Credentials in Secondary CTE Programs

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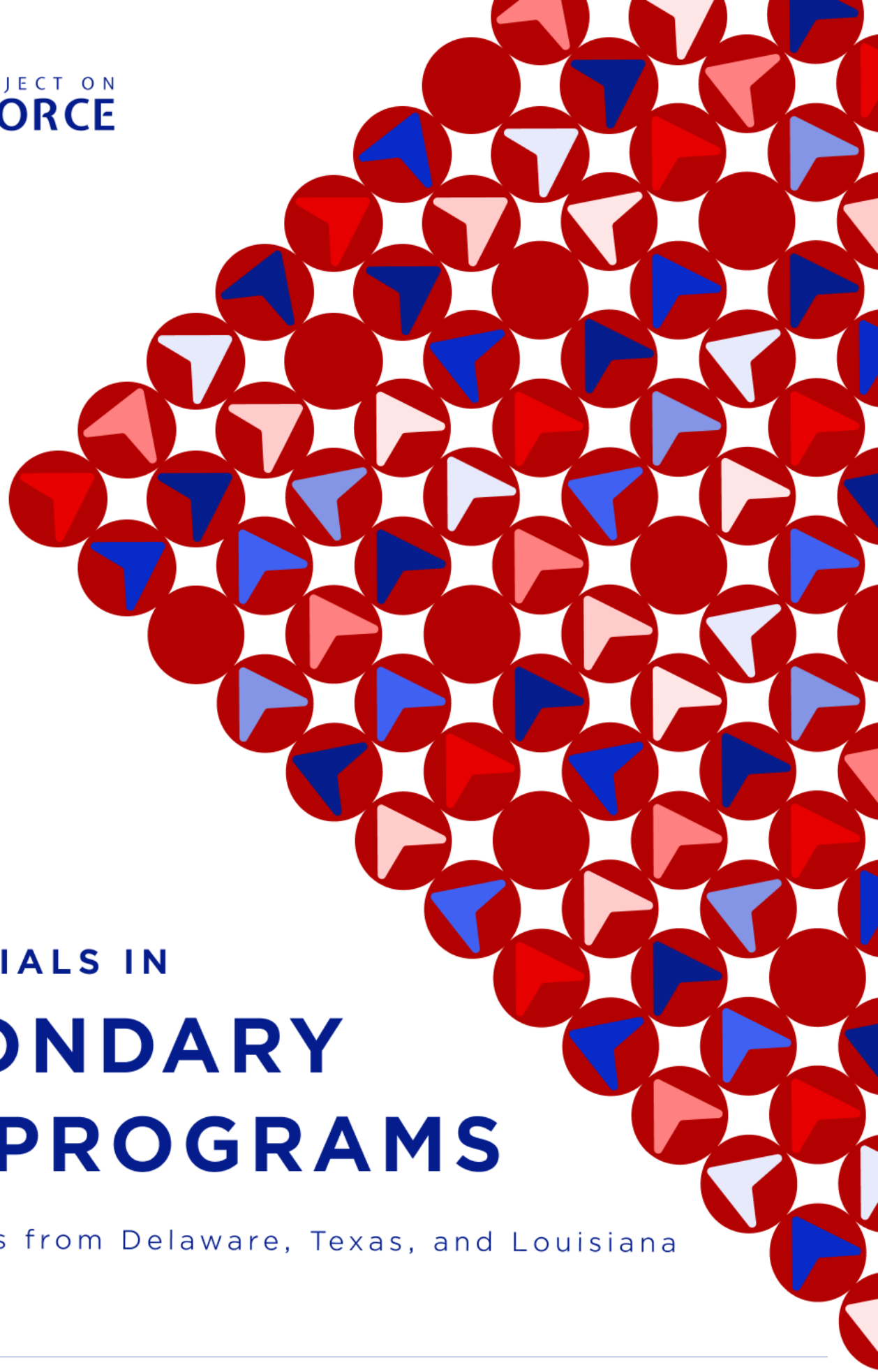https://www.pw.hks.harvard.edu/post/summerfellowsseries#viewer-fl5qi;https://www.pw.hks.harvard.edu/post/credentials-in-secondary-cte-programs

