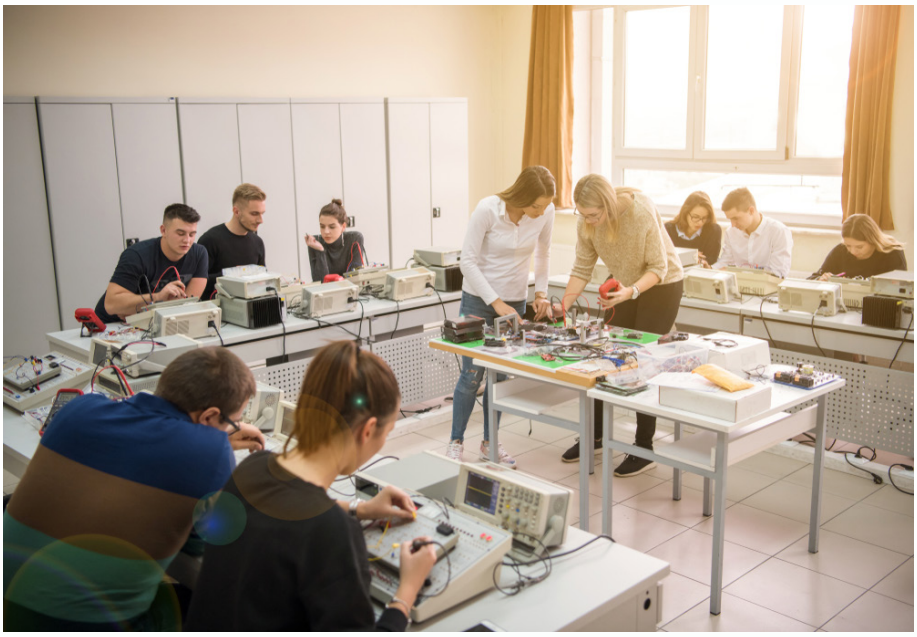
Tracking and the Future of Career and Technical Education: How Efforts to Connect School and Work Can Avoid the Past Mistakes of Vocational Education



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I. Executive Summary

Career and Technical Education (CTE) describes a variety of school-based efforts to connect what happens in school to what happens in the world of work. The term "career and technical education" has generally replaced "vocational education," and CTE initiatives are increasingly popular across the country. However, concerns remain about the availability of resources for different CTE pathways, their relative status, and the degree to which adults working within schools are problematically sorting students explicitly or implicitly into different course-taking pathways. This policy brief examines the tension that has often arisen between the provision of equitable educational opportunities and career and technical education. More specifically, it asks, *How might schools meaningfully support career exploration and preparation, while avoiding the tendency of prior vocational education to disproportionately sort students into distinct tracks by ethnic, racial, and/or socioeconomic characteristics?*

After summarizing the history of vocational education and its relation to tracking, the brief describes how vocational education evolved into CTE and identifies its various forms. The authors conclude with the following recommendations for enacting CTE in ways that support the equitable distribution of educational opportunity:

- In *whole-school models of CTE, school and district leaders* should monitor enrollment at the school and program levels by student subgroups to ensure equitable access. Whole-school models of CTE often have admissions criteria, which should be adjusted or eliminated if there are disproportionalities in access—if, for example, a

high-demand STEM program were shown to have a disproportionate number of higher income students. If admissions criteria are not adjusted in such a situation, students from minoritized backgrounds are likely to be underrepresented. Admission by randomized lottery is an example of such an adjustment.

- In *comprehensive high schools*, *administrators* should build a schedule that allows for participation in CTE electives without de facto tracking of students. Whether CTE is offered via a career academy or standalone courses, students should have access to a broad variety of coursework with minimal or no levels within subjects. In addition, school administrators should work actively to help students learn about careers that they may not have considered, to eliminate or reconsider prerequisites that may impede access, and to build teacher capacity for instructional differentiation to meet students' needs within heterogeneously grouped classes. They should also mount substantial information-sharing campaigns to inform students and families about current needs related to local workforce and postsecondary education options, as well as about potential earnings in those areas.
- *School district and state policymakers* must ensure equitable distribution of resources across schools and for students across districts to avoid de facto tracking of specific subgroups of students into specific careers.
- To avoid mistakes of the past that replicated social stratification, *researchers* should carefully monitor the racial, ethnic, and socioeconomic patterns of CTE in all of its forms. The efficacy and equity of contemporary CTE trends is uncertain because too little is known about CTE course-taking nationally over the last 10 years.

