

Workplace Readiness: Career and Technical Education in High School

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Bragg, D. D., and Ruud, C. M. (2007). Career pathways, academic performance, and transition to college and careers: The impact of two select career and technical education (cte ) transition programs on student outcomes. Retrieved from <https://files.eric.ed.gov/fulltext/ED497342.pdf>

The study examined the effects of career and technical education (CTE) transition programs on student matriculation from secondary to postsecondary education. This analysis observed student persistence in college, and whether the transition programs were related to remediation, credit attainment, some terms attended, and certificate or degree attainment. Results focused on students' high school academic success, their progression from high school to college and careers, and their college performance, retention, and credential attainment. CTE students scored pointedly higher than their matched non-CTE counterparts on assessments. CTE transition program students were also substantially more likely than non-CTE students to report having a clear career path and a plan to achieve their academic goals. This report demonstrates that CTE and academic preparation, offer promising opportunities for high school students to develop academic and employability skills that then promotes student success in preparing for careers in high demand occupational areas during their college education.

Castellano, M., Stringfield, S., & Stone, J. R. (2003) Secondary career and technical education and comprehensive school reform: Implications for research and practice. *Review of Educational Research*,(73), 231-272.

In the 1990s, the federal government initiated mandate accountability requirements such as an improved academic achievement for CTE funding to continue. These requirements have necessitated an examination for ways to integrate CTE into more extensive school reforms that have enhanced student achievement as their goal. This examination observed research on the effects of CTE reform efforts in general and on attempts to merge CTE with wide-ranging secondary school reforms. The authors found that the juncture of CTE with comprehensive school reform is under-researched. They revealed that as change has come to the vocational areas, so must change also affect the college preparatory track. There is a consensus that the connection of vocational and academic reforms would combine the expertise of vocational educators in career preparation and applied to learn with more common academic concerns, thereby making the academic curriculum more relevant and engaging and making the vocational curriculum more appealing.

Chumbley, S. B. (2016). The impact of a career and technology education program. Sage. October-December 2016: 1–9. doi: 10.1177/2158244016678036.

The article reveals there is a shortage of qualified graduates for agriculture jobs within the United States. The authors report that the decline in student enrollment in colleges of agriculture is the cause of the shortage. The research showed that the tool that can increase college preparation for future graduates and help students succeed is in the agriculture dual-enrollment program. Dual enrollment allows high-school students to take agriculture classes while dually enrolled in a corresponding college course. The

researchers found that in general, teachers felt the agriculture dual-enrollment program had a positive effect on students, teachers, and the secondary campus as a whole.

Cooper, P. (2017, December). College completion rates are still disappointing. *Forbes*. Retrieved from <https://www.forbes.com/sites/prestoncooper2/2017/12/19/college-completion-rates-are-still-disappointing/#46d64a84263a>

The report tracks degree-seeking students that first entered college in fall 2011 and then, determine how many had attained a degree or certificate inside six years. The results show that just under half (45%) of students obtain a degree or certificate at the first institution they attend within six years of starting college. The report does not differentiate if the enrolled students came from CTE high school programs. This information is included because the expense and rigor of college could become a deterrent for students. Students who have certification to be employed may have the financial ability and determination to complete post-secondary institution due to career goals.

Dougherty, S. M. (2018). The effect of career and technical education on human capital accumulation: Causal evidence from massachusetts. *Education Finance and Policy*, (13), 119-148. doi:10.1162/EDFP\_a\_00224.

Dougherty (2018) examined the causal impact of participating in a specialized high school-based CTE program on high school perseverance, achievement, receiving professional certifications, and standardized test scores, with a concentration on individuals from low-income families, a group that is excessively represented in CTE and high school dropouts. The author used regression analysis on administrative data from

Massachusetts, to develop an understanding of the potential impact of specific CTE program participation. All estimates propose that participation in a high-quality CTE program increases the likelihood of on-time graduation from high school by 7 to 10 percentage points for higher-income students and encouragingly more significant effects for their lower-income peers and students. The report is a significant study because students from lower-income families are more likely to drop out of high school, so demonstrating the benefits of CTE involvement on this outcome is primarily persuasive from both an educational and social policy perspective.

