

Certified Skills: Who Earns Industry-Based Certifications in High School, and How do They Shape Students' Postsecondary Education and Employment Outcomes?

Matt Giani, Ph.D.

The University of Texas at Austin

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Executive Summary

Texas, like many states, considers students to be *college, career, or military ready* (CCMR) if they earn an industry-based certification (IBC) in high school. IBCs are credentials conferred by businesses (e.g. Microsoft), industry groups (e.g. the National Center for Construction Education and Research or NCCER), or state certifying entities (e.g. the Texas Department of Licensing and Regulation or TDLR) to individuals who demonstrate a sufficient level of knowledge and skills in a particular domain, often through one or more assessments. While the expansion of opportunities for students to earn IBCs has been stimulated through state policy, such as House Bill 22 (2017), limited research has systematically examined what factors influence students' receipt of IBCs and the relationship between IBCs and students' postsecondary educational and employment outcomes.

The results of this study show that the greatest source of variation in students' receipt of IBCs is across schools, suggesting that school-level approaches to expanding IBCs are particularly critical. IBCs are found to have a positive but modest relationship with students' college enrollment and persistence, nearly no relationship with the likelihood of employment, and large and positive relationships with earnings for many IBC subjects. Importantly, these results are largely consistent across demographic groups, suggesting few inequities in the relationship between IBC receipt and subsequent outcomes. Overall, our results suggest IBCs provide concrete earnings benefits and do not deter students from higher education, but access to IBC opportunities remains highly uneven across the state.

What We Studied

Although Texas began collecting data on students' receipt of IBCs since 2016-17, few studies have analyzed the factors that predict students receipt of IBCs or the relationship between IBC receipt and students' postsecondary education and employment outcomes. To our knowledge, our study is the first statewide examination of these two gaps in the literature.

For decades, one of the most prominent approaches for ensuring students are ready for the labor market is career and technical education (CTE), previously known as vocational education. Historical research often found that CTE programs stratify educational opportunity by race and class,ⁱ reduce students' likelihood of attending college,ⁱⁱ divert students from 4-year to 2-year colleges,ⁱⁱⁱ and transition students into careers with limited opportunities for social mobility.^{iv}

More recent studies have found less evidence of racial and socioeconomic disparities between CTE concentrators and

non-concentrators^{v,vi} and more positive relationships between CTE and students' postsecondary outcomes.^{vii,viii} Combined with the recent passage of the Strengthening Career and Technical Education for the 21st Century Act (Perkins V) in 2018, there has been a resurgence in research, policy activity, and school reform related to CTE in recent years. Nevertheless, questions linger regarding the value of CTE programs and whether trends in the participation and outcomes of CTE students and how they can most effectively facilitate students' transition into postsecondary education and employment.

An increasingly prominent strategy for ensuring CTE programs are developing in students the knowledge and skills aligned with industry needs is to provide students with opportunities to earn industry-recognized certifications (IBCs) in high school. IBCs^{ix} are credentials conferred by businesses (e.g. Microsoft), industry groups (e.g. the National Center for Construction Education and Research or NCCER), or state certifying entities (e.g. the Texas Department of Licensing and Regulation or TDLR) to individuals who demonstrate a sufficient level of knowledge and skills in a particular domain, often through one or more assessments. While many IBCs require a bachelor's (e.g. teaching licenses) or graduate (e.g. medical license) degree, more than half of the states in the US now provide opportunities for students to earn IBCs they are eligible for in high school.^x In 2019 alone, 28 states passed legislation related to IBCs^{xi} and 42 out of 45 states (93%) that responded to a national survey reported that students in their student could earn IBCs during high school.^{xii} The expansion of IBCs can be understood in the context of a growing emphasis on preparing students for careers in addition to college. IBCs are most often earned as students complete career and technical education (CTE) programs of study, but IBCs are earned through an independent assessment and are not conferred simply for completing CTE courses. Despite the recent growth of IBCs in K-12 state policy, little is known about who earns IBCs and how they shape students' college and career trajectories.