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II. Introduction

Career and Technical Education (CTE) is a term encompassing a variety of school-based efforts to connect what happens in school to what happens in the world of work.[1] Policymakers have shown increasing interest in CTE in recent years, in part because of the 2017 reauthorization of the Perkins Act and the 2015 reauthorization of the Elementary and Secondary Education Act (ESEA)—now the Every Student Succeeds Act (ESSA). Both reauthorizations explicitly embrace career readiness, marking a shift from the No Child Left Behind emphasis on improving academic proficiency to a more nuanced set of possible pathways into adulthood, including various configurations of traditional academic and career preparation. Echoing trends at the federal level, many states have passed CTE bills—a total of 87 bills across 32 states and the District of Columbia in 2018 alone.[2] Since the 2006 Perkins legislation, CTE has replaced the term vocational education in both common use and in legislation.[3] However, despite the new language, concerns remain about whether new CTE options will be more equitable than vocational education of the past, which was often characterized by a variety of implicit or explicit sorting systems that decreased academic expectations for identifiable subgroups of students.[4]

If an ideal function of schools is to lessen inequality, then recent CTE trends should be scrutinized. What type of CTE efforts, and under what conditions, can lessen inequality? Under what conditions might they instead reproduce existing societal inequalities in social class and career outcomes? This policy brief examines the tension between the provision of equitable educational opportunities and career and technical education. It asks: How might

schools meaningfully support career exploration and preparation while avoiding the tendency of prior vocational education to disproportionately sort students into distinct tracks by ethnic, racial, and/or socioeconomic characteristics?

III. History of Vocational Education and Tracking

The Emergence of Vocational Education in the U.S.: Intertwined with Race and Class

Vocational education has a long history in the U.S. public education system and has been at the center of some of the most contentious debates about the purpose of public education. While apprenticeship and workforce training took place outside of schools throughout the nation's history, the formal structures to support the intersection of education and work began at least as early as the mid-19th century, when the Morrill Act of 1862 established the first land-grant universities in order to build capacity for agricultural and mechanic arts. By the early 20th century, there was a rich debate about whether the educational curriculum for some populations should be vocational. The argument for vocational training was bolstered by rapid industrialization and the growth of cities, as well as the push by business to have public education provide some of the formal training they wanted their future employees to have. The result of these forces was the federal Smith-Hughes Act of 1917, which brought vocational education into primary and secondary public education.

Vocational education, however, has a long and checkered history often intertwined with race, class, and gender. One example comes from the debate over what type of education was "necessary" and "appropriate" for African Americans after the Civil War. Booker T. Washington successfully advocated for institutions of higher education for African Americans to teach skilled trades and for African Americans to focus on improving their economic opportunities without publicly critiquing pervasive racism. In contrast, W.E.B. DuBois endorsed a more traditional arts and sciences education, at least for those in "the talented tenth."[5] Reflecting on these tensions and the role of race in limiting opportunities for African Americans, James Anderson (1988) writes in *The Education of Blacks in the South, 1860–1935,* "Both schooling for democratic citizenship and schooling for second-class citizenship have been basic traditions in American education . . . usually embraced by the same leaders."[6] Parallel, separate, and unequal school systems for Black and White children expanded in the decades after the Civil War.[7]

Such debates about the purpose of education and its relationship to workforce preparation were not confined to African Americans navigating separate and unequal systems of education. Compulsory school attendance laws passed in the Common School Reform era continued to broaden the student population, especially by targeting newly arrived immigrants from southern and eastern Europe who were often perceived as in need of "Americanizing" and were subject to widespread negative generalizations about their behavior and intelligence.[8] As a way to manage increased numbers of students, many urban school systems experienced significant organizational changes during the Progressive Era.[9] Whereas during this period "pedagogical progressives" like John Dewey were advocating for education as a

means of developing an informed electorate and citizenry and were critical of education as narrow job preparation,[10] "administrative progressives" introduced new practices that increased stratification.

