

REFORM ON EDUCATIONAL POLICY: THE ALIGNMENT OF CAREER
AND TECHNICAL EDUCATION PROGRAMS OF STUDY
TO LOCAL LABOR MARKETS

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Do federal policies influence program offerings for career and technical education(CTE)? Often the implication of compliance and the expectation of connecting compliance to funding is considered a tactic to leverage expectations on a large scale. The purpose of this quantitative study was to determine if the CTE programs located in a singular region of Texas were compliant with federal expectations by way of evaluating the alignment of programs offered and local labor markets prior to the implementation of Perkins V. The evaluation of a variety of archival data and subsequent findings of the correlation of alignment of programs within the region along with the amount of federal Perkins's dollars spent on CTE was confirmed as an effective policy reform measure. Additional evaluations included the combination of federal and state spending in correlation to the number of programs offered in career and technical education along with the actual CTE student enrollment of a given district. Major findings showed that through a moderation analysis for some districts the number of programs offered could be influenced by program funding and size. In addition, this study confirmed that many programs are indeed compliant, however compliance does not guarantee program opportunities when resources and enrollment are abundant. Recommendations for future studies concerning administrative decisions for programming and compliance are discussed.

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By

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CHAPTER 1

INTRODUCTION

Public education had long been lauded as the foundation of our democracy, the constructor of our political structure, the designer of class formations, and the solution provider to social ailments. Designers of public policy have looked to public education reform as the cornerstone for ensuring social capital and student achievement in 21st century public schools. The achievement of public education in a local community previously served as a qualitative experience but has evolved into a more data-driven expectation. The argument of labor as a commodity or educational outcome as it related to public education established a long-standing conflicting history. Fragmentation of programs and training, whether in public schools or postsecondary institutions, has created a national focus on the connection between work and learning (Carnevale et al., 2015). As a function of this reform, which included addressing the woefully inadequate counseling systems as well as curriculum and training for the world of work, career and technical education (CTE) reform has been focused on activities that assisted students in making informed decisions with comprehensive understanding about the pathway from learning to earning. The focus of this most recent form was aligning regional programs of study offerings in CTE to a community's local labor market.

The politics of education reform and its influence on a community's capacity for workplace success has been historically patterned around access to livable-wage employment. These reforms centered on community organizing, civic and professional engagement, program quality, and/or the influence of leadership on a community's social capital (Gold, Simon, Mundell & Brown, 2004). No matter the difference in social values within a community, the overall priorities of the community must come with a local commitment for student achievement,

while aspiring for access to economic resources. Exchanging labor for wages remained necessary for increasing access to financial resources, and for those who did not have resources, life quality could be fragile (Katz, 2015). As such, ensuring access to education that promulgates opportunities for technical skill attainment and high academic rigor surfaced once again as the local priorities for highly trained employees became a national outcry by the fall of 2016. In every corner of the United States, where jobs and expansion were prevalent a shortage of talent was also in abundance (Carnevale, 2020).

After the reissuance of the Strengthening Career and Technical Education for the 21st Century Act (Perkins V) sponsored and introduced by Representative Glenn Thompson of the 15 116th-117th districts on May 4, 2017, the necessity for preparing learners for current and future workforces and economic needs shifted the focus more myopically to secondary and postsecondary institutions, with particular emphasis on program quality, access, alignment, and overall accountability. The newest evidence-based approach designed within the Perkins V federal legislation required local communities to help drive a strategic plan across the local education spectrum alongside business and industry while developing student opportunities for transitioning to the world of work (Imperatone, 2020; TWIC, 2017).

Statement of the Problem

Workforce systems have varied greatly across local communities throughout the country. To align secondary education with labor market demands, the federal government has taken additional steps to address workforce system quality, quantity, and effectiveness through updated legislation that requires secondary and postsecondary education to deepen their alignment to each other and local labor markets. The first step for a secondary school to receive funding was to conduct a comprehensive local needs assessment. In the spring of 2020, Texas officials

required needs assessments, conducted by individual school systems, to assess their current alignment with local labor market indexes. The future of work versus the future of workers was an important consideration in today's economy "at a time when education has never been more important to economic success" (Hoffman & Schwartz, 2017 p. 3). Although the unemployment rate for Texas sat at 3.5% in January 2020 and 325,000 jobs were created in 2019, the availability of skilled and talented labor was still limited (Texas Workforce Commission, 2020). The robust local economy of Texas was supported by affordable housing, availability of land, a limited regulatory environment, and a lack of state income tax (Sijk, 2019).

Even with record low unemployment there was still a large contingency of unemployed or underemployed workers and employers who reported the lowest number of qualified candidates to recruit. According to research economists at the Federal Reserve Bank of Dallas, the Texas labor market has become exceptionally tight over the past year. A tight labor market limited companies' ability to grow due to increased difficulty in finding and retaining workers while labor costs increased (TWIC, 2019). Overwhelmingly, the gap between new jobs created and an experienced skilled workforce has grown wider (Gordon, 2013). This phenomenon was often referred to as the "skills gap" and the literature demonstrated varying degrees of labeling such phenomenon. All U.S. workers were classified into standard occupational classification (SOC) codes. The U.S. Department of Labor collected data on the skills needed for each of these occupations. Continually throughout the labor market research, the number of occupations with specific skills has outweighed the number of workers available.

A high school education four decades ago could provide a middle class earning for most high school graduates, but by the fall 2019 most entry-level careers required a more diverse mix of postsecondary education and superior work experiences in a specialized program of study.

According to Carnevale et al. (2017), since 1980, the cost of postsecondary training has grown by 19 times. In 2010, there were more than 2,200 postsecondary programs of study and more than 800 distinct careers. By 2014, there were 4,720 colleges and universities in the United States. During this time, finding clarity amongst the noise for training and workforce was difficult and aligning opportunities within a community for working and learning was not always a shared responsibility among educators and employers (Carnevale et al., 2017).

To address the gaps between workforce and education, research has showed that a more focused and local approach was beneficial. Recent reform within the federal accountability system called for CTE to develop a system of alignment by way of the Perkins V in the summer of 2018. CTE programs were designed to combine strong academic attainment, technical skills, and job-related experiences (Perna, 2018). Students were equipped with the knowledge and skills necessary to get and keep a good job while aligning program opportunities with local workforce needs. The concept and function of workforce development had been around for ages; however, at this crucial time, new developments and forecasting of the workforce were essential. The changes were necessary to close the skills and equity gaps “that received increasing attention among national organizations concerned about education and workforce development” (Hoffman & Schwartz, 2017, p. 3). CTE was once again being viewed as a bridge from secondary education to the world of work by way of technical training, counseling to additional postsecondary opportunities, or both.

Up to this point, research for CTE program alignment and instruction was minimal and lacked reporting for strategic development of future programs. Historical perceptions of CTE programs hindered the work of alignment across the educational and workforce systems (Perna, 2018; Sijk, 2019). After new federal legislation, many states were engaging in conversations

with business and industry, and these resulting conversations produced a growing need for local CTE programs to evaluate the processes in place for reviewing workforce and economic data to determine effectiveness and impact of program offerings on a regular basis (Colorado, 2019). From 2017-2018, Texas received more than \$93 million in Perkins grants with 70% of that funding going to secondary schools and 30% going to postsecondary programs. Although the Texas Workforce Investment Council saw CTE as a critical component for workforce development, there was no consistent available data concerning program alignment and local labor markets (Texas Workforce Investment Council, 2018).

In 2018, the Texas Workforce Investment Council advocated to remove barriers around the inconsistencies of state CTE program alignment and local labor markets. An alignment between the Texas Education Agency, the Texas Higher Education Coordinating Board, and the Texas Workforce Commission sought to do just that beginning in fall 2018. The preparation of a regional understanding for the programs of study available for a region through secondary and postsecondary education as aligned with labor market indexes was not a new concept, however, this was a new step in the most recent state strategic plan (Gordon, 2013, Joseph & Canney, 2019; TWIC, 2019).

Texas' CTE curriculum included technical skills-based instruction utilizing the most recent technologies for respective programs. However, it was unknown if students receiving the training and certifications in these programs were meeting the needs of employers. Having employees capable of adapting and meeting the job skill demand of today's industry needs had not been quantified as it related to secondary programs in Texas (TWIC, 2019). The Texas Workforce Investment Council's strategic plan sought to improve employment transitions by aligning programs and ensuring transferability of skills and credentials between secondary and

postsecondary institutions along with employers. In doing so, it was thought that Texas employers could be better positioned to hire the talent they needed, when they needed it, through a statewide aligned system (TWIC, 2019). It was estimated that this alignment at both the local and state level would deepen trust and create a culture of collaboration. This estimation assumed that CTE programs were not in alignment with their current local community of work. The assumption was not baseless, as in the state of Texas there was a severe lack of data or reporting that provided evidence of alignment (Carnevale et al., 2015; Hyslop, 2018; Rosen et al., 2018; TEA, 2018; TWIC, 2016, 2018, 2019).