Texas is an ideal context for this study due to the prominence of IBCs in state policy.¹ Through House Bill 22 (2017), the Texas Legislature directed the Texas Education Agency (TEA) to factor students' receipt of approved IBCs into the state's public school accountability system and to publish a list of approved IBCs that are *industry recognized* and *valued* by employers that qualify for this purpose.^{xiii} Texas is also a large and diverse state, where the majority of students in the public school system are low-income and more than half are students of color. Given historical concerns about inequity in CTE, it is important to examine how student characteristics are associated with IBC receipt and whether they truly provide an avenue to postsecondary success for historically underrepresented populations. This study addresses the following research questions:

Research Questions

- 1) What are the rates of IBC acquisition across Texas by the educational/occupational area of the IBC?
- 2) What student, school, and geographic factors are most strongly related to students' likelihood of earning an IBC?
- 3) What is the relationship between students' acquisition of IBCs and their postsecondary educational and employment outcomes, and does this relationship vary across demographic groups?
- 4) How do students understand and perceive the value of IBCs?

How We Analyzed the Data

Our analytic sample includes nearly all students who graduated from a public high school in Texas between 2017-2019, totaling more than one million students. We used data on IBC receipt provided by the Texas Education Agency (TEA) to identify which students earned IBC and the specific IBCs they earned. We also categorized students based on the subject of their IBC. Out of the three cohorts, 2.7% earned an IBC in 2017, 4.8% in 2018, and 9.9% in 2019, indicating the rapid growth in IBC receipt and report. Combined, 5.9% (n = 60,727) of the three cohorts earned at least one IBC before graduating.

The first phase of our research explored predictors of IBC receipt. We used multi-level logistic regression models to examine the student and school characteristics most strongly related to students' earning any IBC or IBCs in specific subjects.

¹ Texas uses the term *industry-based certifications (IBCs)*, but we use IBCs for consistency throughout the report.

The second phase of our research explored the association between IBC receipt and students' postsecondary outcomes, including college enrollment and persistence, college major, employment, and earnings. We linked our cohort to college and workforce data contained in the ERC and used linear regression models with school fixed effects to explore these relationships.

What We Discovered

Finding 1: Health Science, Business, and Manufacturing dominate the Top-25 most common IBCs

As shown in Figure 1, Health Science is the most common IBC subject, followed by Business and Manufacturing.

These are the only three CTE subjects in which more than 0.5% of high school graduates earned a certification. IBCs in subjects such as Agriculture, Public Service, Information Technology, Hospitality & Tourism, and Education are quite uncommon. Health Science and Business also dominate the list of the most popular IBCs in Texas.

Finding 2:

Hispanic, Asian, and higher achieving students are most likely to earn IBCs, but schools are the most important factor

Although Hispanic and Asian students had higher IBC rates than Black and White students and economically disadvantaged students had slightly higher IBC rates compared to non-disadvantaged students, demographic factors were not strongly related to IBC receipt. Two factors were far more important. First, higher achieving students were found to be more likely to earn IBCs, though this relationship varied considerably across IBC subjects as reflected in Figure 2. Second, schools explained more than half of the variation in receipt of any IBC and between two-thirds and three-fourths of the

Figure 1: Health Science is the most common IBC subject, and many IBC subjects are uncommon