For example, "administrative progressives"[11] developed the innovation of grouping students into classes according to their age, a structure developed in response to larger schools replacing one-room schoolhouses. They also standardized courses of study and developed assessments to measure students' progress in those courses. Urban schools generally consolidated into centralized districts governed by a school board and a new type of leader—a professionally trained superintendent.[12] Further, administrative progressives refined and expanded a type of within-school organizational differentiation known as tracking, consisting of different courses of study for different groups of students. They also developed an assessment system for determining the most "appropriate" course of study for a particular student given the role they expected that student to play in society. Generally, these future roles were determined by an IQ test, despite IQ tests' many flaws.[13] In this way, administrative progressives believed they could make schools better serve society, with the expansion of vocational education squarely in line with this goal. High school curricula were split, or differentiated, into academic, vocational, and commercial courses of study, or "tracks"—tracks which tended to reproduce inequalities by social class. Kantor (1988) describes the vocational track as mostly composed of immigrants and students from lower- and sometimes middle-class backgrounds. Students in the upper class were most often placed in the academic track.[14]

Course-Taking Patterns and Tracking After the Progressive Era

Two types of curricular differentiation described by Sørensen (1970) provide one way of conceptualizing course-taking patterns.[15] The first, "horizontal curricular differentiation," allows for exposure to many different areas of knowledge—a broadening of student experience. In contrast, "vertical curricular differentiation" involves breaking each area of knowledge into groups by "level," "pace," or some other distinction—a narrowing of student experience.[16] Vertical differentiation is what we might describe as the subject-by-subject leveled groups common in secondary schools today—perhaps labeled "honors" as a higher level and "college preparatory" as a lower level. The tension between horizontal and vertical differentiation is key to considering the relationship between CTE and tracking—since tracking is a form of vertical differentiation. Tracking research has clearly documented that students in different tracks within a subject experience different instruction and that tracking produces a negative effect on both students' opportunity to learn and their outcomes.[17]

Because CTE generally involves broader course offerings with greater focus on application to workplace skills compared to other "traditional" academic courses, it provides greater horizontal differentiation. However, if CTE programs and courses do not provide students the opportunity to meet college entrance requirements in terms of requisite knowledge and skills, the increased horizontal differentiation can nevertheless narrow the students' future opportunities.

The vertical/horizontal distinction is also relevant in thinking about how curricular differ-

entiation has changed over the 20th and 21st centuries. As Dougherty and Lombardi (2016) point out, the 1959 Conant report highlighted the importance of a high school diploma for many careers.[18] It promoted horizontal curricular differentiation—increased subject offerings in high schools.[19] Rather than segmented academic or vocational course tracks, the Conant report influenced secondary schools to provide a variety of individual courses from which students could choose. Yet, even as such horizontal differentiation increased, vertical differentiation—tracking—in core academic areas like English, math, and science also increased. This corresponded with, and was influenced by, the Great Society legislation and reforms of the 1960s, which aimed to use CTE as a way to fight concentrated poverty, especially in rapidly growing cities.