Theoretical Framework

This study used the economics of collective action theory to study the behavior of individual school districts in a region and their program offerings as they aligned to state and local labor market indexes. Mancur Olson (1965, 1982, 2000) theorized that the institutional economics of an organization was what stimulated people to act, and the incentivization of an organization was rooted in personal gain. Program offerings were part of selective incentives from monetary to public affirmation. The selective incentives attached to offering a program of study that aligned with labor market indexes was Perkins V grant money. Secondary selective incentives for offering programs were greater business and industry participation and the reciprocity that came from that relationship. There were several distinct organizations that provided influence on this collective action theory. The federal government and state governments were focused on economic development to keep finances and talent at home, while competing in globalized markets. All businesses and industries had an interest in possessing an abundance of skilled talent, and yet each individual business was focused on their own talent pool. Finally, local public schools existed to produce successful graduates who could obtain

gainful employment. Nevertheless, each local education agency had the autonomy to declare the type of training provided for students alongside the fiscal and human capital investment for each program.

It could have been assumed that the collective common interest between governmental policy, business and industry, and the local education agency was a talented workforce that required less upskilling and retraining as the common commodity. However, as Olson (1965, 1982, 2000) described, although each member of this group had a desire for the outcome of a talented workforce, none of them had a desire to pay for this commodity. Every entity in this group placed a different value or expectation on a program of study as it pertained to labor market alignment. Economic forces and strong lobbying encouraged the policy change that held an assumption that federal, state, and locally funded CTE programs would increase the output of a skilled workforce as it pertained to a local labor market and increased the accountability of reporting outputs for program effectiveness.

Purpose of the Study

The purpose of this quantitative study was to determine if the CTE programs located in the 16 counties that make up the north central Texas area, which served more than 364,000 students, were aligned with local labor market needs prior to Perkins V full implementation in the school year 2020-2021. The intent of this study was to evaluate the program alignment around regional and state programs of study in CTE for Texas as they aligned to Workforce Development Area (WDA) 4, 5, and 6 labor market indexes in fall 2019, and to confirm any correlation between federal and state funding amounts with a local education agency's program of study alignment. The study in its totality added to the body of work around educational policy as it pertains to CTE, Perkins V effectiveness, prior accountability, and fiduciary alignment.

Research Questions

The following research questions concerning CTE programs in north central Texas were used to guide the study:

Q1: To what extent are career and technical education programs offered in secondary schools in north central Texas aligned with current labor market needs?

Q2: Does a school district that receives a larger concentration of Perkins grant funding per capita have a greater propensity for program of study alignment to local labor markets?

Q3: Is there a correlation between state and federal spending for career and technical education of a particular local education agency and program alignment with current labor market data based on district National Center for Educational Statistics and TEA classification?

Overview of the Method

For this study, a large variety of archival data were examined to answer the initial binary question around existing CTE programs of study offerings and their current alignment to high-wage/high-demand labor market opportunities in the north central Texas region. The next step required compilation of secondary data to examine the number of programs of study offered by an individual local education agency that were aligned to local labor markets as a dependent variable and the amount of federal and state funding alongside school district size categorization as independent variables.

To begin this analysis, archival data was pulled from Texas Education Agency public websites, individual state reports from official websites with the department of CTE at Region XI Education Service Center and TEA, public Comprehensive Annual Financial Reports (CAFR) for each local education agency, and the CTE spending reports for each LEA in the north central Texas area which met the designed criterion. For the final stage of this study involved a

regression analysis in SPSS with no returned errors to plot the correlation between federal funding and the number of aligned programs of study offered. This required an analysis of the combined state and federal funding alongside the institutional size categories and number of programs of study offered. To create a moderation analysis, substitution of the institutional size categories relied on the CTE enrollment of each institution. Each of these analyses provided answers to questions surrounding funding and program alignment as it pertained to CTE in north central Texas.

Rationale for the Study

Research focused on correlation versus causation was minimal when looking at CTE programs, with a vast majority of researchers focusing on postsecondary programs of study, although most of the federal spending for the Perkins V Act was focused on secondary public education. The literature around programs and labor were vast in separation, however studies around their regional alignment or effectiveness was minimal and varied. Workforce information and education still had very distinct and separate lives within the research community, with inefficient policies that continually promulgated silos and separation (Carnevale et al., 2015). This study sought to address the gap in literature where education and labor overlapped as it pertained to the overall secondary CTE programs (Rosen, et al., 2018). By conducting a quantitative study to identify the concentration of a region's programs of study and local labor market alignment and identify any correlation around program expenditures or institutional size, this study added to the body of literature for CTE. These findings informed a variety of stakeholders, including state and federal policy makers alongside local business and education agencies around the collective action of the education to workforce system and its capacity for change through policy or financial commitment.

Significance of the Study

Although new CTE programs have continued to emerge while innovation and partnership developed with employers and secondary education, the evidence to support the continued revival of and reliance on secondary CTE programs lagged (Rosen, et al., 2018). This study sought to:

- Determine the extent to which local education agencies were already aligning training in CTE with high-wage/high-demand jobs in a local labor market.
- Ascertain the impact of funding and/or school National Center for Education Statistics and TEA Designation as well as CTE student enrollment on program offerings and their alignment to local labor markets.

The purpose of this study was to determine if a correlation could be quantified between federal and state spending and program alignment to a local labor market in order to inform policy makers around expected outcomes. In addition, this study examined educational reform in the way of rewriting already existing policy expectations and its effect on program alignment. The study's findings contributed to the current research on the relationship between secondary education and workforce, the impact of CTE programs in providing adequate opportunities to high-wage/high-demand career training, and equitable access to programming that promoted economic mobility for secondary students.

Delimitations

The primary limitation of this study was in the transition of the Texas state plan for Perkins IV and Perkins V, which established condensed programs of studies and did not fully align data prior to 2019. In addition, the definition of a program completer had migrated from a CTE concentrator where students completed two or more courses for three or more credits within a program. Subsequent data collection in Texas had been a limiting factor and was part of the prompting of a difficult overhaul of all data collection through PEIMS reporting of CTE in Texas

(Texas state plan D). This study relied on the labor market index data generated through workforce development area in Regions 4, 5, and 6.

However, during the development of this study, no one could have imagined the COVID-19 pandemic and eventual shutdown of nearly the entire global economy. The economic engine of Texas and the massive growth that was taking place along with projects of future growth came to a halt in March 2020. Schools' systems were closed to face-to-face training and businesses were leveled unless they carried the moniker of "essential." Texas Governor Greg Abbott declared a state of disaster on March 13, 2020, and until April 30, 2020, the state of Texas was essentially shut down while millions of Texans filed for unemployment and sought small business relief. This worldwide pandemic was the single largest limitation to real time opportunity data for this study and required all job market data and student programing reporting to be limited to a single period prior to the COVID-19 pandemic. Historically, all reporting for funding in the state of Texas for a current fiscal year took place in the October Fall Snapshot for the Texas Education Agency. All data were verified and confirmed for accuracy on January 26, 2020. The data derived for January 2020 in both labor market index and Texas Education Agency reporting were used for this study as it pertained to fall 2019.

Additional delimitations included a singular evaluation of labor needs for an industry as it related to skilled workers and current jobs. For this study, the individual hiring practices of a business or industry or its valuation of an industry-based credential were not evaluated. The complex system of program training for workforce development was examined solely through the lens of secondary education as it aligned with the Texas Education Agency career and technical education programs and the Perkins V Act. The full scope of the Texas Workforce System, including dislocated workers, adult services, the juvenile justice system, and youth

training programs, was not included.

Assumptions

First, the focus of this study was on CTE program capacity offerings for secondary students in the 16 counties that made up north central Texas and did not include the technical programs aligned with postsecondary institutions throughout the same region. Nor did it include any charter schools currently receiving CTE funding as part of the body of research.

For this study, it was assumed that all programs, facilities, and instruction met the minimum expectations of the Texas Education Agency as defined by a program of study through Perkins V and the Texas Essential Knowledge and Skills (TEKS) curriculum standards. In addition, it was assumed TEKS met the needs of business and industry by way of technical training, content knowledge, and industry-based certifications. Next, it was assumed that the definition of a federal program CTE completer would be completion of three or more courses for four or more credits. This change worked to ensure students were provided an acceptable level of skill training for successful employment in each occupational field.

Finally, it was assumed all CTE programming was aligned with industry labor market needs for credentialing within an industry along with a quality program reflective of the community. This assumption included training as defined in work-based learning opportunities as an additive to classroom training. This assumption was a provision of the Carl D. Perkins Act V which was reauthorized in 2018 by President Donald Trump. A program of study linked secondary and postsecondary institutions through the development of academic and technical skill attainment (Perkins V, 2019).

Definition of Key Terms

- *Comprehensive Annual Financial Compliance Report (CAFR)* also known as AFR

Annual Financial Compliance Report (TEA submissions): Each school district in Texas was required to prepare and distribute an annual financial management report that becomes public. This report described the district’s financial management performance and was certified by an independent auditor annually who was a certified public accountant (TEC, §39.083).

- *Comprehensive local needs assessment (CLNA)*: Process for districts to take an in-depth look at their entire CTE system and identify areas where targeted improvements could lead to increased opportunities and outcomes for student success (Texas Education Agency, 2019).

- *CTE completer*: A student completing and passing three or more high-school CTE courses as defined by 19 TAC Chapter 126 (C) 127 (B), or 130 for 4 or more credits within a program of study, including one level 3 or level 4 course from within the same program of study (Texas Education Agency, 2019)

- *CTE concentrator*: A student completing and passing two or more high school CTE courses as defined by 19 TAC Chapter 126 ©, 127 (B), or 130 for at least 2 credits within the same program of study and not a Completer (Texas Education Agency, 2019).

