CALDER Policymakers Council

Research Brief

CAREER AND TECHNICAL EDUCATION FOR STUDENTS WITH DISABILITIES

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Suggested citation:

Theobald, R. (2018). *Career and technical education for students with disabilities* (CALDER Research Brief). Washington, DC: National Center for Analysis of Longitudinal Data in Education Research. CALDER Policy Brief No. 6-0918-1.

The research reported here was supported by the Institute of Education Sciences, U.S. Department of Education, through Grant R324A150137 to American Institutes for Research. The writing and dissemination of this research brief was also supported by the National Center for the Analysis of Longitudinal Data in Education Research (CALDER), which is funded by a consortium of foundations. For more information about CALDER funders, see www.caldercenter.org/about-calder. Note that the views expressed are those of the authors and do not necessarily reflect those of funders or the institutions to which the authors are affiliated. The author would like to thank Tessie Bailey and Dan Goldhaber for comments that improved this brief.

Career and Technical Education for Students With Disabilities

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Highlights

- Career and technical education (CTE) is an increasingly popular policy lever for improving high school and postsecondary outcomes for students with disabilities (SWD).
- A large body of literature finds positive correlations between the participation of SWD in high school CTE courses and the probability that they graduate and find employment after graduation.
- Several recent studies show that, controlling for baseline differences between SWD who do and do not participate in CTE, these positive correlations hold for SWD who participate in a "concentration" of CTE courses in high school and are particularly strong for SWD in CTE-focused technical high schools.
- Despite this suggestive evidence, there is currently *no causal evidence* linking SWD participation in CTE and later outcomes for these students.

Executive Summary

It has been clear for decades that students with disabilities (SWD) who participate in career and technical education (CTE) tend to have better graduation and employment outcomes than SWD who do not, and a series of recent papers has shown that some of these relationships hold even when accounting for important observable differences between SWD who do and do not participate in CTE. In particular, SWD who participate in a "concentration" of CTE courses in high school are more likely to graduate and be employed after graduation than observably similar SWD who participate in less CTE, and recent evidence also suggests a strong relationship between participation in CTE by SWD in CTE-focused technical schools and their likelihood of graduating and getting industry-recognized certifications.

However, despite this suggestive evidence and the popularity of CTE as a policy lever for improving outcomes for SWD, it is vital to recognize that there is *no experimental evidence* linking CTE participation to better outcomes for SWD. This is problematic because there are good reasons to believe that SWD who participate in CTE may be more motivated to pursue employment than SWD who do not and that the relationships described above could be the result of this nonrandom sorting into CTE courses and schools rather than the *causal effect* of CTE on outcomes for SWD. Thus, there needs to be more causal research about CTE for SWD—perhaps along the lines of recent experimental studies about the impacts of career and academies and other CTE-focused schools on student outcomes (not specific to SWD)—to support the rapid expansion of CTE opportunities for SWD.

What Is the Issue?

A central goal of the 2004 reauthorization of the Individuals with Disabilities Education Act (IDEA)—through which nearly 6.5 million eligible students with disabilities receive special education services—was to improve the postsecondary outcomes (including "training, education, employment, and, where appropriate, independent living skills" [IDEA, 2004]) of SWD. This was motivated by decades of research (e.g., Affleck, Edgar, Levine, & Kortering, 1990; Karpinski, Neubert, & Graham, 1992; Murray, Goldstein, Nourse, & Edgar, 2000; Rabren, Dunn, & Chambers, 2002; Wagner 1992, 1993) demonstrating that SWD lagged far behind their peers in terms of these postsecondary outcomes. However, there is little evidence that these gaps have closed in subsequent years (Wagner, Newman, Cameto, Garza, & Levine, 2005; Wagner, Newman, Cameto, Levine, & Garza, 2006; Newman, Wagner, Cameto, Knokey, & Shaver, 2010).

Not surprisingly, these gaps have spurred a tremendous amount of research about interventions that may improve these outcomes for SWD. One intervention that has received a great deal of attention in the research literature is CTE coursework in high school, broadly defined as coursework that provides academic and technical skills for future careers and independent living. The next section describes what is known from this literature about the relationships between CTE participation and later outcomes for SWD.

What Is Known?

Early work on the connection between CTE (or, in earlier work, "vocational education") participation and postsecondary outcomes for SWD consists primarily of smaller scale case studies; for example, Hasazi, Gordon, and Roe (1985) and Baer et al. (2003) find that CTE enrollment predicts employment success for former special education students. This line of correlational research is a focus of three recent meta-analyses (Haber et al., 2016; Mazzotti et al., 2016; Test et al., 2009), all of which report that CTE enrollment is predictive of employment success, postsecondary education, or both.