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CREDENTIALS IN

SECONDARY
CTE PROGRAMS

Case studies from Delaware, Texas, and Louisiana

The Project on Workforce at Harvard Summer Fellowship Series

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About the Project on Workforce at Harvard
The Project on Workforce is an interdisciplinary, collaborative project between the Harvard Kennedy School's Malcolm Wiener Center for Social Policy, the Harvard Business School Managing the Future of Work Project, and the Harvard Graduate School of Education. The Project produces and catalyzes basic and applied research at the intersection of education and labor markets for leaders in business, education, and policy. The Project's research aims to help shape a postsecondary system of the future that creates more and better pathways to economic mobility and forges smoother transitions between education and careers. Learn more at www.pw.hks.harvard.edu.

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Executive Summary

The education-to-employment landscape of college and career pathways is complex and varies from state to state. This report outlines the methodology, considerations, and infographics of three career and technical education (CTE) programs that elected to report on Perkins V's 5S1 program quality indicator, which requires programs to report the percentage of CTE concentrators graduating from high school having obtained a recognized postsecondary credential. We conducted deep dive case studies on CTE programs and credential offerings of Delaware, Texas, and Louisiana and have split this report into the following sections:

- **Key terms and definitions**: There are few federal definitions that guide state CTE programs, so we provide working definitions of how we interpreted and operationalized key terms such as "portable" and "stackable."

- **Methodology**: We conducted primary and secondary data collection. We used a rigorous framework to select our case study states and interviewed 42 experts in the field.

- **Data considerations**: We used publicly available data and data from state CTE offices to inform the infographics. Organizations and states use inconsistent definitions and sources, which impact our ability to equitably compare "apples to apples"; we expand on how this influences our findings.

- **Emerging implications**: Credential relevance and labor market demand will experience big shifts in response to the rapidly changing, high tech future of work and the emerging impacts of the COVID-19 pandemic on state and national economies.

Introduction

The education-to-employment landscape of college and career pathways is complex and varies from state to state. To better understand the postsecondary credentials that secondary students have the opportunity to obtain through state career and technical education (CTE) programs, our team conducted deep-dive analyses of three states' CTE programs and credential offerings. For this report, we conducted literature scans and expert interviews to develop case studies on credentials obtained through CTE programs in Delaware, Louisiana, and Texas. Education and workforce experts often discuss CTE offerings on the " career pathway" or "program of study" level; our analyses go one level deeper, to the credential level, to better understand the relationship between industry-recognized credentials, their long-term market value, and their opportunity to provide credential holders with pathways to jobs with livable wages.

In this report, we first provide an overview of key terms and definitions used in the infographics. Second, we outline our methodology for selecting the three states and our expert interview process. Third, we raise several data considerations that frame our findings and nascent issues that are not reflected in the infographics but will impact the CTE landscape in the future. Lastly, we briefly discuss the effects of the COVID-19 pandemic and the future of work on CTE. Appended to this report are the infographics for the three states we chose.

Key Terms and Definitions

All key terms and definitions below are adapted from OCTAE's glossary, unless otherwise specified.

Career and Technical Education (CTE): Courses (at the high school level) and programs (at the postsecondary level) that focus on the skills and knowledge required for specific jobs or fields of work.

Secondary CTE Concentrator: A student served by an eligible recipient who has completed at least two courses in a single career and technical education program or program of study. This means that once a student completes 2 courses in a single CTE program of study, they are counted as a CTE concentrator.

Industry-recognized credential: An industry-recognized credential is either 1) developed and offered by, or endorsed by, a nationally- or regionally-recognized industry association or organization representing a sizeable portion of the industry sector, or 2) a credential that is sought or accepted by companies within the industry sector for purposes of hiring or recruitment, which may include credentials from vendors of certain products. The four types of credentials (i.e., certificates, certifications, degrees, and licenses) capture nuances such as who they are awarded by, renewal requirements, and assessment mechanisms; their distinctions are laid out in further detail in Appendix A.

National Career Clusters® Framework: Developed by Advance CTE, this framework is an "organization tool for CTE programs, curriculum design, and instruction." There are 16 Career Clusters representing 79 Career Pathways. A full list of Advance CTE's Career Clusters and Pathways can be found here.