- *CTE explorers*: A student completing and passing two or more high-school CTE courses as defined by 19 TAC Chapter 126 ©, 127 (B), or 130 for at least 2 credits, not within the same program of study, and not a participant, concentrator, or completer (TEA, 2020).

- *CTE participant*: A student completing one but not two or more high-school CTE courses as defined by 19 TAC Chapter 126 ©, 127 (B), or 130 for two or more credits (the student did not have to pass or receive credit) (Texas Education Agency, 2019).

- *Economically marginalized*: For the purpose of this paper, Paul Gorski’s definition of economically marginalized was adopted in place of economically disadvantaged or low-socio economic. The definition was a “financial condition [in] which a family could not afford the

basic human necessities such as food, clothing, housing, healthcare, childcare, and education. This term emphasized that poverty was a form of marginalization, the results of a series of conditions that deny some people access to resources” (Gorski, 2018, p. 7-8).

- *Education Service Center (ESC)*: Established by way of the Texas Legislature in 1967, ESCs were service organizations, not regulatory arms of the Texas Education Agency, and participation by schools in services of the center was voluntary (Texas Education Agency, 2019).

- *Financial Accountability System Resource Guide (FASRG)*: Described the rules of financial accounting for school districts, charter schools, and education service centers (TEA, 2019).

- *Independent town district (67 Texas districts)*: A district was classified as an independent town if: (a) it did not meet the criteria for classification in any of the previous subcategories; (b) it was located in a county with a population of 25,000 to 99,999; and (c) its enrollment was the largest in the county or at least 75% of the largest district enrollment in the county (Texas Education Agency, 2020)

- *Industry-based certifications (IBC)*: Statute lacked a workable definition of what constituted an industry certification. TEC §28.025 authorized performance acknowledgements on students’ diplomas for those who earned industry certifications. In 19 Texas Administrative Code (TAC) §74.14 (e) (2-3), the State Board of Education recognized certain attributes that qualify various attestations of achievement as recognized industry certifications. This ensured that the achievement represented the acquisition of foundational skills and learning to ensure meaningful educational attainment. This fulfilled the public education goal of preparing students for success in postsecondary endeavors, whether they were succeeding directly in the workplace or pursuing higher educational opportunities (TEA CTE, 2017).

- *Labor Market Information Including Conditions Index (LMI)*: Measurement tool by the Federal Reserve to gauge the momentum of the labor market of the United States using a variety indicator, such as unemployment, vacancies, or confidence surveys. The LMCI evolved into labor market information and for this study, this definition was attached to workforce development area information (see WDA) (Federal Reserve, 2017).

- *Local education agency (LEA)*: As defined in ESEA, a public board of education or other public authority legally constituted within a state for either administrative control or direction of, or to perform a service function for, public elementary schools or secondary schools in a city, county, township, school district, or other political subdivision of a state, or for a combination of school districts or counties recognized in a state as an administrative agency for its public elementary schools or secondary schools (Education U. D., 2021).

- *Major suburban district (79 Texas districts)*: A district was classified as major suburban if: (a) it did not meet the criteria for classification as major urban; (b) it was contiguous to a major urban district; and (c) its enrollment was at least 3% that of the largest contiguous major urban district or at least 4,500 students. A district also was classified as major suburban if: (a) it did not meet the criteria for classification as major urban; (b) it was not contiguous to a major urban district; (c) it was located in the same county as a major urban district; and (d) its enrollment was at least 15% that of the largest major urban district in the county or at least 4,500 students (Texas Education Agency, 2020)

- *Major urban district (11 Texas districts)*: A district was classified as major urban if: (a) it was in a county with a population of at least 1,020,000; (b) its enrollment was the largest in the county or at least 70% of the largest district enrollment in the county; and (c) at least 35% of enrolled students were economically disadvantaged. A student was reported as economically

disadvantaged if he or she was eligible for free or reduced-price meals under the National School Lunch and Child Nutrition (Texas Education Agency, 2020).

- *Non-CTE student*: A student who never enrolled or who did not complete a high school CTE course as defined by 19 TAC Chapter 126 ©, 127 (B), or 130 (Texas Education Agency, 2019).

- *Non-metropolitan: fast growing district (31 Texas districts)*: A district was classified as non-metropolitan: fast growing if: (a) it did not meet the criteria for classification in any of the previous subcategories; (b) it had an enrollment of at least 300 students; and (c) its enrollment increased by at least 20% over the past five years (Texas Education Agency, 2020).

- *Non-metropolitan: stable district (166 Texas districts)*: A district was classified as non-metropolitan: stable if: (a) it did not meet the criteria for classification in any of the previous subcategories; and (b) its enrollment was equal to or greater than the median district enrollment for the state (Texas Education Agency, 2020).

- *Other central city district (38 Texas districts)*: A district was classified as other central city if: (a) it did not meet the criteria for classification in either of the previous subcategories; (b) it was not contiguous to a major urban district; (c) it was located in a county with a population of between 100,000 and 1,019,999; and (d) its enrollment was the largest in the county or at least 75% of the largest district enrollment in the county (Texas Education Agency, 2020).

- *Other central city suburban district (164 Texas districts)*: A district was classified as other central city suburban if: (a) it did not meet the criteria for classification in any of the previous subcategories; (b) it was in a county with a population between 100,000 and 1,019,999; and (c) its enrollment was at least 15% of the largest district enrollment in the county. A district

was also other central city suburban if: (a) it did not meet the criteria for classification in any of the previous subcategories; (b) it was contiguous to another central city district; (c) its enrollment was at least 3% that of the largest contiguous other central city district; and (d) its enrollment was equal to or greater than the median district enrollment for the state of 897 students (Texas Education Agency, 2020).

- *PIC22 (Program Intent Code-22)*: Program intent code identified the cost of instruction and other services directed toward a particular need of a set of students. PIC 22 referred to the cost associated with CTE students in Texas accounting within the Financial Accountability System Resource Guide (see also FASRG) (PEIMS Data Standards, March 2012).

- *Required minimum spending*: The percentage of minimum spending in each program intent code for direct cost of instructing a program for a specific set of students. Example: CTE programs must spend 55% of an individual LEA's allotment in direct cost to instructing the program (FASRG, 2020).

- *Rural district (466 Texas districts)*: A district was classified as rural if it did not meet the criteria for classification in any of the previous subcategories. A rural district had either: (a) an enrollment of between 300 and the median district enrollment for the state and an enrollment growth rate over the past five years of less than 20%; or (b) an enrollment of less than 300 students (Texas Education Agency, 2020).

- *Texas Workforce Investment Council (TWIC)*: A governor-appointed statutorily board responsible for promoting the development of a well-educated, highly skilled workforce for Texas and advocating for an integrated workforce system that provided quality relevant services that address the needs of Texas' businesses and workers (Texas Education Agency, 2019).

- *Workforce Innovation and Opportunity Act (WIOA)*: Landmark legislation that was designed to strengthen and improve our nation's public workforce system and help get citizens, including youth and those with significant barriers to employment, into high-quality jobs and careers and helped employers hire and retain skilled workers (DOL, 2020).
- *Texas Skills Standards Board*: In 2015, the Texas Skills Standards Board was abolished, and its powers were transferred to the Texas Workforce Investment Council (TWIC, 2020)
- *Texas Workforce System*: Composed of several programs, services, and initiatives administered by eight state agencies, the Texas Association of Workforce Boards, local workforce development boards, community and technical colleges, and local adult education services (Texas Education Agency, 2019).
- *Workforce development area (WDA)*: A workforce area designated by the governor and functioning as a local workforce investment area. There were 28 local workforce development areas in Texas (Texas Workforce Commission, 2021)

Organization of the Study

This dissertation is organized into five chapters. Chapter 1 provides a general overview of the quantitative study, including the purpose, the undergirding theoretical framework, the statement problem, research questions, and significance of the research. Chapter 1 also discusses the delimitations and assumptions as well as gives an in-depth look at definitions of terms used throughout the text. Chapter 2 provides a review of the history of CTE, how it came to pass in secondary public education, and the policies that had shaped and governed the work of CTE. Additionally, the chapter takes a deep dive into the current literature and research around CTE and workforce development in Texas. Chapter 3 describes the research design; a detailed

description of the data, participants, variables examined; instrumentation; data collection and data analysis procedures; limitations, significance, and threats to validity; and the ethical considerations of the study. Chapter 4 presents the results of the analysis of the archived data and the examination of the statistical correlations found. Chapter 5 offers a summary of the findings, discussions, conclusions, implications, and recommendations for further studies.

Summary

This dissertation study examined an extensive set of archival data and cross-referenced a variety of data not previously published in conjunction with one another. This data included all non-charter public schools who had CTE programs in the defined North Central Texas region and each local school's defined district type category description. The focus on program alignment was examined in conjunction with three independent variables: the correlation between program alignment in each school and federal Perkins' grant funding; the degree to which programs dedicated federal and state spending based on defined district type; and the overall aggregate alignment of North Central Texas CTE programs of study to high-wage/high-demand regional workforce development data.