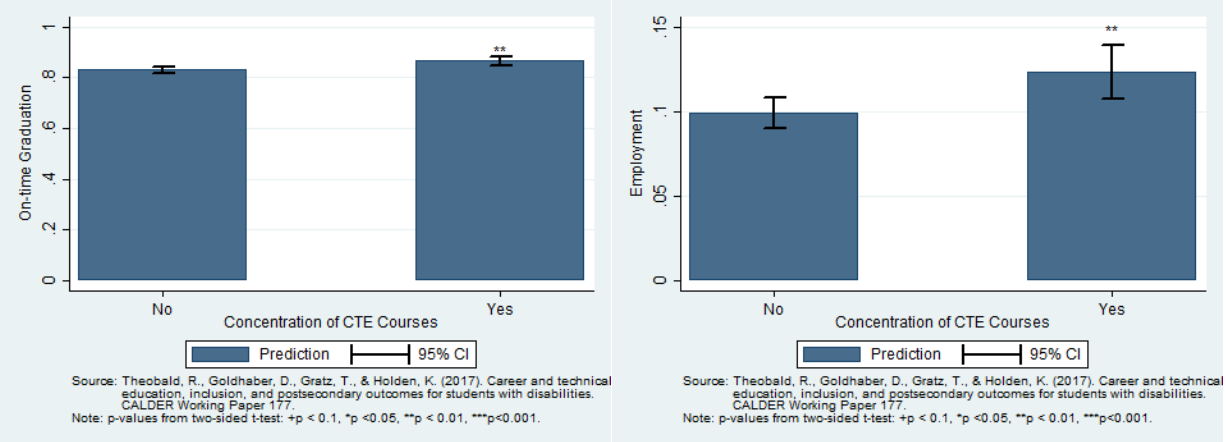
That said, a significant shortcoming of the vast majority of the studies considered in these reviews is that they do not control for important factors like baseline measures of student achievement that may make specific SWD both more likely to participate in CTE and more likely to have better outcomes. In other words, we should probably have a healthy skepticism that these early studies really capture the *causal effects* of CTE participation as opposed to reflecting the *types* of SWD who participate in CTE.

Four recent studies do control for baseline measures of student achievement in assessing the relationship between CTE participation and postsecondary outcomes for SWD. Lee, Rojewski, and Gregg (2016) and Wagner, Newman, and Javitz (2016) both use nationally representative data from the National Longitudinal Transition Study-2 (NLTS2) and find that SWD who enroll in a "concentration" of at least three (Lee et al., 2016) or four (Wagner et al., 2016) credits of CTE courses in high school are more likely to be employed within 2 years of leaving high school than observably similar SWD who enroll in fewer CTE courses in high school.

These results were replicated and extended in a recent CALDER working paper using comprehensive high school data from Washington State (Theobald et al., 2017) and further extended to focus on students with specific learning disabilities in the state (Theobald et al., 2018). These studies find little relationship between CTE participation in any specific grade and postsecondary outcomes for SWD but replicate the Lee, Rojewski, and Gregg (2016) and Wagner, Newman, and Javitz (2016) findings that participation in a

concentration of CTE courses in high school is predictive of both graduation and employment outcomes for SWD. Specifically, as shown in Figure 1, SWD in Washington State who participate in a concentration of CTE courses in high school are about 3.4 percentage points more likely to graduate on time with a regular high school diploma and about 2.5 percentage points more likely to be employed after graduation relative to their peers with disabilities, conditional on observed student characteristics and prior academic performance.

Figure 1. Predicted Probabilities of Graduation and Postsecondary Employment for SWD



In related work, Dougherty, Grindal, and Hehir (2018) use data from Massachusetts to investigate the relationship between CTE participation in high school and the probability that SWD graduate and earn industry-recognized certificates. They find that SWD who participate in CTE are more likely to graduate and earn these certificates than observably similar SWD who do not participate in CTE and that these relationships are particularly strong in the state's regional vocational and technical schools.

Finally, while there is generally little evidence about *specific aspects* of CTE that are predictive of postsecondary outcomes for SWD, one exception is recent work (Gottfried, Bozick, Rose, & Moore, 2016; Plasman & Gottfried, 2018) that considers school-based experiential programs and applied STEM coursework as predictors of longer term outcomes for SWD. Plasman and Gottfried (2018) find that applied STEM courses are predictive of better outcomes for SWD (e.g., lower dropout rates, higher test scores, higher rates of postsecondary enrollment), while Gottfried et al. (2016) report that these aspects of CTE courses are more predictive of progression through the STEM pipeline for students without disabilities than for SWD.