Portable: When a credential can be transported with few to no barriers across companies, industries, and geographies (e.g., local, regional, national).

Program of study (POS): A coordinated, nonduplicative sequence of academic and technical content at the secondary and postsecondary level that— (A) incorporates challenging State academic standards, including those adopted by a State under section 1111(b)(1) of the Elementary and Secondary Education Act of 1965; (B) addresses both academic and technical knowledge and skills, including employability skills; (C) is aligned with the needs of industries in the economy of the State, region, tribal community, or local area; (D) progresses in specificity (beginning with all aspects of an industry or career cluster and leading to more occupation-specific instruction); (E) has multiple entry and exit points that incorporate credentialing; and (F) culminates in the attainment of a recognized postsecondary credential." In addition to the requirements outlined in Section 3(41) of Perkins V, states sometimes determine their own criteria for what comprises a program of study.

Stackable: When credentials progressively build upon one another, offering multiple entry and exit points, towards more advanced credentials.

The literature finds that there are three key features of stackable credentials. First, the timeframe to earn each credential should be of short duration. Even though degrees can be stacked in principle, and the associate-to-bachelor's pipeline is technically stackable, the very low completion rate for associate degrees suggests that this progression is not made up of short enough credentials that increase the likelihood of completion. Second, each credential should hold labor market value as a standalone entity and add to the learner's earning power in the workforce. Third, the sequences of stacked credentials should form a clear pathway over multiple credentials to the eventual completion of a degree or higher credential without the loss of credits from earlier credentials in the progression.

Recognized postsecondary credential: A credential consisting of an industry recognized certificate or certification, a certificate of completion of an apprenticeship, a license recognized by the State involved or Federal government, or an associate or baccalaureate degree.

Data & Methodology

State Selection

Our scope of work included developing deep-dive analyses of a few state CTE programs that elected to report on the 5S1 program quality indicator, "percentage of CTE concentrators graduating from high school having attained a recognized postsecondary credential". To ensure the states we profiled varied in terms of program implementation, state size, and other key metrics, we developed a set of criteria to guide our secondary data collection and analyses (the criteria were not ranked or weighted):

- Designated performance level for 5S1 and intended growth from FY2021 to FY2024
- Estimated FY20 and FY21 Perkins State Allocation
- Key demand industries

- Geographic region
- Strategic goals
- Student demographics at the secondary levels
- Political party alignment of representatives
- CTE program administration (e.g., State Education Agency, State Board/Agency with oversight of Community College System, standalone CTE Agency, Workforce Development Agency/Board)
- WIOA Combined State Plan

The associated data were collected mainly from the Perkins State Plans and Data Explorer tool, Advance CTE, and the state profiles on the Perkins Collaborative Resource Network. We used the information gathered against the nine criteria above to narrow down a list of 22 states that report on the 5S1 program quality indicator to the final three: Delaware, Louisiana, and Texas.

Expert Interviews

We held interviews with CTE Directors and support staff for each of the three case study states. We also sourced primary, qualitative data from interviews with national organizations that support CTE work, such as Advance CTE, Ed Strategy Group, and Work-Cred. Over the course of six weeks, we conducted a total of 22 meetings with 42 individuals across 18 organizations, departments, and associations that touch the secondary CTE space in some capacity. Each meeting was conducted virtually and lasted 30 minutes to an hour. For a full list of interviewees' organizations, see Appendix B.

Data Considerations

The infographics sourced publicly available data across federal, state, and industry/credentialing body websites and sources. For input on program implementation and funding, we pulled data from state plans, websites, and our qualitative interviews (see page 2 of each infographic for full references). Unsurprisingly, there is a lack of alignment across reporting bodies and analysis tools. Our analyses and data sources for the table on the "Top Five Credentials Secondary Students Obtain" in each state are provided below in Exhibit 1.