CHAPTER 2

REVIEW OF LITERATURE

The review of literature revealed a large body of work around the historical needs and effectiveness of career and technical education (CTE); however, little existed around the scope of this study. For this review of literature, a thorough examination of Perkins V federal law, labor market needs, and historical program alignment is included. Literature for this review was obtained electronically through databases accessed through the University of North Texas, Fort Worth Public Libraries, Association of Career and Technical Education Research Network, ERIC, Sage Journals, and Perkins Collaborative Resource Network.

Origination of Vocational Education

Morrill Land Grant College Act 1862

The Continental Congress established precedence in its support of education and in the Northwest Ordinance of 1787. This dedication to knowledge as something being good for the future happiness of mankind and dependent on education would hold the commitments of the republic to this day on that of an obligation in providing schools to its' citizens. To understand the designation of CTE as it is today, an exploration of its origin was essential. The Morrill Land Grant College Act of 1862 laid the foundation for most of the state colleges and universities in the United States. This act reshaped the nation's social and economic fabric by chartering major universities that would bring education to most U.S. children. The designation of 30,000 acres to each state as public land for each representative and senator in Congress designed the patchwork of educational opportunities and provide evidence of the first levels of reformation misuse through federal supplication. The colleges to be established within the systems were for the benefit of agriculture and the mechanic arts. More than 100 million acres of land, which were the

key assets of the country, were not always used for school construction, but many states found revenue from land sales to be more enticing than provisions of higher education for existing state or private colleges (National Archives, 1995, p. 57).

To meet the needs of what was a growing industrialized nation, the Morrill Act sought to have education seen beyond a state matter. On July 2, 1862, after wading through opposing political circumstances, President Abraham Lincoln signed the Morrill Act into law. This pervasive understanding of education for all, especially those who sought to receive an education that met practicality and the demands of a growing country seeking a more perfect union, became the cornerstone of the higher education system. In 2012, land-grant universities reported enrolling more than 4.6 million students (Loss, 2012). The commitment to serve our citizens through education as one republic had been essential to the economic fabric and success of U.S. society (Loss, 2012).

Manual training and education for public schools had its first educational report from the Secretary of Education by Nathaniel H. R. Dawson L. H. D in 1887-1888. The report covered the year ending on June 30, 1888 and was sent to the President. The second part of this report was partly in response to the Special Report for American Education in Fine and Industrial Arts as part of a resolution from the Senate in February 1880. The report thoroughly examined the “movement for industrial training,” which at the time garnered much attention, not only in the United States, but throughout the civilized world.

Manual training schools replaced the language learning of Greek and Latin, as “the male pupil having now attained to sufficient strength, was brought face-to-face with two great materials of construction, wood and iron, and was made familiar the construction of that important feature of our age, the steam-engine” (Dawson, 1889, p. 826). The manual training

schools introduced drawing in early grades and appeal to the power of expression. Progressives of this movement romanticized the notion of expression by delineation and construction. A wide variety of opportunities grew throughout the northeast and west to Illinois and Nebraska. These public schools offered higher math, science, some foreign language, English, history, and civics; while coupling a three-year plan with wood, forging, and machine shopping. Some courses included technical drawing and three years of math, including algebra, geometry, and trigonometry. Principal Klemm of the Miller Manual Labor School remarked “this is virtually high school courses minus the dead languages, but plus the manual training” (Dawson, 1889, p. 902). Nonetheless, the findings of Dawson and his committee reminded all that these opportunities for education were not a finishing school that turned out workmen or completely educated men. They were preparatory schools, preparing their pupils to begin work in the world as an apprentice or to enter upon a college, career, as “each may elect, or circumstances dictate” (Dawson, 1888, p. 826). By today’s standards, current legislation and reporting could say the same thing for secondary schools that embrace CTE with academic attainment.

Smith-Hughes 1917

Cornell University, New York State’s land-grant university established in 1865, enacted the ideals considered through Morrill’s understanding of practical can-do learning and earning combined with founders Cornell and White’s commitment to the “curation of knowledge” to design a university committed to excellence. Featured in Dawson’s Educational report of 1888, Cornell had the largest endowment of any land-grant college and embraced a full classical and scientific curriculum. With “the ability of its faculty and the scholastic standards maintained,” (Dawson, 1889 p. 736). justly entitled Cornell to rank among institutions of the highest order. In 1900, Michigan Agricultural College (Michigan State University) graduate Liberty Hyde Bailey

served as founder and chair of the College of Agriculture for Cornell University. An elected fellow of the American Academy of Arts and Sciences, Bailey wrote of the need of school-training to relate to daily-life in 1904 (Bailey, 1896-1904, volumes 1-38). Bailey told of the teaching power of every subject by reaching people in terms of their daily experiences. This thought of progressive education was affirmed by philosopher John Dewey in that “school would be a community in two senses: it would be a place where teachers and students lived and worked together, in fulfillment of task[s] that were often not different from those of the surround[ing] society” (Lagemann, 1989 p. 186).

At a time when reform was being sought and the philosophical frameworks were moving away from Greek and Latin, educators and organizations were calling for a change in curriculum and an increase in training that compelled students to pursue education beyond the eighth grade (Barlow, 1967). Removing oneself from the educational system was apparent, as only 5% of students enrolled in schools were of high school age. F.V. Thompson, superintendent of schools for Boston in 1916, wrote of being unsuccessful in holding the attention of the students and not meeting the interest of pupils. This framework that had been emphasized by Bailey and Dewey revealed that “the world in which students were being taught, was not of the world in which they actually lived” (Lagemann, 1989) . Dewey later wrote in support of the “intimate and necessary relation between the process of actual experience and education” (Lagemann, 1989, p. 7).

In November 1906, the National Society for the Promotion of Industrial Education (NSPIE) was created to inform and influence public favor for an educational system that promulgated industrial pursuits and the establishment of industrial training. In 1908, its first annual convention was held in Chicago, where the establishment of 38 individual state committees were realized. In addition, an appointment of a national commissioner who was

dedicated to the promotion of propaganda for industrial education was the most noted outcome of this convention. Organizing the various branches and mobilizing community commitment to common understanding of industrial education required a strategic effort. The NSPIE was committed to the promotion of industrial education as

a full knowledge of the social, educational, and industrial conditions and sentiments prevailing in the state would recommend, and to unite the interested people of a commonwealth for active work that must appeal to them with particular force, as it deals with the needs and well-being of their own community (Wright, 1909, p. 17).

This leveled influence would set the stage for mobilization of legislation for authentic education, one where young people in the country were enabled to secure employment in skilled trades “rather than idle their lives away” (Wright, 1909, p. 22) in unskilled callings.

With influence from the NSPIE group and its vast and prominent members, industry, organizations, banking, and education members of Congress began promoting the need for a national system of vocational education, rather than simple reliance on states to provide education that reflected the world or future world in which a student lived. However, along the way to providing legislation around secondary schools, the land-grant college system and the establishment of said colleges provided agricultural agents to demonstrate a variety of techniques to farmers and homemakers. This bill was introduced and eventually passed as the Smith-Lever Bill of 1914. To reach consensus among the needs for secondary education and the work of extension, the National Aid for Vocational Education (NAVE) was established.

On January 20, 1914, Congress approved NAVE, which allowed the president of the United States to appoint a commission of nine members. President Woodrow Wilson then appointed

- Senator Hoke Smith of Georgia
- Senator Carroll S. Page of Vermont

- Representative D.M. Hughes of Georgia
- Representative S.D. Fee of Ohio
- John Lapp, Director for Indiana Bureau of Legislative Information
- Miss Florence M. Marshall, Manhattan Trade School, New York
- Miss Agnes Nestor, President International Glove Workers Union, Chicago
- Charles A. Prosser, Secretary for the National Society for the Promotion of Industrial Education
- Charles Winslow, special agent for the Bureau of Labor Statistics

This commission of nine was charged to answer the following questions:

- 1.) To what extent was there a need for vocational education in the United States?
- 2.) Was there a need for national grants stimulating the States to give vocational education?
- 3.) What kinds or forms of vocational education should be stimulated by national grants?
- 4.) How far could the Federal Government aid the states through expert knowledge vocational education in the various states?
- 5.) To what extent should the Federal Government aid the States through national grants for vocational education?
- 6.) Under what conditions should grants to the States for vocational education be made? (United States, 1914, p. 10)

On June 1, 1914, the Vocational Education Report of the Commission on National Aid to Vocational Education was referred to the Committee on Education and ordered to be printed.

The summation of findings were an urgent demand for vocational education that prepared workers for common occupations in which many people could find useful employment. The vocational education recommendations were a wise business investment to secure our place in the world markets and ensure prosperity and happiness. This committee's findings espoused for dignity for all and an educational system that connected purpose in life by making it useful. In addition, better education increased wage earning capacity. The report lamented that the

businessman, social worker, philanthropist, educator, and manufacturer agreed the future welfare of the nation lay with the establishment of vocational education (United States, 1914). Although alignment might have been found amongst the businessman and philanthropist, the unintentional consequences of separating vocational and academic learning catalyzed for aligned or misguided progressive philosophers and advocates of meaningful learning experiences based on the definitions one held for the word occupation (Herren, 1987).