What Is Not Known?

The results discussed above suggest that SWD *may* benefit from taking a concentration of CTE courses in high school for SWD (Lee et al., 2016; Theobald et al., 2017, 2018; Wagner et al., 2016), particularly in CTE-focused technical high schools (Dougherty et al., 2018). However, despite the rigorous statistical controls employed in these papers, it is important to emphasize that there are still good reasons to question whether these descriptive relationships represent *causal* relationships. Specifically, even conditional on baseline measures of academic performance and other observable characteristics, SWD who are more motivated to pursue employment immediately after high school may take more CTE classes or be more likely to enroll in CTE-focused technical high schools than observably similar SWD. If this is the case, then the relationships between CTE participation and postsecondary outcomes for SWD in these

studies could simply reflect the sorting of SWD in CTE classes and schools rather than the causal impact of CTE on these outcomes for SWD.

Moreover, unlike recent experimental evidence about oversubscribed CTE technical schools in Massachusetts (Dougherty, 2018) and career academies in North Carolina (Hemelt et al., 2018)—the focus of a companion CALDER policy brief (Hemelt & Lenard, 2018)—there are currently no studies that experimentally evaluate (either through randomization or natural experiments) the impact of CTE *specifically for SWD*. The consequence is that there is currently no causal evidence linking SWD participation in CTE and their later outcomes. Thus, the most important unknown question in this line of research is whether the extensive correlational evidence documenting the relationships between CTE participation and postsecondary outcomes for SWD supports the conclusion that participation in CTE coursework *leads to* these better outcomes for SWD.

As mentioned in the previous section, there is generally little evidence about specific aspects of CTE programs that are particularly predictive of outcomes for SWD and practically no research that assesses the outcomes of SWD more than 1–2 years after high school. As a prime example, it is not clear whether the relationships between participation in a concentration of CTE courses and postsecondary outcomes for SWD within 2 years of high school (Wagner et al., 2016; Theobald et al., 2017, 2018) are driven by the *number* of CTE courses taken by SWD, the *types* or *teachers* of courses SWD take when they take a concentration of CTE courses, or the *school setting* (e.g., CTE high schools) in which these courses are provided or whether these relationships hold for longer term employment outcomes for SWD. Thus, a promising future direction for research in this area is to connect these different aspects of CTE programs to longer term outcomes for SWD to provide more nuanced evidence for policy makers.

Policy Levers and Policy-Making Challenges

The research discussed above has made CTE a promising policy lever to improve outcomes for SWD, and many states and districts have responded by dramatically increasing CTE offerings for SWD in recent years (Wagner et al., 2016). A consequence of this expansion, though, is that many states are struggling to staff all of their CTE classrooms with certified CTE teachers; for example, 34 states reported shortages of CTE teachers in 2016–17 (U.S. Department of Education, 2016). A common policy response to these shortages has been to introduce alternative paths to CTE teacher licensure; in Washington, for example, CTE teachers are not required to have a bachelor's degree but can instead receive a teaching credential through the state's "Business and Industry route" on the basis of prior employment in fields related to CTE and enrollment in short, 1-year programs that briefly cover the fundamentals of teaching.

Another consequence of CTE teacher shortages is that states often issue dramatically more temporary or emergency teaching licenses in CTE than in other subjects; for example, 59.2% of all teachers who taught a CTE course in the 2015–16 school year in Washington had only a temporary (conditional or probationary) certification, compared to less than 1% of teachers in core academic subjects (author's calculations). Given that teacher educators increasingly advocate that all teachers should receive training on teaching strategies for SWD (Pugach, Blanton, & Florian, 2012; Shepherd et al., 2016), the lack of such training for many CTE teachers in the state *potentially* has implications for SWD, though there is no existing quantitative research investigating this specific issue.

Finally, another common policy response to expand CTE opportunities is to open CTE-focused schools like the regional vocational and technical schools in Massachusetts studied by Dougherty et al. (2018) or the career academies in North Carolina studied by Hemelt et al. (2018). One policy challenge with this

model, though, is ensuring equal access to SWD in these schools; Hemelt et al. (2018), for example, find that SWD are less likely to enroll in North Carolina career academies than other students, though this relationship can be explained by the lower overall academic performance of SWD in the state. In contrast, Dougherty et al. (2018) report that SWD make up nearly 27% of the student body in regional technical schools in Massachusetts (compared to 16% in non-CTE high school settings), which suggests that Massachusetts provides a model of how these technical schools may greatly expand CTE opportunities for SWD.

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