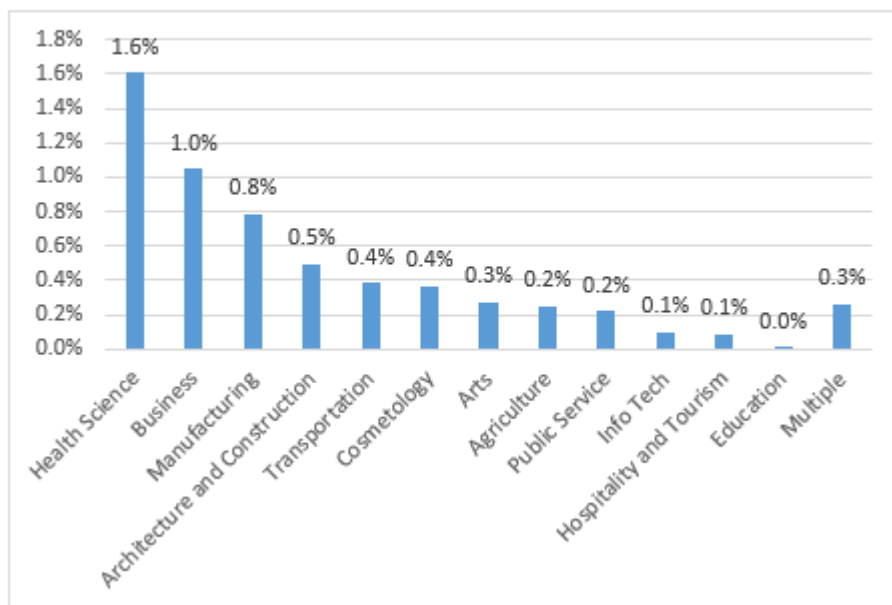
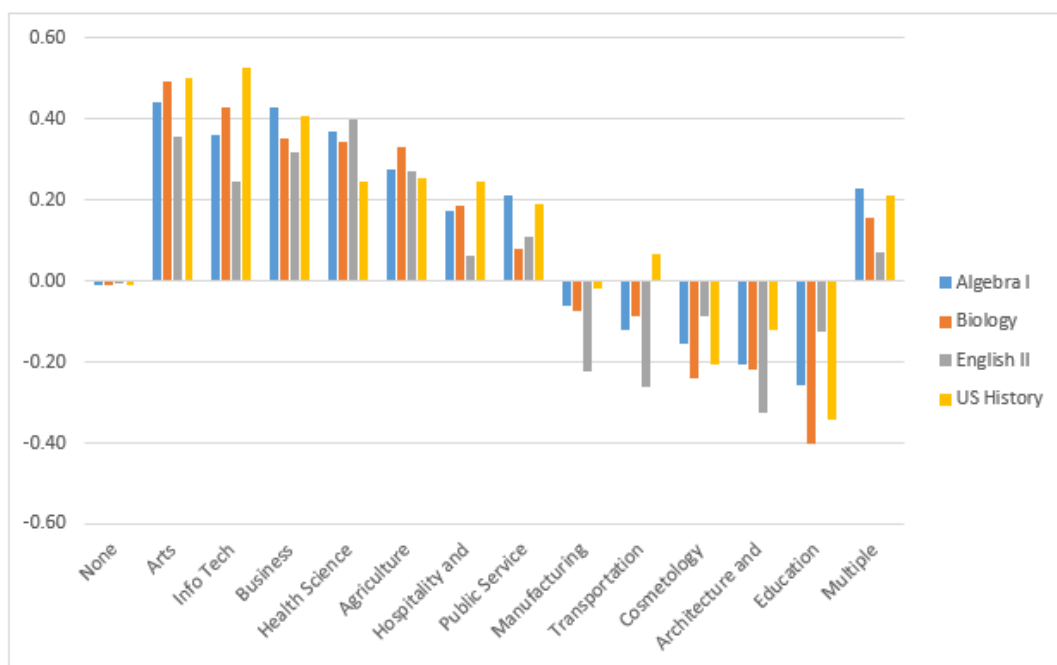


Figure 2: Student achievement varies markedly across IBC subject areas



variance in receipt of IBCs in specific subjects. In comparison, schools tend to explain roughly one-fifth of the variation in standardized test scores.

Finding 3: IBCs in fields like Agriculture, Business, and Health Science are positively associated with college outcomes, but fields like Cosmetology, Manufacturing, and Transportation are negatively associated

Across analyses, we found that earning an IBCs is associated with a 0-1 percentage point increase in college enrollment and a 2-3 percentage point increase in persistence for those who enrolled in college their first year. Although these estimates are not huge, it is a positive finding that IBCs do not deter students from college given that they are more strongly aligned to the labor market. But these relationships also varied considerably across IBC subjects, as shown in Figure 3. Fields such as Agriculture, Business, Health Science, and IT tended to be positively associated with college outcomes, while fields such as Hospitality and Tourism, Cosmetology, Manufacturing, and Transportation were negatively associated.

Figure 3: The Relationship between IBCs and college outcomes varies considerably across IBC subjects