Detracking Efforts

In the 1980s, Jeannie Oakes's groundbreaking book *Keeping Track* highlighted the differences in instruction across high- and low- tracks that she observed in 25 secondary schools in the 1970s as part of John Goodlad's *A Study of Schooling*.[20] Because the Conant report prompted expanded course offerings in the decades after it appeared, the formal distinction between academic and vocational tracks may have been less sharp, overall, by the 1980s. However, subsequent detracking research highlighted the persistence of tracking as an organizational structure, and privileged parents often vehemently resisted the breakdown of track structures they perceived as benefiting their children, a concept sometimes called "opportunity hoarding."[21] Further, race and class were again bound up with track structures in the desegregation efforts of the 1970s and 1980s, as schools that appeared desegregated from the outside often contained racially identifiable tracks within, or "second generation segregation."[22]

This line of research on the harms of tracking and its durability as an organizational structure prompted some efforts to detrack schools in at least some subject areas, attempting to lessen vertical differentiation in core content areas. As one detracking strategy, schools began to allow students to opt in to advanced courses. However, these strategies did not prove effective in increasing racial diversity in advanced courses or meaningfully altering course-taking patterns. Not all students knew about their course-taking options, and track structures shaped students' identities and confidence, lowering their likelihood of opting into an advanced course.[23] Some detracking efforts were not sustained for the long term, and tracking continues to be a common organizational practice in comprehensive schools. However, there are high schools, such as South Side High School in Rockville Centre, New York, that have remained committed to detracking their academic classes. Another high school that has detracked some of their academic coursework is Evanston Township High School, just north of Chicago, Illinois. Evanston detracked freshman history, biology, and English within the last 10 years, finding that after detracking, far more students of color enrolled in Advanced Placement courses in 11th and 12th grades.[24]

Evanston also offers a variety of CTE coursework, most of which has no prerequisites and offers a pathway to honors credit.[25] Perhaps because detracking has tended to focus on academic subjects, scholars have seldom examined the interaction of detracking and CTE pro-

grams. Even though it was not sustained at scale, the detracking movement brought attention to the idea of course-taking patterns across subgroups of students as a significant source of inequality, as well as a reexamination of the purposes, goals, and students who tended to experience vocational education.

The Shift from Vocational Education to CTE

During the 1990s, concurrent with the post-*Nation at Risk* push for state education standards, the vocational education community attempted to rebrand vocational education as CTE. The name change was a step away from a system that had been chastised for evidence of tracking and racial and socioeconomic segregation, as well as a way to acknowledge the purposeful focus on re-coupling education and preparation for work and career reflected in the 1984 Carl D. Perkins Act and its block grants for vocational education. In particular, the CTE name change also acknowledged that work had come to include not only mechanical and hands-on labor but also more technical/technologically driven and service-based work involving career pathways rather than entry into a single job.

The term CTE eventually became codified in the 2006 federal Perkins law, and the contrast between CTE and traditional vocational education continued to evolve in ways that reflect the larger shift in the world economy. Notably, the increased role of information technology, growth in the demand for highly differentiated health services, and the expansion of new forms of manufacturing have changed common CTE pathways. Biotechnology and green enterprises also continue to expand these definitions.

IV. Review of the Literature on CTE

Participation in CTE has changed over time as program offerings have changed and school accountability policies have reduced elective course-taking, though across all periods White students and males participated in CTE at disproportionately high levels. The most recent nationally representative data from 2013 show that over the previous 20 years, the share of both boys and girls who took three or more aligned CTE courses in the same program of study (CTE concentrators) fell, though a larger share of boys chose to concentrate during that period.[26] Also consistent over time is the fact that larger shares of White students chose to complete a CTE concentration, relative to their Black or African American, Hispanic, or Asian/Pacific Islander peers.[27] These patterns are similar to those in more recent scholarship using state-specific data, suggesting these patterns may hold even now.[28] The recent reauthorization of the Perkins Act means that new national data are being collected and more recent participation levels will be available in a few years.

Overall, the evidence regarding CTE suggests positive impacts on workforce and earnings, with more ambiguous effects on educational outcomes.[29] However, concerns about student selection into CTE programs complicates evaluation of the evidence on their potential positive or negative outcomes, as interest in CTE programs may be driven by unobserved factors such as family history, socioeconomic status, or forms of tracking. There has been a recent growth of research in CTE that can support causal inference, and this work also now points

to positive impacts of CTE on attendance and high school completion.[30] However, each of these beneficial outcomes was found in specialized high schools where all students focus on CTE, as opposed to CTE programs within comprehensive high schools, which follow a more traditional approach to scheduling and organizing coursework.