Fourteen days after the report filed to the Committee on Education, the assassination of the heir to the throne of the Austro-Hungarian Empire began political maneuvering that eventually grew to be known as the Great War. From July 28, 1914, to November 1918, nearly 22 million lives would be lost. During this time, as the nation's involvement in World War I increased, so too did the need for education reform based on the report recommendations for vocational education. Introduced to the Senate in 1915, the Smith-Hughes Act was signed into law by President Wilson on February 23, 1917 (Herren, 1987).

The Smith-Hughes Act was designed to meet the needs of the report and to answer the questions of the committee for National Aid to Vocational Education. The start of World War I cut off the sources of highly skilled immigrants from Europe, which in combination with an educational system that emphasized classic liberal arts curriculum and ensured the federal endorsement of the comprehensive high school. This approach allowed students to learn both in theory and practice and in "which the dignity of manual work would be valued (Hayward & Benson, 1993, p. 13). Not trusting that the current system could provide the experience needed to execute the vocational curriculum, the federal government used the act to establish separate Boards for Vocational Education in each state. In some states, two separate boards existed for the governance of state secondary academic schools and vocational education, respectively. The

vocational board supported by federal dollars would initiate a state plan, which was a compliance document that showed how federal mandates would be met. The primary compliance centered on expenditures and the work done in the state around Vocational Education.

This separation of boards for education additionally separated teachers and students. The separation of funding around teachers was intended to ensure those teaching vocational education had experience in their vocation of program teaching and that funding would not be provided for *academic* teachers. This segregation pulled vocational education from mainstream school operations. Delineation in students served by vocational teachers also segregated students, whereas with students who received instruction from a teacher who was salaried either in part or full by federal vocational funds, the students could not receive more than 50% of their time in *academic* instruction (Hull, 2005; Meeder, 2016). Controlling the students' time ensured by Federal Vocational Board standards that students spent at least 50% of their day engaged in *shop* activities. For nearly 40 years, this practice reigned vocational educational settings across the country.

This segregation by way of time, effort, and funding had vocational teachers more focused on instruction around job-specific skills to the exclusion of theory. The diminished academic rigor and lack of problem solving with job skills led to a diminished development in intellect for some and a lack of transportable skills for the workplace. Within the vocational arena, further segregation occurred through agriculture, homemaking, and industrial education. The pursuit of uniting vocational learning fragmented vocational programs for the foreseeable future increased the practice of tracking students (Hull, 2005; Meeder, 2016).

During the time between World War I and World War II, government officials instituted intelligence testing, based on the belief that all intelligences were fixed, innate, and strongly

correlated to race and ethnicity. This type of outlook dominated the need for schools to provide different curriculum for different students. The Prosser Resolution of 1945 sought move each individual back to the “circumstances” to which they were born. Prosser argued that high schools were serving 20% of their population as appropriate for college education, 20% for vocational education, and that 60% of the population needed *life adjustment-education* to prepare them for low-skilled work or homemaking responsibilities. The assumption that education could serve as (United States, 1983) a means to which a person could move up the social ladder was not universally adopted and would impact the culture of U.S. education (Hull, 2005; Meeder, 2016).

Due to wars, unemployment, recession, and a country fraught with inequities, the Smith-Hughes Act stayed relatively unchanged until 1963. Throughout this time, enrollment had grown, state spending matched the millions of dollars expended by the federal government, and for all intents and purposes, concerns about the segregated student population were not at the heart of educational reform. Further, vocational education was not yet seen as a vehicle for preparing students to pursue a quality postsecondary education. Throughout its time, the Smith-Hughes Act enforced a code upon its own system to segregate and was in direct opposition to academia (Hayward & Benson, 1993).

The Vocational Education Act of 1963

Realizing its potential for educational reform, the federal government began to expand its influence on the system of education, serving as beneficiary or casualty to an increase in education legislation. In 1958, the National Defense Education Act was established in a post-World War II movement to provide vocational education programs an increased focus in science and math along with postsecondary access to marginalized populations. Next, the Area Development Act of 1961 specifically sought to address urban communities’ need for training

and upskilling to mitigate unemployment or underemployment. In 1962, President John F. Kennedy attempted to defeat unemployment due to automation and technological change through additional legislation. The Manpower Development and Training Act of 1962 was designed to help unemployed workers develop the skills necessary to take advantage of expanding occupations (Kremen, 1974).

At a time when the country was faced with burgeoning areas of urban poverty, depressed communities were likened to mental and physical handicaps for children, and thus the Vocational Education Act of 1963 was designed to ensure funding for training or retraining youth through experimental programs. Many of the vocational education social reforms were sent as a special refuge for poor minorities rather than training for those in need. Federal functionality and oversight also required five-year plans for each state, as well as projected enrollments, goals, and alignment with training opportunities. These amendments to the 1963 law continued to strengthen the congressional hand, yet the limitations of the funding would create apathy around enforcement and structures of non-compliance (Hayward & Benson, 1993).

The Great Society continued its expansion with Lyndon B. Johnson and social welfare legislation. The Economic Prosperity Act of 1964 was passed in an affront to identify the social failure of a country rather than amoral failing of the poor. Continuous criticism over this reform designed to go to “war on poverty” along with expansion of federal programs and agencies were controversial in measured benefit for generations to come (Cooley, 2020).

For the first time, legislation would allow education programs to be based on actual or anticipated employment opportunities for anyone. This legislation brought the establishment of the National Assessment of Vocational Education (NAVE) to assess and evaluate the progress of vocational education. This was deemed essential since the provisions also included

postsecondary students. During this time, all states designated the State Board of Education as the sole supervisor and agent administrator for vocational funding. Such reform also required spending in state administration, program evaluation, and the development of new instructional materials (Stipanovic, Lewis, & Stringfield, 2012).

Amendments in 1972 and 1976 for the Vocational Education Act placed additional priorities for implementation to address concerns around services to “disadvantaged and handicapped youngsters, program bias against women, lack of career counseling, and lack of job placement” (p.13). Subsequent years initiated an evaluation conducted that would address three points of reform. First, previous legislation was ambiguous and conflicting. Second, the government was trying to regulate more than they could fiscally afford through grants and distribution channels. And finally, marginalized populations were disproportionately underrepresented in demanding programs that would provide an avenue to a “good job” (Hayward & Benson, 1993 p.11).

The Carl D. Perkins Vocation and Technical Education Act of 1984

Post-World War II saw an increase in requirements for careers that connected math, science, and language arts. Throughout this time, the Vocational Education Act and subsequent amendments and reauthorizations sought to address little in the way of academic attainment for marginalized populations, that was until 1984, when legislation placed a more prominent emphasis on access to programs for students from marginalized populations and developing a quality modern program. Jobs in manufacturing were less pervasive and the emergence of a globalized nation around trade, transportation, and technology would pressurize the U.S. workforce (Meeder, 201; Stipanovic, Lewis, & Stringfield, 2012).

Carnevale, Garcia, and Campbell (2017) explained that in the 1970s, three out of four

jobs required high school education or less, yet in 2015 two out of three jobs required some form of postsecondary education. A shift in economic independence and wage earning at the median level was on average occurring around age 30, and the Carl D. Perkins Act of 1984 required a more connected education. For the first time a vocational education act specifically sought to increase the quality of technical education within the United States by providing individuals with the academic and technical skills necessary to be successful (U.S. Government, 1984).

Beyond access and educational attainment, the Perkins Act sought to create greater cooperation between public and private agencies to develop a more responsive system to labor markets. Additional priorities were centric to career guidance, retraining, newer technologies, and diminishing gender stereotyping (U.S. Government, 1984). In 1981, President Ronald Regan designated the National Commission of Excellence in Education. This committee comprised of 18 individual members sent a fracturing report just six months prior to the 1984 Perkins Authorization. In the April 1983 report, *A Nation at Risk: The Imperative for Educational Reform*, found a “rising tide of mediocrity” that had deteriorated the educational foundation of U.S. society. This indictment on the U.S. public education system told the story of a diminishing return in the way of students who become innovators, leaders, and thinkers in technological advancement. The reform measured school quality based on student outcomes instead of resources received and measures were defined around minority or special population status (OECD, 2017).

Perkins Reauthorization 1990-1998-2006

The Carl D. Perkins Vocation and Applied Technology Act of 1990 sought to measure accountability around and strengthen opportunities for economically marginalized students of “special populations.” This legislation would provide a new guidance on instructional matters

and contextual learning. Afterward, NAVE published Lana Muraskin's May 1989 report on the Carl D. Perkins Act II.

The 1989 report found a variation of funding formulas from state-to-state, with postsecondary institutions receiving anywhere from 8% of a state's share of federal funds to as high as 100%. In addition, targeting efforts were difficult to find by way of poverty, minority status, or postsecondary Pell Grant assistance. Little to no systematic distribution mechanism existed for facilities that bore the label "*comprehensive high school*," whereas vocational high schools, facilities, and alternative school settings had tendencies to track qualified student enrollment and services provided. However, districts setting aside funds for academically disadvantaged students for increased assessments rarely set aside funds for those same students to provide academic remediation, summer jobs, alternative schools, curriculum modifications, or guidance and counseling. Instead of using funds to address sex equity in program enrollment, performance of students deemed with a disability in terms of a physical or cognitive impairment, graduation rates of teen parents and single parents, reskilling of displaced homemakers, or increased adult and correctional education; a vast majority of program improvement funding went to the purchase of equipment.