Table 1. Considerations and Notes on Infographic Data

Category	Source	Consideration
Top 5 credentials	State CTE offices, Credentials Matter	By "Top 5 Credentials," we mean the top five most frequently obtained credentials by secondary students in the state. For Delaware, we received the top five credentials students obtain from the state CTE office's self-reported top credentials. For Texas and Louisiana, we identified the top 5 credentials from the states' Credentials Matter profiles. It is important to note that Credentials Matter uses aggregate data from state education agencies, so the numbers of credentials reported on the site include those obtained outside of Perkins-funded programs.
Validated by an industry-recognized third party	Credentialing body	The most frequently obtained credentials in the three states were those created by a nationally- or regionally-recognized industry association or credentialing body (e.g., NCCER, National Center for Construction Education & Research) or by an organization representing a sizable portion of the industry sector (e.g., Microsoft).
Stackable toward other credentials	Credentialing body websites and interviews	Determining stackability can be challenging given the three requirements stipulated in the Key Terms and Definitions section. States create helpful pathways and embed credentials and course progression within them, but in secondary CTE pathways, many of the credentials beyond high school are not short-term (e.g., Associate's and Bachelor's degrees), meaning they do not meet the first requirement for stackability. Second, the labor market value of a credential can be uncertain if employers are requesting a certain skill set but not requiring an associated certification. For instance, thousands of job postings mention a requirement for knowledge in Microsoft Office Suite but do not require the Microsoft Office Specialist (MOS) certification. Thus, it is difficult to verify whether the MOS credential holds labor market value on its own. Lastly, some credentials, such as Certified Nursing Assistant, can hypothetically lead to certification as an LPN or RN, but in reality, the gap between these rungs in the ladder are wide and cannot currently be filled with existing options. On the other hand, the certifications offered by NCCER (National Center for Construction Education & Research) are a great example of stackable credentials that meet the three criteria.
Portable across state	State's job postings	Most credentials are portable within a particular state, though, in construction, for example, the value of a certification is generally viewed differently within a state and across operators (Tier 1 cities vs. Tier 3 cities, union vs. nonunion, residential buildings vs. commercial buildings or academic institutions, etc.).
Portable across country	Jobs postings across the country	For many health-related credentials, such as Certified Nursing Assistant and Certified Dental Assistant, states require state-specific credentials, making them not portable across state lines.
Most frequently sought out by industry	Credentials Matter, top 10 "in demand" labor market demand	We interpret "most frequently sought out by industry" as the most in-demand credentials overall based on the quantity of online job postings that include that credential. We used Credentials Matters' state-specific demand as a proxy, and Credentials Matter draws on Burning Glass Technologies data, which scrapes job posting sites for key information. In some industries, such as construction, welding, or automotive repair, however, online job posts might not be the main channel for advertising job openings. Moreover, some job postings might mention a credential but not require it. For these reasons, the checkmarks--or lack thereof--in each column might not accurately represent true credential demand.
In one of Advance CTE's Career Clusters	Advance CTE National Career Clusters Framework	States' programs of study or pathways do not neatly map to Advance CTE's National Career Clusters Framework; we used a heuristic method to organize state credentials and the programs of study they fall under into the framework.
In high-demand career clusters (10-year labor projections; Louisiana's projections are 6 years)	Long-term labor projections issued by state's governing labor/workforce body	The labor categories states use do not neatly map to Advance CTE's National Career Clusters Framework; we used a heuristic method to organize credentials and the programs of study they fall under into each state's labor categories. It is important to note that a credential falling within a high-demand career cluster does not assume the job it likely leads to is also in high demand or provides a livable wage.
In Career Cluster that leads to livable wages	MIT Living Wage Calculator by state, household of 1 adult and 0 children	The MIT Living Wage Calculator organizes labor categories in accordance with the Bureau of Labor Statistics' (BLS) 2018 Standard Occupation Classification System, which does not neatly align with Advance CTE's National Career Clusters Framework. We used a heuristic method to map BLS' labor categories and their typical annual salaries to the Career Clusters. Our bar for livable wages is the required annual income before taxes for 1 adult with 0 children living in the state overall (no particular region or metropolitan area).

Considerations Around Stackability

States sometimes create career pathways that are theoretically stackable but, in practice, offer limited stackability. The Microsoft Office Specialist and Certified Nursing Assistant credentials popular in many states serve as examples of credentials that are not stackable in many of the forms they are implemented.

