *Techniques* 88, no. 3 (2013): 52–55. <https://eric.ed.gov/?id=EJ1016383>.
- Jacobson, Louis S., and Christine Mokher. “Florida Study of Career and Technical Education. Final Report.” Arlington, VA: CNA Corporation, 2014. <https://pdfs.semanticscholar.org/b7dc/597ecd6f2eddc66cd14a07a8c1b56268bdb.pdf>.

- Kemple, James J., and Cynthia J. Wilner. "Career Academies: Long-Term Impacts on Work, Education, and Transitions to Adulthood." New York: MDRC, July 6, 2012. <https://www.mdrc.org/publication/career-academies-long-term-impacts-work-education-and-transitions-adulthood>.
- Mortimer, Jeylan T. "The Benefits and Risks of Adolescent Employment." *The Prevention Researcher* 17, no. 2 (2010): 8. <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC2936460/pdf/nihms220511.pdf>.
- Mortimer, Jeylan T., and Jeremy Staff. "Early Work as a Source of Developmental Discontinuity During the Transition to Adulthood." *Development and Psychopathology* 16, no. 4 (2004): 1047–70. <https://www.cambridge.org/core/article/early-work-as-a-source-of-developmental-discontinuity-during-the-transition-to-adulthood/5D7047754B5F3FF673109D4E296CF01C>.
- "National Assessment of Career and Technical Education." U.S. Department of Education, September 2014. <https://www2.ed.gov/rschstat/eval/sectech/nacte/career-technical-education/final-report.pdf>.
- Plasman, Jay S., Michael Gottfried, and Cameron Sublett. "Are There Academic CTE Cluster Pipelines? Linking High School CTE Coursetaking and Postsecondary Credentials." *Career and Technical Education Research* 42, no. 3 (December 2017): 219–42. <https://doi.org/10.5328/cter42.3.219>.
- Stern, David, Neal Finkelstein, James R. Stone, John Latting, and Carolyn Dornsife. *School to Work: Research on Programs in the United States*. The Stanford Series on Education and Public Policy. Routledge, 1995.
- Stern, David, Neal Finkelstein, Miguel Urquiola, and Helen Cagampang. "What Difference Does It Make If School and Work Are Connected? Evidence on Co-Operative Education in the United States." *Economics of Education Review* 16, no. 3 (1997): 213–29. <https://EconPapers.repec.org/RePEc:eee:ecoedu:v:16:y:1997:i:3:p:213-229>.
- Walsh, Matthew, Layla O’Kane, Gilberto Noronha, and Bledi Taska. "Where Credentials Meet the Market: State Case Studies on the Effect of High School Credentials on Educational and Labor Market Outcomes." *ExcelinED / Burning Glass Technologies*, June 2019. https://www.burning-glass.com/wp-content/uploads/credentials_meet_market_report.pdf.
- "What Is a Credential?" Association for Career and Technical Education, 2018. https://www.acteonline.org/wp-content/uploads/2018/02/What_is_a_Credential_71417.pdf.