Muraskin's evaluation came up with 20 recommendations that found their way in the subsequent reauthorizations of the Carl D. Perkins Acts of 1990, 1998, and 2006. Additional evaluations in 2004 combined a post-Internet era of understanding to the legislation along with recommendations around increased data reform. Recommendations prior to the reauthorization of 1990 focused on the allocation of funding that more directly targeted disadvantaged areas and schools with the greatest need for additional wrap-around services. The targeting of priorities for an individual state plan focused on students with the greatest needs, reduced assessments, and

increased instructional services. Final recommendations were to ensure equal access and increase equity while maintaining a more fiscally transparent process for non-supplanting of provisions (Muraskin, 1989).

David Boesel released a NAVE report in July 1994 following the four-year implementation of the current Carl D. Perkins 1990 legislation, which required states to develop and implement performance standards and measures. At this time, academic curriculum along with vocational experiences were to be combined in a local plan while encouraging postsecondary education. Doubling down on workforce reforms, the legislation encouraged funds to be used for work experience programs, cooperative education, and apprenticeships to provide school-to-work opportunities.

The performance standard measures were in direct alignment with conversations around the *Nation at Risk* documents. The NAVE 1994 report sought to measure high school graduation, incorporation of core academic curriculum, rigorous education standards, increased teacher training, and more efficient use of learning time. The elevation of the *Nation at Risk* report (United States, 1983) was met with strong criticism. A year after the report's publication, the National Commission on Secondary Vocational Education published its own report, *The Unfinished Agenda: The Role of Vocational Education in the High Schools?* (Education T. N., 1985). The report findings encouraged an increase in student depth of knowledge in core academia including fundamental skills in reading, writing, math, speaking, listening, and problem solving. The applied knowledge approach could potentially bridge the gap between secondary academic work and vocational education. (Boesel, 1994).

Throughout the report, references of vocational education enrollment being on the decline for more than a decade were prevalent. With academic reform, the cumulative effect of

educational reform in the United States had been thought to diminish vocational education, by reducing offerings, and marginalizing its students (Milne, 1998). This administrator perception was realized in the Omnibus Secondary State and District Surveys. Seventy-one percent of administrators said vocational enrollments decreased because of educational reforms. However, when examining programs that had undergone reforms and restructure, many programs were showing increased enrollment. Deborah Strickland's *U.S. Enrollment Patterns in Secondary Vocational Education: A Status Report* (1982-1989) made evident that vocational programs that did not restructure were experiencing decreased enrollment. Strickland's findings suggested that the resistance to change was due in part from "lack of leadership, diminished image of vocational education," (p. 23) or the lack of adaptability within vocational education.

Nevertheless, Bosel's report detailed reform measures that aligned to educational reform across states. Withstanding an increase in performance measures, states went on to usher new initiatives around industrial skills standards, curriculum integration, tech-prep programs, and work-based learning. These tenants held true to the reauthorization of Perkins in 1998 and 2006.

In 1994, the U.S. Department of Education partnered with the U.S. Department of Labor to jointly draft and pass key legislation. The School-to-Work Opportunities Act allowed states to build employer-based internships, work-based learning opportunities, and experience curriculum in a non-traditional active learning environment that allowed students to connect school experiences with future careers. This act was developed to align with the Educate America Act and the National Skill Standards Act of 1994. Many of the goals of the School-to-Work Opportunities Act would be visible in later Perkins legislation; guidance, industry partnerships, and postsecondary opportunities would undergird the work (School-to-Work Opportunities Act 1994; Hull, 2005).

The Carl D. Perkins Vocational Education Act of 1998, also known as Perkins III, included specific language for funding of leadership activities, prison education programs, nontraditional programs, and employment. Performance standards were leveraged to measure accountability. Consistent with past legislation was a reinforcement to improvement in academic integration, teacher professional development, and expansion of technology usage. Vocational education always relied on the partnership of business and industry; however, Perkins III called for specific local partnerships to be formed with labor organizations and employers. In addition, the tech-prep grant program required the use of funds to align with secondary and post-secondary pathways in engineering, technology, applied science, health, and applied economics.

In addition to alignment with postsecondary opportunities, Perkins III eliminated all special programs realized in Perkins II of 1990. These programs included programs conducted by community-based organizations, consumer and homemaking education, guidance and counseling programs, business-labor-education partnership for training, supplemental grants for facilities and equipment, community education employment centers, and Vocational Education Lighthouse Schools. The changes were implemented on the front end of overwhelming education reform legislation. The change to vocational education was more visible than ever before. So much so that in 1998 the National Association for Vocational Education became the Association for Career and Technical Education. The name change was in direct response to the changing nature of “job-specific vocationalism to education that can prepare all for long-term career success” (U.S. Government, 1998; Skinner & Apling, 2005).

No Child Left Behind (NCLB) and Vocational Education Courses

For the first time, both the Elementary and Secondary Act (ESEA, 1965) plan and the vocational education plan were related and had opportunities for integration. The ESEA was

reauthorized as No Child Left Behind (NCLB, 2002) and its laws required ongoing clarification throughout their implementation. This robust legislation, more than 1,000 pages in length, necessitated monitoring, and guidance for all stakeholders. Overall, NCLB and Perkins III called for an alignment of state and local plans, and both plans required recommendations for schoolwide improvement.

Plans for school improvement sought by NCLB (2002) were attached to the closely scrutinized policies around increased achievement levels as a result of the act of raising standards by testing. The accountability requirements contained within NCLB were designed to have students and schools increase performance. NCLB was touted by legislators as an incentivizing tool to close academic performance gaps between majority (white) students and minoritized students who might be impacted by contexts and circumstances such as economics, ethnic minority backgrounds, or limited English proficiency. Finally, each individual school was expected to report student performance results by income, race, abilities, and home language due to the reasoning that such a breakdown could help the public determine whether NCLB's argument held true, and schools were indeed leaving children behind. With this increase in awareness and accountability, it would also ensure that all teachers were deemed highly qualified in the core academic areas. Although the legislative requirements related to the highly qualified moniker were not extended to apply to CTE teachers, many district-level CTE programs required CTE teachers to have a bachelor's degree, teaching certificate, and expected them to pass a subject area test.

NCLB mandates required students to have made AYP (average yearly progress) as shown by assessments in reading, science, and math. This pursuit of progress removed students from technical courses to take more academic courses in the pursuit of academic achievement

(Fletcher Jr. , 2006) Critics of NCLB highlighted that CTE students already took academic courses, and to falsely assume the increase in academic course enrollment at the reduction of CTE was to assume that CTE courses did not support academic achievement. Previous legislation had sought to rectify the division of vocational education from academic education, yet NCLB left an entire subject area behind. A recommendation was made that CTE students should be identified by states as a subgroup for performance, and that CTE performance goals aligned with NCLB and Perkins, which “eased the burden of data collection on the same students” (Phelps, 2002).

By 2004, a public-private venture funded by the Bill and Melinda Gates Foundation, Educate Texas, became a long-standing intermediary for early college opportunities, bridging the Texas Education Agency and the Texas Higher Education Coordinating Board together to increase postsecondary success of low-income students and low-performing schools. This partnership still stands today and has redesigned Texas as a home to 198 early college high schools, 41 new designed school campuses, focused T-STEM opportunities, innovative academies, and most recently P-Tech centers. The alignment of public and private opportunities during this time was preemptive and forward thinking, as it applied to the new federal expectations of Perkins legislation.

Changing Perkins Legislation

NCLB set out to reach performance by 2013-2014 in that every student reached specified levels of “proficiency in reading, language arts, and math” (Hull, 2005, p. 92). The “new basics” curriculum increased required core content of a high school student and improved the opportunities of CTE concentrators, or those students who had taken three or more years of CTE courses in a specified “occupational area such as health, automotive, and technology” (Hull,

2005, p. 92). With greater scrutiny on student achievement and a realization that nearly 40% of American high schools did not have an agreement with or transition to postsecondary education, federal policies needed to expand the opportunities for students who planned to pursue postsecondary education or enter the workforce to earn college credits (Hull, 2005). On February 3, 2003, budget proposals around vocational education and adult education totaled \$1.591 billion. However, the \$1 billion requested for Secondary Technical Education no longer carried the provisions of the former Vocational Education Act and Perkins. The exact language had a new set of priorities that focused spending on students to make a “successful transition from high school to college and college to the workforce” (Federal Workforce Overview, 2004). During a period of negotiations and a variety of bill proposals, opposing sides sought to diminish the directives for non-traditional student placements with direct spending by providing services for these students and focusing more on higher priority activities that were more effective in supporting academic achievement and postsecondary opportunities (U.S. Government, 2003).

The Carl D. Perkins Career and Technical Education Act of 2006, known as Perkins IV, was signed into law by President George W. Bush and set about specific language that supported the development of academic and technical skills in both secondary and postsecondary settings for the next six years. The naming of the act was the first time “career and technical” replaced the words “vocational and technical.” This act was where public schools first experienced the culmination of career pathways and coherent sequence of courses to create programs of study (POS). The programs of study were a major innovation that incorporated all critical “aspects of CTE: academic standards, CTE skills, and a progression from secondary to postsecondary education, and an industry-recognized credential” (Dortch, 2012, p. 18).