Microsoft Office Specialist Certification
One state has outlined the following pathway for a track within its Business Management program of study: Microsoft Office Specialist or Expert - Excel (MOS) > Certified Records Manager (CRM) > Associate's degree in Business Administration > Bachelor's degree in Business Administration.[9] According to the Institute of Certified Records Managers, which issues the CRM certification, the MOS certification is not a qualification requirement for the CRM; instead, a minimum of five years of professional records and information management experience is needed if a candidate only has a high school diploma. So a student would obtain the MOS in high school, work for five years, then apply for and complete the CRM. Meanwhile, the student has the option to start an Associate's degree in Business Administration immediately following high school (or earlier, through dual enrollment), but the student's MOS and/or CRM certification might not contribute to credit towards the degree at a local community college. Thus, while this progression is presented as stackable at the state level, according to the features outlined by Bailey and Belfield, these credentials do not meet the definition of stackable.

Certified Nursing Assistant Credential
The Certified Nursing Assistant (CNA) credential can be a rewarding first step into the healthcare field for a graduating high school student. The issue comes when students enter the workforce as CNA's and stay CNA's for their entire career, more often than not earning annual salaries below their states' minimum livable wage threshold (as defined by the MIT Livable Wage Calculator). The CNA credential is valuable when it sits along a pathway of stackable--and by nature, short-term--credentials that allow students to incrementally develop their knowledge and skill sets in increasingly higher levels of nursing and to move up the hierarchy in role and salary (e.g., from CNA to Licensed Practical Nurse to Registered Nurse). Currently, many state-defined career pathways list an Associate's degree in Nursing as the next step for a high school student who has obtained CNA certification. The large gap between the two steps makes progression along the pathway less likely. Some states are coming up with innovative ways of addressing the barriers to advancement for CNA's by creating career ladders, higher skill certifications such as the "CNA2", transitions to acute care settings where salaries might be higher, and model programs of study with intermediary certificates between CNA certification and an Associate's degree in Nursing.[10] While progress is being made, a lot of work still needs to be done on the part of states and credentialing bodies to develop pathways made up of truly stackable credentials that support CNA's in attaining livable wage jobs.

CTE in Delaware

The State of CTE in Delaware: Pathways

In 2015, Delaware rebranded its Career and Technical Education (CTE) program as "Delaware Pathways" and set the ambitious goal of achieving the Delaware Promise: ensuring that 65% of the state's workforce has a college degree or professional certificate by 2025. Delaware Pathways is committed to providing secondary students with opportunities to gain industry-recognized and - relevant credentials that lead to high-wage, high-skill, and in-demand jobs. Delaware's model is unique in that the K-12 system meaningfully and regularly collaborates with the state's higher education systems and department of labor, key labor market associations, local employers, and educators to support students in any career pathway they choose. The state also has a unified plan for Delaware Pathways with shared goals and objectives across agencies and other key partners; they provide regular public updates on their progress against this plan.

Let's Talk Numbers: Demographics and Student Enrollment

29% of enrolled high school public school students grades 9-12 in DE are CTE concentrators.[1]

How DE reports the program quality indicator:

Concentrators who obtain a recognized postsecondary credential[2]

CTE Concentrators[3]

Based on DE's reporting definition, 15% of CTE concentrators have achieved this program quality indicator.[4]

56%
56% of secondary CTE participants in state are students of color [5]

47%
47% of secondary CTE participants in state are female [6]

30%
30% of students come from low socioeconomic backgrounds [7]

80%
80% of Perkins Allocation to Eligible Recipients goes to secondary-level CTE [8]

CTE in Texas

View full infographics at pw.hks.harvard.edu/post/credentials-in-secondary-cte-programs

The State of CTE in Texas

Texas Education Agency's (TEA) CTE programs provide the technical knowledge and skills needed to prepare students for further education and careers in current or emerging professions and to give them a leg up in the job market, regardless of their career pathways of choice. To this end, in 2018, TEA started to reevaluate its list of industry-backed credentials (IBC's) because its existing one was not all-encompassing - it mostly focused on the trades sector and did not include IBC's in every career cluster. As part of the effort, TEA explicitly requested industry stakeholders to recommend IBC's that should be included in the school system. The final list of IBC's and programs of study (POS) was rolled out to all school districts, and in the 2019-20 school year, there were 826,768 secondary CTE concentrators in the state. Going forward, TEA intends to continue monitoring its statewide POS to ensure rigor and quality outcomes--as in in-demand, high-wage occupations--for students.