Dougherty, S. M. (2016, April). Career and technical education in high school: Does it improve student outcomes?. Retrieved from <https://edexcellence.net/publications/career-and-technical-education-in-high-school-does-it-improve-student-outcomes>

In this study Dougherty (2016), coordinated with the Arkansas Research Center to access and analyze their education database, which combined secondary, postsecondary, and labor market information. It examined if Arkansas students with more significant experience in CTE are more likely to graduate, register in a two-year college, be employed, and have higher wages. The findings revealed students who were concentrated more in CTE coursework were more probable to graduate high school by 21 percentage points in comparison to similar students. The results of this study propose that CTE offers the most significant improvement to the students who may need it, boys, and students from low-income families. The report was chosen to reflect the academic success when most students took CTE courses at their comprehensive high school.

Dougherty, S. M., and Lombardi, A. R. (2016, December) From vocational education to career readiness: The ongoing work of linking education and the labor market. *Review of Research in Education*, (40), 326–355. doi: 10.3102/0091732X16678602

The authors state that the current focus on college and career readiness (CCR) in education policy emphasizes practical elements of education and the need for learning to relate to the world of work. Particular forms of educational training evolved from a fundamental point of conflict about the purpose of education. Is the purpose of education to enlighten the individual or make the individual a valuable worker? The answer should be a mixture of both perspectives because education and its impacts affect the individual and society at large. The role of public education should support the individual in both endeavors. The revival of CTE as a pathway out of poverty and advancement to meet career goals should be incorporated in all school settings. The report highlights the need for a return to the critical analysis of how CTE may or may not be paying off for lower-income students, students of color, and women. They also state the role of CTE in facilitating the transition to postsecondary education and employment is in need of additional updating.

Fletcher, E. C., and Tyson, W. (2017) A longitudinal analysis of young adult pathways to STEMH occupations. *Career and Technical Education Research*, 42(1), 35-55. doi: 10.5328/cter42.1.35.

This study examined young adults who enter Science, Technology, Engineering, Mathematics, and Health (STEMH) technician and professional jobs using the 1997

National Longitudinal Survey of Youth (NLSY) dataset, tracking high school students from 1997 to adulthood in 2009. The focus was on high school achievement and career and technical education (CTE) participation, to determine the factors that are contributing to the fulfillment of STEMH technician and professional careers. The researchers showed positive results for students earning high school industry certifications, postsecondary enrollment (2-year and 4-year institutions), and degree attainment. The finding recommends that strategies should focus on increasing the participation of minorities and women in STEMH fields include strengthening high school CTE programs to promote career awareness as a means to attract and retain students in STEMH pathways.

Halber, D. (2016, September) It's time for vocational schools to get some respect. Retrieved

from

<https://www.bostonglobe.com/magazine/2016/09/28/workschool/BapGIJ8WGrI5cdQuDmcmNI/story.html>

The article examined the growing vocational education movement in the state of Massachusetts. The Commonwealth of Massachusetts has a growing interest in vocational schooling. Students want into technical schools for the job opportunities. The Commonwealth's 55 vocational schools have about 48,000 students, but more than 3,000 others are wait-listed at schools without spaces to accommodate them. Massachusetts CTE schools are stretched thin at a time when local employers anticipate the majority of jobs they will create in the next few years will be well suited to CTE school grads. The local business owners were surveyed, and 75 percent said they prefer to hire vocational

graduates for entry-level positions and 61 percent for higher level jobs. Presently many of the state's vocational schools, now see higher MCAS passing rates than the state's comprehensive schools and have average dropout rates of below 1 percent, and send 57 percent of their students to postsecondary schools.

Herold, B. (2017, September). Preparing students for tomorrow's jobs: 10 experts offer advice to educators. *Education Week's Special Report: Schools & The Future of Work*.

Retrieved from <https://www.edweek.org/ew/articles/2017/09/27/preparing-students-for-tomorrows-jobs-10-experts.html>

Education Week spoke with leading experts in the fields of artificial intelligence, computer science, economics, education, and history. One expert stated that there should be a significant push to bring computer-science education to every U.S. school. Schools need to shift their emphasis away from rote practice, and towards a conceptual understanding of both content and problem-solving processes. Manufacturing employers across the U.S. wanted workers with the ability to read an instructional manual, perform community college level algebra, and get along well with co-workers. Students should familiarize themselves with using data to make decisions because the world is going to be besieged with data. The result is most occupations will continually evolve in unpredictable ways. An expert stated that the best we can do is create strong career pathways and hope they evolve.

Im, E., Johnson, G., & Vu, T. (2017) Vocational education, per capita income, and employment in the US. *Business and Economic Research* (7), 392-403.