The 2006 legislation required each state to submit a six-year plan to receive funding. The

plan components were to be developed by stakeholders including teachers, faculty, administrators, counselors, parents, special populations, business, industry, and labor boards. The larger plans of the state incorporated state leadership activities as well as outlined how local activities were to be monitored. A local plan had seven required elements and seven permissible uses of funds. According to Congressional Research Service (Dortch, 2012), local plans must include the following:

- CTE programs that were to be carried out, and how these programs will support meeting the state and local adjusted levels of performance
- At least one state approved CTE program of study that would be adopted
- The integration of academics with CTE courses in order to ensure improved student learning and attainment of technical skills and academic proficiency
- Professional development activities for CTE teachers, administrators, and career guidance and academic counselors
- How students would gain experience in and knowledge of all aspects of an industry
- Efforts to improve CTE outcomes of members of special populations and individuals in nontraditional fields
- Any other requirements established by the state eligible agency

Local use of funds included:

- Strengthened academic and technical skills of CTE students
- Linked CTE at the secondary and postsecondary levels, including by offering the relevant elements of at least one state-approved program of study
- Provided students with experience in and understanding of all aspects of an industry
- Developed, improved, or expanded the use of technology in CTE
- Provided professional development programs for CTE personnel
- Developed and implemented evaluations of CTE programs
- Provided CTE activities for members of special populations to prepare them for high-skill, high-wage, or high-demand occupations

The overall implications of the legislation increased accountability, collect and reported performance data, levied sanctions on funding, and required corrective action for those states that failed to implement and meet aligned plans (Foster, Klein, & Elliott, 2014).

In an era of data-driven decisions, Perkins IV set aside funds for the National Assessment of Career and Technical Education (NACTE) to conduct a program evaluation for CTE. The findings shaped further legislation as well as influenced future research. Once again, evaluations of legislation found the primary use of funding was to purchase equipment, however, there was an increase in providing guidance and academic counseling to students. The evaluation showed that teachers or instructors at either secondary or postsecondary levels did not understand Programs of Study (POS), and the lack of alignment with understanding from state to state prevented the ability to provide performance comparisons. The completion rates of CTE students in college preparatory work had increased, however, it varied greatly by program of study. Some of these findings could be linked back to the root cause of understanding program alignment, and the lack of common language around data (Foster, Klein, & Elliott, 2014).

A Pathway beyond Perkins Legislation

In 2011, the Harvard Graduate School of Education (HGSE) released the *Pathways to Prosperity: Meeting the Challenge of Preparing Young Americans for the 21st Century*. This overwhelming transparency around college education, the labor market expectations, and the nation's failure to invest in a "high-quality" system that made successful transition of young people into the labor market was both profound and provocative, yet not new. The ideas of the collaboration needed to redesign the pathway to work had been a lifetime commitment for many of the participants and a fragmented effort across the country. The formation of the Pathways to Prosperity Network sought overwhelming support from all sectors, and a federally legislated

definition for the career pathway (Pathways to Prosperity Network, 2014; Meeder, 2016).

While federal rule took time, Texas House Bill 18 passed in 2015. The expectation of improving the availability of high-quality college and career advising provided significant legislation to educate counselors, advisors, and students about the range of opportunities and career pathways. House Bill 5 Foundational High School Program was established in 2013, which brought about new graduation requirements such as endorsements for Texas graduates. HB 18 focused on professional learning and technology advising tools. The Texas OnCourse initiative brought together the Texas Education Agency (TEA), the Texas Workforce Commission (TWC), and the Texas Higher Education Coordinating Board (THECB). The content delivered was a direct response to better advising students and thus supporting them toward a successful, more meaningful postsecondary opportunity (Hoffman, Schwartz, 2017, pg. 136).

The Timeline to Perkins V Authorization

Upon expiration of Perkins IV, in April of 2012 the Association for Career and Technical Education (ACTE) released guiding principles for renewed legislation and improvement of CTE. These principles defined program quality, created common and consistent data, offered incentives for innovation, and provided supportive infrastructure for the entire CTE system. Three days later, President Barack Obama's administration released a blueprint for reauthorization. Priorities from the administration and ACTE were not in steep alignment. However, as congressional leaders held hearings around CTE and workforce, emerging themes on program quality, postsecondary connections, industry pathways, and labor market alignment moved to the forefront of legislative considerations. During this same time period of June 2014, more than 600 businesses, industry executives of Fortune 100 companies, labor boards, and a

wide variety of state, local, and national education leaders from across the country were convening at an invitation only conference for 400 people revolving around the skills employers needed and the skills employees possessed (Hyslop, 2018; Perna, 2018).

Workforce Innovation and Opportunity Act (WIOA)

One month later, Congress passed the Workforce Innovation and Opportunity Act (WIOA), which had been long overdue in reauthorizing the Workforce Investment Act. Nonetheless, the pressures surrounding legislation and change later included text in Perkins V legislation. WIOA carried terms around youth workforce investment activities, training, and adult and dislocated workers. The term *career pathway* was given definition along with specific guidance about implementation concerning the previously discussed ambiguity of programs of study had shared understanding in future Perkins legislation. Aligning both WIOA and Perkins V was a priority for congressional members and a strategy for making significant changes in a coordinated effort. For the first time, state plans for both workforce development and Perkins V required a strategic vision and goal for preparing an educated and skilled workforce. The state plans also be influenced by the Wagner-Peyser Act, which in part directs funds to states for the collection of nationwide and regional labor market information. Small changes in this element helped to ensure those state administrators who oversee Perkins V had the necessary data to align labor market information in a regional plan (Hyslop, 2018, p. 225).

Every Student Succeeds Act (ESSA)

In October 2015, Every Student Succeeds Act (ESSA) was signed into law and replaced NCLB while reauthorizing the Elementary and Secondary Education Act. Perkins V was shaped by the provisions of the 2015 legislation and referred to the law 48 times to further create a link between education and workforce. Perkins' legislation was saturated with accountability measures that included programs of study completion, graduation rates of CTE students in four

years, and most importantly the same academic achievement measures for CTE students under Perkins' accountability as for all non-CTE students. The performance data were to be disaggregated by subpopulation and used to view meaningful progress towards and improvement of performance of subgroups of students (Hyslop, 2018, p. 213).

After the passage of ESSA, a variety of conversations and hearings came forward and the Perkins reauthorization made it as far as the Senate. However, discussions stalled, and the process began again with the 115th Congress convening in January 2017. After continuous positive changes and testimony focused on programs of study, business partnerships, work-based learning, equity, and program quality, the Trump administration took an affirmative position around Perkins reauthorization. Negotiations for the next 17 months focused on apprenticeships, STEM funding, and high-school resources. Finally, in July 2018 President Trump signed into law the Strengthening CTE for the 21st Century Act, known as Perkins V (Hyslop, 2018).

Programs of Study

Based on past recommendations, Perkins V kept the term program of study and defined the term and specific monikers to meet the requirement of a program of study. The term program of study meant a coordinated, nonduplicative sequence of academic and technical content at the secondary and postsecondary level that

- (A) Incorporated challenging State academic standards, including those adopted by the State under section 1111(b)(1) of the Elementary and Secondary Education Act of 1965
- (B) Addressed 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) Progressed in specificity (beginning with all aspects of an industry or career cluster and led to the more occupation specific instruction)

(E) Had multiple entry and exit points that incorporated credentialing

(F) Culminated in the attainment of a recognized postsecondary credential (Perkins, 2018)

This definition provided guidance for alignment amongst states in defining and collaborating around state and regional programs of study. For Texas, with its vastness in size and regional diversity, a program of study based on labor market information in one area of Texas might not be appropriate for another area of such a large state. For example a program of study offered in maritime in the panhandle of Texas would provide little use where no industry or means for employment existed.

Business Partnerships

The goal of Perkins V to involve business partnerships more directly was not new, however, the execution as it applied to the comprehensive local needs assessment (CLNA) required increased commitment and collaboration of stakeholders around a local plan. Decisions for programming could not be made in a vacuum and required working with local business and industries around current and future labor markets, local, regional, and state skills, and industry-based credentials deemed valuable to industry experts. These partnerships were integral to the opportunities for innovation in work-based learning and stood as one of the 12 pillars for high-quality CTE programming (Hyslop, 2020). Research demonstrated that students who interacted with business and industry showed an increase in engagement and were provided accesses to new information, all while becoming more aware of an industry. Employers found benefits in recruiting future staff and developing a better community of learning through fresh ideas, while also helping employees develop their own collaboration skills (Mann, Lopez, Stanley, 2010; Meeder, 2016).