Let's Talk Numbers: Demographics and Student Enrollment

52% of enrolled public high school students grades 9-12 in TX are CTE concentrators.[1]

How TX reports the program quality indicator:

Students who obtain industry-based credentials, Level 1 or 2 Certificates, an Associate's Degree, or a Bachelor's Degree (P-TECHs)[2]

CTE Concentrators[3]

Based on TX's reporting definition, 8% of CTE concentrators have achieved this program quality indicator.[4]

72% — 72% of secondary CTE participants in state are students of color[5]

48% — 48% of secondary CTE participants in state are female[6]

53% — 53% of CTE learners come from low socioeconomic backgrounds[7]

70% — 70% of Perkins Allocation to Eligible Recipients goes to secondary-level CTE[8]

CTE in Louisiana

The State of CTE in Louisiana: Jump Start

Louisiana believes in the strength and potential of its career and technical education, creating opportunities and pathways for students through Jump Start. Having recently implemented a significant rebranding effort, this southern state tasked a committee with elevating options for students seeking reliable, upwardly-mobile careers. Their coordinated effort has led to the creation of the Workforce Investment Council (WIC), which is comprised of representatives from organized labor, apprenticeship, business and industry education, higher and secondary education, economic development, legislative departments, construction, retail, healthcare, transportation, IT and Louisiana's own CTE administrators. Additionally, the career pathways students select have the potential to develop into stable, lucrative, and in-demand jobs, setting students up for a successful future with further routes into education or career advancement, according to students' preferences.

Let's Talk Numbers: Demographics and Student Enrollment

How LA reports the program quality indicator:

Concentrators who obtain a recognized postsecondary credential / CTE Concentrators

58% of high school students in LA are CTE concentrators.[1]

Based on LA's reporting definition, 30% of CTE concentrators contribute to this program quality indicator.[2]

53%
53% of secondary CTE participants in state are students of color [3]
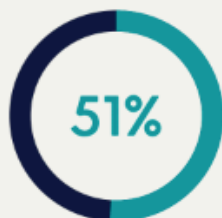
51%
51% of secondary CTE participants in state are female [4]

71%
71% of students come from low socioeconomic backgrounds [5]

56%
56% of Perkins Allocation to Eligible Recipients goes to secondary-level CTE [6]

Emerging Implications

Impact of COVID-19 Pandemic

Due to discrepancies in data collection, curricular administration and inconsistent school schedules, the COVID-19 pandemic will undoubtedly influence the quality, reliability, and even availability of student-level data. Every state and school district anticipates or is currently experiencing these issues, which will continue to influence their CTE program data and results for years to come. Inevitably, CTE administrators will need to report on whatever information they are able to gather and assess throughout the COVID-19 pandemic and compare it to pre-pandemic data. This comprehensive process will remain part of the data landscape for quite some time, making it necessary to add caveats to findings with data limitations. Since the situation is dynamic and still developing, it is difficult to determine whether states will have accurate and comprehensive data in the foreseeable future, largely due to this unique situation. And once they do, they and OCTAE will need to assess any information with caution and extrapolate based on the uniqueness of this situation that the pandemic engendered.

Future of Work

Another key item state and national leaders will need to consider is how the rapidly-changing, high tech future of work will impact the relevance of postsecondary credentials offered to secondary CTE participants. Although technology's impact on labor has already been well underway since the emergence of robust data systems and artificial intelligence, the COVID-19 pandemic expedited its urgency and impact on industry demands. For example, in the welding industry, which recognizes historically-offered welding credentials, advancements in artificial intelligence, machine learning, and automation have changed welding labor market demand. A recent conversation with a welding training provider illuminated decreasing demand for welders as new machines automate many of the responsibilities previously assumed by these workers. While demand for welders is decreasing, the need for welding inspectors to review machine operations is increasing. Nevertheless, welding credentialing bodies have not yet revised their requirements and programs, which means that learners may obtain a credential we already know has limited employment value in the labor market. This results in secondary graduates holding credentials with already-decreasing marketing relevance. To combat this loss of credential relevance in rapidly-changing industries, states will need to establish policies that regularly evaluate, and re-evaluate, CTE credential offerings to ensure each one maps to current and projected, not historical, labor market demands.