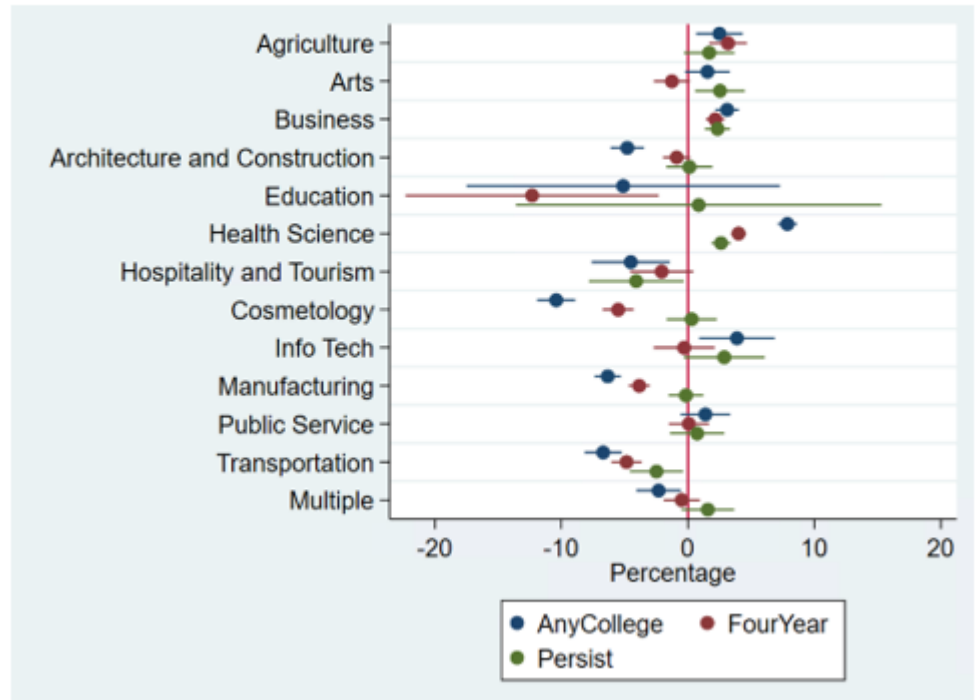
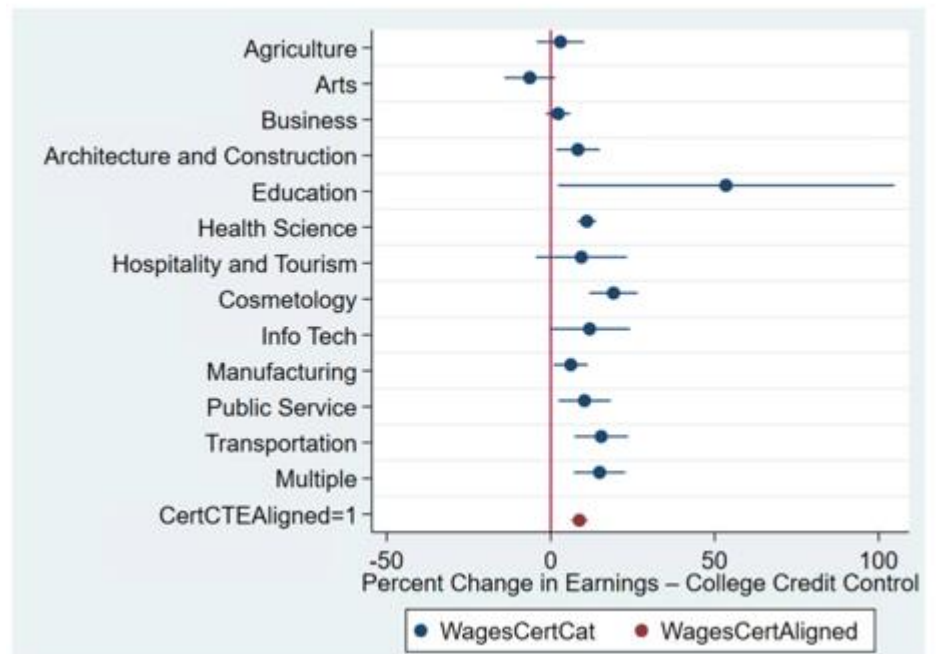


Figure 4: A number of IBCs are positively related to earnings, with cosmetology providing the largest reliable earnings benefit

Finding 4: IBCs are minimally related to employment, but significantly related to earnings for many IBC subjects and all demographic groups

Our statistical models suggest that IBC receipt is marginally related to students' likelihood of employment, if at all. However, we found that the majority of IBCs are positively and significantly related to students' log-earnings, as reflected in Figure 4. Interestingly, many fields that were inversely related to college enrollment, such as Cosmetology and Transportation, are strongly and positively related to earnings. It is also important to note that the relationship between IBC receipt and labor market outcomes is highly consistent across demographic groups.



As reflected in Figure 5, IBC receipt is associated with roughly a 10% increase in first-year earnings, and this estimate varies little across racial/ethnic, gender, and economic groups as well as other populations of students.

Finding 5: The majority of students are not employed in the industry most closely aligned with their IBC

Although our results show that IBC receipt is positively related to first-year earnings, we find only modest evidence that earning an IBC helps students find a job in an aligned industry.