The authors disclose that vocational education appears to affect changes in per capita income and employment positively. The researchers compared and contrasted vocational education with university education by using data on the number of four-year college graduates. The results showed that the vocational education elevates per capita revenue and employment more than university education in the short term, but less than the latter in the long term. The results also revealed that the effect of university education on per capita income is lower than that of community college education in the short run. The long-run effect is contradictory when university education becomes more beneficial economically.

Jacob, B. A. (2017, October) What we know about career and technical education in high school. Retrieved from <https://www.brookings.edu/research/what-we-know-about-career-and-technical-education-in-high-school/>

The article reveals that prior non-experimental evidence submits that students who participate in secondary CTE curricula have higher employment and wages than demographically-similar peers in the short run. The benefit of CTE education stem from an in-depth study of a precise area consistent with the current trend toward “pathways of study” within CTE. The students participating in CTE are different in many ways than other youth who do not participate in CTE since they typically self-select into vocational programs. These program choices reflect that the students who participate must be at least to some extent motivated and informed. CTE can encourage students to attend school more regularly and be more engaged, and consequently improve core academic skills. Jacob (2017) reveals that states have been very vigorous in passing laws, issuing

regulations and disseminating policies about CTE. States now need to step up and promote new research agendas that can help ensure these new initiatives are successful.

Jobs for the Future (n.d.). Retrieved from <https://www.jff.org/what-we-do/impact-stories/pathways-to-prosperity-network/#building-college-and-career-pathways-for-the-21st-century-and-beyond>

According to their website, Jobs for the Future (JFF) collaborates with national leaders in education, workforce development, business, technology, government, and philanthropy. They partner with U.S. education and workforce systems meet state and regional talent needs and prepare young people for careers. JFF's Pathways to Prosperity team supports state and regional partners to build career pathway structures for high school and college students. One focus area gives students a way to earn college and career pathway "endorsements" on their high school diplomas. An endorsement stipulates that a student is prepared for college and career in any of the specified industry areas (health, IT, business, manufacturing, and engineering) that represent the state's economic development priorities. JFF and local education systems are now mapping competencies in the three remaining endorsement industry areas of agriculture, arts and communication, and human services with a focus on education.

Lambeth, J. M., Joerger, R. M., & Elliot, J. (2018, May). Merits of creating a revised cte national research agenda for 2020. *Journal of Research in Technical Careers*, (2). Retrieved from <https://digitalscholarship.unlv.edu/cgi/viewcontent.cgi?article=1035&context=jrtc>

The authors suggest that the National CTE Research Agenda implemented in 2008 should be revised and updated to reflect the current issues and policies of the career and technical education (CTE) profession. They state that research and scholarship in education, specifically career and technical education, has seen an alteration in thinking and perspective over the past several decades. The most important influences in determining CTE research have come from federal legislation and the viewpoints about the nature of vocational education. The authors recommend that the National CTE Research Agenda should be revisited at a minimum every five years to remain relevant. The goal is to create a united and informed agenda that will transform policy, encourage innovation in scholarly activities, and promote improved outcomes for all CTE stakeholders.

Plank, S. (2001). Career and Technical Education in the Balance: An analysis of high school persistence, academic achievement, and postsecondary destinations. National Research Center for Career and Technical Education. Retrieved from <http://www.nrccte.org/resources/publications/career-and-technical-education-balance-analysis-high-school-persistence>

This research discusses how CTE and academic curricula can co-exist in U.S. high schools. The study examines the relationship between the balance struck between CTE and academic course-taking during the high school years, and academic achievement, persistence high school, and postsecondary destinations. The data originated from the National Education Longitudinal Study of 1988. The participants' were eighth graders in U.S. schools that completed surveys, cognitive tests, and provided high school transcript

information. The information collected and analyzed between 1988 to 1994, with participants until they were two years beyond high school graduation. Some of the results showed CTE, and academic course-taking can lower the risk of dropping out for some students. The report was chosen to provide research to promote efforts to integrate CTE and academic offerings to allow individuals to have multiple attractive options available after high school.

Plank, S. B., DeLuca, S., and Estacion, A. (2008). High school dropout and the role of career and technical education: A survival analysis of surviving high school. *Sociology of Education* 2008, (81), 345–370.