Conclusion

This report summarizes our deep-dive analysis into the top credentials secondary students obtain through CTE programs in Delaware, Louisiana, and Texas. We have laid out a glossary of key terms, our methodology for gathering primary and secondary data, important considerations and caveats of the data synthesized for the infographics, and the implications of the COVID-19 pandemic and the future of work on CTE programs, data governance, and student outcomes. The additional commentary around emerging external factors, such as automation, helps to demonstrate the ever-changing nature of this work and highlight the importance of data integration from K-12 to the workforce and of regularly analyzing credentials for quality. Our findings from the qualitative and quantitative research are summarized in a condensed, user-friendly visualization for each deep-dive state.

Bringing these components together is crucial for understanding an incredibly complicated subject whose surface we barely scraped. Ultimately, the reader is given some latitude to choose their own adventure, so to speak, with regard to browsing other resources, some of which can be found in the "Suggested Reading" sections of each infographic, or to interpreting our reasoning.

What readers must remember is that this informa-

tion provides a snapshot of what this moment in time represents and that states are constantly evaluating and updating their programs, despite limited resources, in order to best serve their student populations. Looking ahead, our team eagerly anticipates the emerging developments at the local-, state- and federal-level--particularly with regard to credential offerings, CTE programs, and data governance decisions--that will, hopefully, positively impact career-connected learning for all students.

Appendix

Appendix A. Distinctions Between Credential Types.

Exhibit A. *Four Types of Credentials - Certificate, Certification, Degree, and License* has been reproduced from [WorkCred](#), and lays out the differences between the four types of credentials.

	CERTIFICATE*	**CERTIFICATION**	**DEGREE**	**LICENSE**
Awarded by	Education and training providers, employers, labor unions, and industry associations	Industry certification bodies	Education institutions	Government agencies
Awarded for	An exam at the end of a training or education course or a one-time assessment	Third-party, independent competency assessment	Course of study	Meeting requirements of an occupation
Indicates	Education/knowledge/skills	Skill mastery/competencies	Education, successfully passed courses	Legal permission
Time to complete	Variable, generally less than 2 years	Variable	Variable, generally 2 years or more	Variable
Time and renewal requirements	Often no time limit, no renewal requirement	Time-limited, includes recertification	No time limit, no renewal requirement	Time-limited, renewal generally required
Revocation process	Cannot be revoked	Can be revoked for incompetence or unethical behavior	Cannot be revoked	Can be revoked for incompetence or unethical behavior
Examples	CNC Machinist, Zurich Insurance Apprenticeship	CompTIA Cybersecurity Analyst, Certified Energy Auditor, Medical Laboratory Scientist, MLS(ASCP)^{CM}	Bachelor of Science in Engineering, Associate of Arts in Business Administration	Electrician, Professional Engineer, Registered Nurse

Source: WorkCred, https://workcred.org/Documents/How-Do-Credentials-Differ-image.pdf

Appendix B. Organizations of Expert Interviewees.

Exhibit B. *Organizations of Expert Interviewees*

Entity	Organizations
Delaware	• Delaware Department of Education, Office of Career and Technical Education • Delaware Associated Builders and Contractors • Delaware Restaurant Association
Louisiana	• Louisiana Department of Education, Louisiana Believes • Louisiana Workforce Investment Council • Louisiana's Community and Technical Colleges
Texas	• Texas Education Agency • Houston Community College • Texas Tri-Agency Commission
Other states and local entities	• Washington Office of Superintendent of Public Instruction, Career and Technical Education • Greater Boston Plumbing Contractors Association
Federal	• U.S. Department of Education, Office of Career, Technical, and Adult Education
National Champions Credential Quality	• EQOS • WorkCred • Ed Strategy Group
National Champions in Credential Data Transparency	• Credential Engine • Burning Glass • CareerTech/Advance CTE

End Notes

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6   Center for Occupational Research and Development. (2021, January). *Introduction to Stackable Credentials.*

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