As shown in Figure 6, the majority of workers are employed in either the Accommodation and Food Service or Retail Trade industries for nearly every IBC subject apart from manufacturing. Roughly two-thirds of high school graduates who earned an IBC in Arts and A/V or Hospitality and Tourism are employed in those industries.

Second, there are a handful of IBC areas where students are considerably more likely to be employed in that industry compared to students who did not earn an IBC. These IBC subjects are Agriculture, Architecture and Construction, Cosmetology, Health Science, and Manufacturing.

Third, for the remaining IBC areas, less than 5% of employees are working in an industry aligned with their IBC. IBC subjects such as Arts and A/V, Business, Hospitality and Tourism, Info Tech, Public Service, and Transportation fall in this category.

For all IBC areas, no more than one quarter of employed students are working in an industry aligned with their IBC.

Figure 5: The relationship between IBC receipt and first-year log-earnings is remarkably consistent across demographic groups

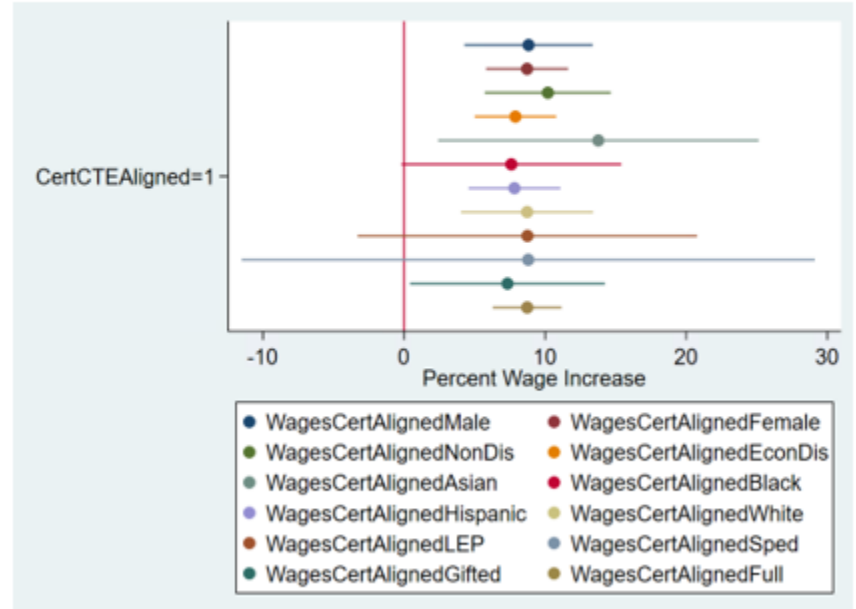
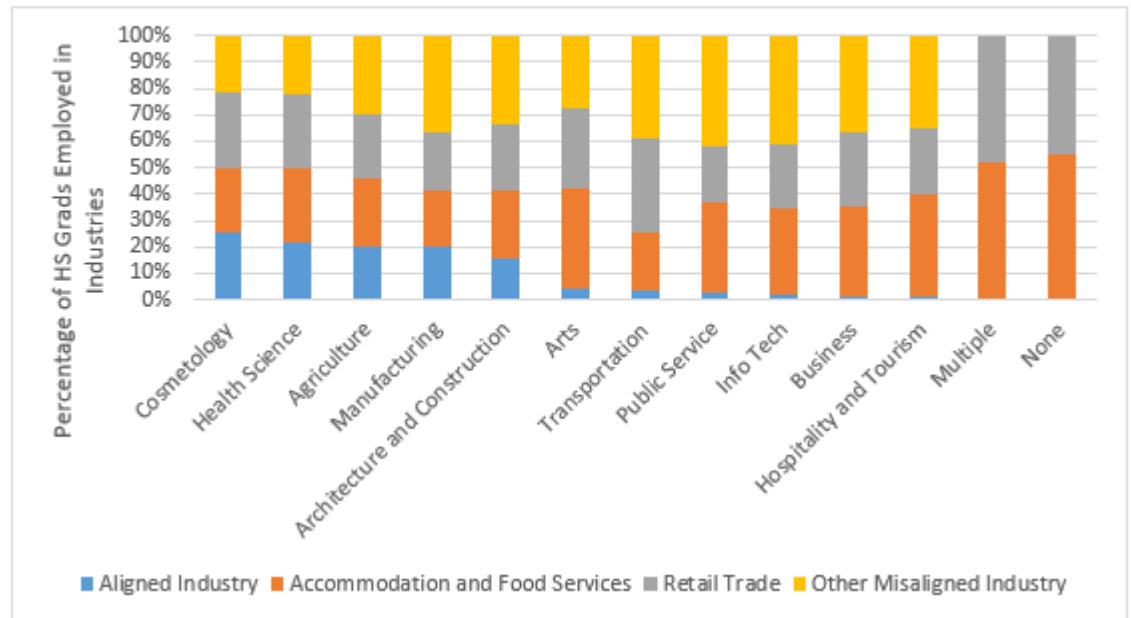