Evidence in other settings has been non-causal and more ambiguous on estimates of impact. For instance, Gottfried and Plasman (2018) show some potential for benefits of CTE experiences on high school graduation using nationally representative data; however, they employ a research design that does not support strong causal inference. Still, their recent findings suggest echoes of earlier work that found evidence that CTE participation in high school was associated with students feeling more connected to school and school completion.[31] These findings also are mirrored in another study using nationally representative data.[32]

International studies, too, provide some insight into the relationship between CTE and social mobility, through comparative examinations of countries with different models of tracking and vocational education. For example, Shavit and Müller (2000) compared 11 countries, finding that in most cases, vocational education serves as a safety net, providing graduates with a better chance of employment than high school graduates who do not attend college. The more specialized vocational training is, the more students seem to benefit.[33] Recent work from Finland suggests large and sustained wage benefits for students who were eligible for vocational education and training. The benefits persist 17 years after initial employment, and the magnitude suggests that they pass any reasonable cost-benefit test.[34]

Very limited work exists on whether and how CTE participation in high school may translate into college enrollment. Earlier work from Cellini (2006) suggested that technology preparation programs may have increased college enrollment, but only in two-year colleges.[35] More recent work from Brunner, Dougherty, and Ross (2019) shows negative impacts on seamless enrollment after high school, but no differences in eventual college enrollment by age 23.[36]

Other recent evidence capitalizes on changes in educational policy or practice that relate to the growing interest and reinvestment in CTE. Evidence from a competitive grants program in California suggests that receiving a grant to expand CTE programming leads to more spending on CTE and reductions in school dropout rates.[37] Work in Michigan has also demonstrated that changing the way funding is allocated to CTE course offerings yields more course offerings and course participation, though impacts on learning and completion are not yet known.[38] Thus, as approaches to structuring CTE are undertaken, policymakers and practitioners might more reasonably emphasize the scaling of existing models with an evidence base, with the understanding that the general effect of changes to funding structures may be less well known.

V. Recent Developments

Not only have CTE programmatic changes altered course offerings, they may also be starting to shift public opinion about the relationship between CTE and long-term economic success. Many high school CTE programs have clear pathways to community or four-year colleges,

with certificates and college degrees expected either at the point of job entry or as a career progresses. These changes are consistent with the name change to CTE and the goals of the Perkins reauthorization, as greater coherence between secondary CTE and postsecondary education becomes evident. The increased need for higher education within CTE pathways has broken down some of the earlier stigma that accrued to CTE students who were not college bound. Thus, the previous two decades of efforts to expand the range of CTE offerings to better mirror changing workplaces (that is, the decline of manufacturing and growth of information technology and health services) and to update the name and public perception of technical education seem to be making a positive difference.

Nor have changes in CTE been confined to names or program offerings. The models of CTE delivery have also evolved and expanded. For instance, though whole-school models of CTE have been around for more than three decades, "career academies" (small learning communities within a comprehensive school) and other CTE-dedicated high schools (where all students who enroll take some CTE electives and attend those schools full-time) are becoming increasingly popular. Perhaps based on the evidence provided by a longitudinal study of career academies and earlier studies dating back to the 1980s, several large districts have expanded their career academy offerings.[39] Notably among those expanding career academies are Wake County, North Carolina, as well as Nashville, Tennessee and Jefferson County, Kentucky. The latter two districts have converted nearly all high schools to a wall-to-wall career academy model.

CTE-dedicated high schools in other states have also seen growth in popularity—with many of them oversubscribed. CTE-dedicated schools in Massachusetts and Connecticut have seen increased interest over the last decade, and their oversubscription has allowed for the production of evidence of large positive impacts on student outcomes.[40] Similar growth of interest in CTE-dedicated schools has been noted in New Jersey and New York City.[41] STEM offerings within CTE have grown, likely because of job growth in these areas and increased demand for STEM courses. STEM-focused CTE programs may also reflect a desire to destigmatize CTE participation. The growth in demand for CTE-dedicated schools, especially STEM-focused programs, illustrates the changing openness towards CTE. It has also, however, raised questions about adequate access to such programs because, in most states where these options exist, interest in the schools exceeds capacity to serve students, thus creating the potential for unequal access to high-status, STEM-focused programs.