This article uses figures from the National Longitudinal Survey of Youth 1997 to examine high school dropout and its connotation with the high school curriculum. It studies how combinations of career and technical education (CTE) and core academic courses influence the likelihood of leaving school. The authors explore whether CTE, in combination with academic courses, predicts dropping out. There have been efforts to improve occupational education programs not only to prepare students for jobs but to increase their educational attainment. A combination of about one CTE course for every two core academic courses is linked with the lowest risk of dropping out after additional variables the models are controlled. The finding suggests that a mid-range mix of experience with CTE and an academic curriculum can reinforce a student's attachment to or motivation while in school.

Schwartz, R. B. (2016) The career pathways movement: A promising strategy for increasing opportunity and mobility. *Journal of Social Issues*, (72), 740—759. doi: 10.1111/josi.12192.

The author reveals that in the 1950s and 1960s, strong vocational programs might have served White students well in preparing them to enter apprenticeship programs in such unionized, well-paying occupations as plumbing, construction, and electrical work, but because of continued discrimination, such fields were mostly closed to students of color. Consequently, ensuing generations of African American and Latino parents reasonably viewed vocational education with deep suspicion because students of color were too often shoved off to low quality, low-demand vocational programs leading only to dead-end jobs. Presently college-going rates among students taking three or more related vocational courses in high school are higher than those of their peers. The author writes that the career pathways movement, intended to link young people to middle-skill occupations in such expanding fields as information technology, health care, and advanced manufacturing, offers a promising way to upward mobility for those students not well served by our existing education system.

U.S. Department of Education (2018). *Career and Technical Education Programs in Public School Districts: 2016–17*. Washington, DC. Retrieved from <https://nces.ed.gov/pubs2018/2018028.pdf>

This report came from the 2016–17 survey “Career and Technical Education Programs in Public School Districts” and presents nationally representative data on career and

technical education (CTE) programs. Career and technical education (CTE) programs defined by the U.S. Department of Education as a sequence of classes at the high school level that equips students with the academic and technical knowledge and skills required to prepare for additional education and careers in current or emerging professions. The survey was mailed to around 1,800 public school districts with high school grades in the United States. The weighted response rate was 86 percent, about 1,530 responding districts. Seventy-three percent of districts presented CTE courses for which students could receive both high school and postsecondary credit; 61 percent offered CTE classes in which students could earn high school credits in math, science, English-language arts, or social studies; and 30 percent provided online CTE courses, including blended/hybrid courses. This report confirms that the federal government is vested in the success of students and the growth of the U.S. workforce.

U.S. Department of Education (2013, November). *NCES Data Point Trends in CTE course-taking*. Washington, DC. Retrieved from <https://nces.ed.gov/pubs2014/2014901.pdf>

The graphic from figure 1 was used because it showed that from 1990 to 2009, the average quantity of CTE credits earned by U.S. public high school graduates decreased, from 4.2 to 3.6, while the average amount of credits earned in other subject areas increased. While, in contrast, average credits earned in core academic fields (i.e., English, mathematics, science, and social studies) rose between 1990 and 2009. The job-related areas with declining participation were business, manufacturing, computer and information sciences, engineering technologies, and repair and transportation, with business being the area of most significant decline. Occupational areas with increasing

participation were communications and design, health care, public services, and consumer and culinary services, with communications and design being the area of the most substantial increase. The information supports the view that CTE needs to increase because there continues to be a shortage of qualified graduates for jobs within the United States.

Wyman, N. (2015, September). Why we desperately need to bring back vocational training in schools. Retrieved from <https://www.forbes.com/sites/nicholaswyman/2015/09/01/why-we-desperately-need-to-bring-back-vocational-training-in-schools/#5608eccd87ad>

Vocational education of the past was seen as tracking. Some negatively viewed ability tracking as educators or parents, who believed students were allotted to tracks not by ability, but by socio-economic status and race. In education, the focus shifted to preparing all students for college, and college prep is still the crux of the U.S. high school curriculum. The author believed people have a vast and diverse range of different skills and learning styles and not everyone can go to college. The (2015) figures from the U.S. Bureau of Labor Statistics (BLS) display that around 68% of high school students go to college. Less than 50% complete college within six years and over 30% graduate with neither academic nor job skills. The author points out that the manufacturing sector is growing and, creating the opportunity for challenging, well-paying, highly skilled jobs for people with the technical skills to do them. The return of CTE programs is desperately needed for the youth to have viable, financial futures for themselves and the U.S. economy.