Figure 6: There is a modest relationship between IBC subject and industry of employment, though employment in Food Services and Retail is most common for all IBCs



Discussion/Policy Recommendations

What standards should we use to judge the value of IBCs?

There are nearly one million credentials students can earn in the United States, more than half of which are issued by non-academic providers – digital badges and course completion certificates, licenses, certifications, and apprenticeship programs. Which opportunities should states and school districts make available to students? How strongly should we incentivize students to complete them? How should the completion of these credentials count for high school course credit and graduation requirements? And who should bear the costs? The answers to all of these questions depend on the value of IBCs. If they substantially improve students’ labor market outcomes without deterring students from college, they seem like a surefire return on investment. But as this study shows, IBCs vary considerably in their relationship with both college and labor market outcomes, and they often promote one outcome but not the other. The Cosmetology license is a notable example, significantly improving students’ first-year earnings but negatively related to college-going. If these programs are popular and improve students’ earnings, should we not prioritize them? Without agreed upon standards for judging

What in-school mechanisms explain who earns IBCs, and how can state policy broaden access?

One of the clearest takeaways from this study is that schools matter tremendously in shaping which students earn IBCs, yet school demographic and academic characteristics and specific school reform models showed little correlation with the school’s IBC rate. Schools explained the majority of the variation in students’ likelihood of earning IBCs even when we controlled for the CTE courses students completed, suggesting that schools matter above and beyond the CTE programs they make available to students. Put simply, schools matter but we don’t know why. Future research is needed to examine these in-school mechanisms, and state policy can provide funding and supports to expand students’ access to IBCs.

What is the ideal alignment between the CTE pathways and IBCs students complete during K-12 and postsecondary outcomes?

While some CTE pathways and IBCs are tightly coupled with what students study in college and the industries they eventually work in, many are not. In the era of guided pathways and coherent programs of study, these diverging pathways may be inefficient. Why would states, schools, and students invest in IBCs if they do not plan to continue on that educational and employment pathway in the future? I argue that we should not judge the value of IBCs too strongly by their alignment with students’ future pathways. Exposing students to pathways they decide not to pursue could still be a highly valuable experience. Maybe a little inefficiency is okay when we’re dealing with sixteen-year-olds.

References

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ⁱⁱ Dougherty & Lombardi (2016). *Ibid.*

ⁱⁱⁱ (Cellini, 2006)

^{iv} Hanushek, E. A., Schwerdt, G., Woessmann, L., & Zhang L. (2017). General education, vocational education, and labor-market outcomes over the lifecycle. *Journal of Human Resources*, 52(1), 48-87. doi:10.3368/jhr.52.1.0415-7074R.

^v *Ibid.*

^{vi} Giani, M. S. (2019a). Does vocational still imply tracking? Examining the evolution of career and technical education curricular policy in Texas. *Educational Policy*, 33(7), 1002-1046. doi:10.1177/0895904817745375.

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viii Giani, M. S. (2019b). Who is the modern CTE student? *A descriptive portrait of career and technical education students in Texas*. Washington, DC: American Enterprise Institute. Available from <https://files.eric.ed.gov/fulltext/ED596293.pdf>.

ix The terms industry certifications, industry-based certifications (IBCs), and industry-recognized certifications (IBCs) are equivalent. Different states use different terminology to refer to these certifications.

x Education Commission of the States (2020). *Secondary career and technical education: Does state policy allow students to earn credentials through CTE coursework?* Retrieved from <https://reports.ecs.org/comparisons/secondary-career-and-technical-education-06>.

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xiii For more information about the Texas Education Agency's criteria for adding IBCs to its approved list for accountability purposes, see <https://tea.texas.gov/sites/default/files/ibc-evaluation-faq-updated-timeline-and-criteria.pdf>.

Author Note

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