The popularity and broadened definition of CTE efforts in recent years complicates efforts to evaluate its implications for equity and equality.

Innovative models of CTE delivery embedded in comprehensive high schools have also been developed and expanded in the last decade. The most salient example is Linked Learning, which was developed in California and was meant to avoid the potential for CTE participation to devolve into de facto tracking. Linked Learning emphasizes the relevance of education and connection to the workforce, and includes work-based learning, academics that qualify students for entry into four-year colleges, and support systems. Early evidence of the effectiveness of this model and the fact that it was developed for use in different kinds of school settings (including comprehensive schools) have spurred increased interest, with expansions from California into Texas and Arizona.[42] Similarly, Seaside High School in Monterey, CA has

been nationally recognized as a National Education Policy Center "School of Opportunity" because of its innovative combination of career pathways with college preparatory coursework for all students. As reported in the school profile, "when faced with disappointing test scores in math, the school resisted creating a lower-track class with lowered expectations. Instead, the school's educators created team-taught classes combining coding and robotics, with students heterogeneously grouped."[43]

Interest in expanded models of CTE delivery began ahead of what is now a broad policy focus on "college and career readiness" (CCR), which was spurred by the reauthorization of ESEA as ESSA. There was an implied pivot within ESSA towards career readiness, and thus away from college for all. In line with this shift, state ESSA plans have changed graduation requirements to elevate the status of CTE coursework, insofar as CTE courses can fulfill graduation requirements aimed to better prepare students' transition to the workforce.. One risk in these policy changes, however, is differentiation in how the CCR requirements can be fulfilled. For instance, Advanced Placement and International Baccalaureate offerings are one way that many states allow CCR to be fulfilled, while CTE coursework is another pathway to meeting these requirements. While such flexibility does allow for the pursuit of different interests in schools, if traditional, academic courses are routinely used to satisfy CCR requirements for some students while CTE courses are used for others, a de facto college bound track may re-emerge.

The popularity and broadened definition of CTE efforts in recent years complicates efforts to evaluate its implications for equity and equality, as the CTE label encompasses multiple meanings and can include preparation for both high- and low-status careers.[44] An example of how CTE encompasses a broad range of career fields comes from Virginia, where Governor Ralph Northam recently distributed $600,000 across 16 schools to purchase new equipment for CTE "to prepare Virginia students for the jobs of tomorrow, which includes industries like high-tech manufacturing, bioengineering, health care, and skilled trades."[45] The type of equipment purchased for different kinds of schools epitomizes many of these divides—technical centers purchased computer numerical control plasma cutting equipment and a heavy equipment operator training simulator, while two of the state's Governor's schools purchased automated robotics equipment and a microcentrifuge.[46] Instead of within-school inequalities from CTE, as in the past when some students would be identified for a "vocational track," between-school inequalities in CTE may now be more common. For example, a recent article in *The Baltimore Sun* points out the uneven distribution of Baltimore's CTE offerings, with computer science generally only offered in more selective schools.[47]

VI. Discussion and Analysis

Conclusions

The growth in CTE's popularity and the explicit policy focus through both ESSA and the reauthorization of the Perkins Act suggest there are both new opportunities and new challenges in CTE-related education policy. The more mainstream CTE becomes and the more it includes pathways to high-paid STEM careers, the more potential it has to be co-opted

as a new form of opportunity hoarding,[48] in which privileged families exploit higher status CTE for advantages (for example, college credits through dual enrollment programs). The growth in interest and the broadened range of offerings included in CTE mean that demand for programs in health careers and STEM may expand, as may the average profile of CTE participants to include more women and students from higher SES backgrounds. While diversification can be an overall boon for CTE, it may also crowd out students, especially lower income students, if the STEM focus were to be accompanied by co-requisite requirements such as minimum test scores, or ranking procedures to admit students to high-demand programs. The potential also exists for stratification *within* CTE in these new structures. Careers traditionally have a status hierarchy, and when students are prepared for particular careers with higher or lower status, CTE replicates those hierarchies.

In general, there is substantial evidence across time that CTE in high school is associated with better employment and earnings, for males in particular, who have also been more likely to participate in CTE. More recent evidence suggests that whole-school models of CTE might create beneficial impacts on high school completion, with overall larger effects for boys and subgroups of students like those eligible for free- or reduced-price lunch.[49] Considerations for equitable CTE are contingent on the model of CTE: In whole school CTE, all students are engaged in some form of CTE, although there may be some status distinctions across the type of careers students are preparing for. However, one major concern in this model is the supposedly meritocratic approach to admitting students to these schools. In communities with heterogeneity in family income, students from lower class backgrounds can be crowded out through privileged parents' opportunity hoarding, creating additional between-school inequality.

CTE comprises an educational niche that may uniquely benefit a group who have not experienced improved outcomes during economic growth.

Comprehensive high schools have their own dangers, in which there could be two CTE pathways: the old vocational education of manufacturing and mechanics and the emerging new CTE of STEM, including computer science, and other higher status careers.[50] In other words, there may be "a tale of two CTEs" when both types of CTE are offered within the same school. There is also potential for differential CTE offerings between schools, as *The Baltimore Sun* article mentioned above concludes—in which some schools offer high-status CTE options, and other schools offer only lower status CTE. There is a similar concern for school-within-a-school models of career academies when certain pathways are seen as more desirable. Thus, the process used to select students should be scrutinized and adjusted to ensure equitable access.

Across the available research, there is mounting evidence suggesting that the largest benefits, particularly for short- to medium-term workforce outcomes, may be for boys. This is a salient finding given the long-term decline in male labor force participation and declining real wages for those with a high school diploma or fewer years of formal education.[51] Thus, CTE comprises an educational niche that may uniquely benefit a group who have not experienced improved outcomes either during the historically strong economic growth of the late 1990s or during contemporary economic growth.

Unanswered Questions

Despite the trends above, there are also unresolved questions:

- What are the opportunities and potential risks of the new CTE? How might policymakers and practitioners get ahead of the potential risks?
- Where might we find models of schools and districts that have equitable structures for CTE offerings? For example, career academies are located in both Nashville, TN and Jefferson County, KY; are these efforts making students' high school experiences more relevant, or are there ways that they continue the long tradition of vocational education that contributes to social reproduction?
- Is there evidence of racial and socioeconomic stratification within and among CTE programs, and are those programs themselves disproportionate in their racial and socio-economic composition?

VI. Recommendations

We believe that the best-case scenario is the whole-school model in which schools are dedicated to providing a variety of CTE offerings, offering opportunities for career exploration to all students, positive mentoring, and aligned academic and technical instruction.[52] Whole-school models may offer 10 to 15 different options, rather than the two or three typically available within a career academy in a comprehensive high school.

That said, the reality is that a wide variety of models exist, and so based on the discussion above, the following are our more inclusive recommendations for incorporating CTE in ways that maintain students' opportunity to learn. Suggestions are organized according to the two most popular CTE models: whole-school CTE and CTE embedded within comprehensive high schools, whether in a career academy or other structure. In any configuration, however, schools should be organized to ensure that students meet eligibility requirements for post-secondary education so that their future options remain broad.

- In *whole-school models of CTE*, *school and district leaders* should monitor enrollment at the school and program levels by student subgroups to ensure equitable access. Whole-school models of CTE often have admissions criteria, which should be adjusted or eliminated if there are disproportionalities in access—if, for example, a high-demand STEM program were shown to have a disproportionate number of higher income students. If admissions criteria are not adjusted in such a situation, students from minoritized backgrounds are likely to be underrepresented. Admission by randomized lottery is an example of such an adjustment.
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