Program Quality: Sourced from ACTE High-Quality CTE Documents

CLNA required engagement and assessment by local CTE leaders so they might evaluate local programs and select a course of action for program improvement. In 2015, the Association for Career and Technical Education began releasing a series of high-quality CTE guidance documents with 100 indicators across 12 pillars. The pillars had indicators regarding program scope, size, quality, and the impact of delivery and implementation. This self-assessment was a tool that could be used to assist a local district in planning and completing a state's requisite CLNA for funding purposes. Moreover, these documents helped stakeholders see areas of success and improvement that could be articulated to the larger community. This metacognitive process included a series of questions that nicely aligned with the work and expectations of Perkins V and the profile of a comprehensive successful CTE program. The pillars included:

- *Access and equity*: This element addressed program of study promotion, student recruitment, and strategies that supported access and equity for various student populations, including by gender, race, and ethnicity, and special population status (such as individuals with disabilities, individuals from economically disadvantaged families, and English learners).
- *Business and community partnerships*: This element addressed business and community partner recruitment, partnership structure, and the wide variety of activities partners should be engaged in to support the program of study and ensure programs are aligned with workforce needs.
- *Career and technical student organizations*: This element addressed CTSOs, which were organizations for individuals enrolled in CTE programs that engaged in activities as an integral part of the instructional program, including the delivery and availability of CTSO opportunities for student skill and leadership development.

- *Data and program improvement:* This element addressed collection, reporting, and use of data for continuous evaluation and program improvement, as well as appropriate access to relevant data.

- *Engaging instruction:* This element addressed instructional strategies within a student-centered learning environment that supported student attainment of relevant knowledge and skills.

- *Facilities, equipment, technology, and materials:* This element addressed the alignment, appropriateness, and safety of the physical/material components of the program of study, including laboratories, classrooms, computers, industry specific equipment, and tools and supplies that support learning.

- *Prepared and effective program staff:* This element addressed the qualifications and professional development of program of study staff, including secondary CTE teachers, postsecondary CTE faculty, administrators, and other personnel.

- *Sequencing and articulation:* This element addressed the key components of the definition of a program of study and the articulation, coordination, and collaboration that supported programs of study, career pathways, and accelerated learning.

- *Standards-aligned and integrated curriculum:* This element addressed the development, implementation, and revision of the program of study curriculum, including the relevant knowledge and skills taught in the program and the standards on which they were based.

- *Student assessment:* This element addressed the types and quality of assessments used in the program of study, including the types of knowledge and skills that should be assessed, and assessments that led to recognized postsecondary credentials.

- *Student career development:* This element addressed strategies that helped students

gain career knowledge and engage in education and career planning and decision-making, including career counseling, career assessments, curricula that helped students learn about careers, information about educational opportunities and workforce trends, and job search information and placement services.

- *Work-based learning*: This element addressed the delivery of a continuum of work-based learning involving sustained, meaningful interactions with industry or community professionals that foster in-depth, firsthand engagement with the tasks required in a given career field. Experiences might be delivered in workplaces, in the community, at educational institutions, and/or virtually, as appropriate, and included a range of activities such as workplace tours, job shadowing, school-based enterprises, internships, and apprenticeships.

Work-Based Learning

If young people were to invest in the future for which the world of work was essential, experiencing learning opportunities in the world of work was also essential. Building the professional skills, “soft skills,” or “transportable skills” of students required authentic experience either through simulation of events or actual work-place learning. Developed work experiences were a passport to future opportunities. Students pursuing the world of work through employment, apprenticeships, internships, training programs, or student enterprise options allowed could develop a resume of professional skills and a portfolio with a distinct competitive advantage (Hull, 2005; Schwartz, 2014; Meeder, 2016; Perna, 2018). “The earlier that students can see subjects applied in a real-world work environment, the more serious and dedicated they will be about their studies” (Bertram, 2017). The importance of work-based learning became more essential when one examined the need for high-quality work experience combined with some postsecondary training just to gain an entry-level career. CTE programs providing

technical training and work experiences were an essential first steps. A renewed commitment to youth employment could be found in both Perkins V and WIOA legislation. The Georgetown Center for Education and Workforce dedicated numerous studies around the matter, and director Anthony Carnevale explained that youth employment and federal support, which had been declining for more than two decades, narrowed the opportunities for applied learning environments. “The demand for both specific and general skills in entry-level jobs was rising just as opportunities to develop those skills were disappearing” (Hoffman & Schwartz, 2017). Perkins V, along with additional workforce legislations, sought to align and leverage a more systemic approach from secondary, to postsecondary, to workforce. The reform needed around these systems to help people navigate between college and careers could be seen in its first stages through the Perkins V changes.

CTE programs historically have varied in how they interacted with employers and ensured economic competitiveness as a goal. Those programs more closely aligned with the employers showcasing firmer standards for admissions while diminishing educational equity. Open-enrollment programs were more student centered and focused on the students’ desire to learn skills of choice, and they tended to strive for equity without providing for employers’ needs. Increasingly, a model for open-enrollment focused programs of study has been emerging from the newest legislation.

Many of today’s CTE initiatives attempt to offer access to middle-skill jobs in high-wage, high-demand fields. The most promising programs provide clearly articulated pathways from high school through postsecondary education, stackable credentials pave the way for career advancement, and work-based learning experiences. (Rosen & Molina, 2019, p. 1)

CTE programs provided students of all ages with academic and technical skills, knowledge, and training necessary to find success in future careers. CTE prepared learners by

providing context to academic content through hands-on opportunities. CTE programs included aligned course offerings, career-focused meaningful experiences, work-based learning opportunities, and school-employer partnerships. Each of these components was designed to engage students in skill building, develop successful transitions to postsecondary opportunities, earn industry-based credentials, and/or step right into a career. Competition for jobs and economic growth in the United States contributed to an increase in CTE enrollment for secondary schools. Specifically, Texas CTE enrollment expanded 170% between 1996 and 2006, marking the increased importance of CTE programs as a component of secondary education (Career Classes Make a Comeback, 2007). Within the enrollment increase, career content, pathways, and programs of study have been developed to meet the variety of needs for industry sectors. Focusing on sustainable opportunities for work beyond high school, CTE programs have now become positive matches between students, schools, and the world of work (Rosen, 2017).

Equity

By 2018, globalization continued to reshape the U.S. landscape, and coupled with a more diverse population and the rapidly evolving labor market, adjusting to changes has been difficult for the education system. In previous generations, high school students were sorted by “college bound” or “career bound.” (Ainsworth, 2005; Ansalone, 2006; Rojewski, 2013). The need for technical understanding and high-skilled labor increased, yet continually CTE programs had shown a disproportionate over enrollment of “learners of color, low-income learners, female, and learners with disabilities into low-quality, job-focused programs” (Advance CTE, 2018 p. 3).

For the first time, CTE legislation required a comprehensive local needs assessment (CLNA) that addressed equity across population, gender, race, socioeconomic status, exceptionalism (ability group), and academic achievement by program of study enrollment. The

change to Perkins V legislation served as a support and expectation that all students would have access to high-quality CTE programs that led to a family-sustaining livable wage. While CTE legislation of the past had specifically sought to dismantle inequities, the educational system had served to hold individuals in place by long allowing systems of implicit bias to influence national and state policy along with local decision making (Advance CTE, 2019). This area was where conflicting research arose around understanding data driven decisions and treating populations of students as a fixed singular data point of race, ability, economics, and gender. In addition, recent studies have shown that these data points continued to be conflicting and misleading, as researchers lacked consistency in or use of proper race/ethnicity and gender reporting in CTE (Rojewski, 2013).

Perkins V sought to hold accountable state participation of underrepresented populations in occupations that were deemed high-wage and high-skilled. This laser focus on “special populations” included data disaggregation by individuals with disabilities, individuals from economically disadvantaged families, including low-income youth and adults, individuals preparing for non-traditional fields, single parents, including single pregnant women, out-of-workforce individuals, English learners, homeless individuals, youth that were in or have aged out of the foster care system, and youth whose parent was a member of the armed services (Perkins V, 2018). These data points in the name of equity were supported by research that the inclusion of all students was essential to prevent the “erosion of opportunity” (Smith & Frey, 2017), however, little research existed from previous legislation on the improvement of student opportunities in access based on these tracking measures.

When examining the specificity of non-traditional fields, Perkins V reemphasized the racial and gender participation based on dominance of one demographic in a job-related field. A

recent longitudinal study showed female-dominated clusters such as education and human services were still female dominated and more male students were enrolled in STEM, architecture, and law. In addition, a study of a national 2010 cohort of CTE participants showed students from almost all racial/ethnic minorities were less likely to participate in STEM programs than white students, even when controlling for the variables of the socio-economic status of students (Chen, et al., 2020).

Beyond gender, race/ethnicity, and socioeconomic status, the work of CTE programs needed to be more inclusive than mere enrollment and academic performance measures of special populations, although inclusive student placement was the first step. Equity research had helped us understand that to provide the programmatic expectations of a high-quality CTE system, additional measures must ensure movement from equality to equity (Fry, 2017). Nonetheless, an analysis of CTE research practices showed an inconsistency in and amongst researchers to adequately describe demographic characteristics to establish meaningfulness around generalizing CTE participants (Rojewski & Xing, 2013).

Strong systems that build equity also realized the intersectionality of identity. Previous provisions of Perkins V encouraged all learners to pursue opportunities for working and learning both technically and academically. For a culture of equity to occur in the CTE classroom, there was a need for understanding that students have “complex layered lives and affiliates across religion, geography, and family.” (Smith, Frey, 2017 p. 16) They were more than a single point of race, gender, sexual orientation, and ability group (Smith, Frey, 2017; Gorski, 2018). Very rarely had reform measures considered a student’s culture as an asset, but rather a disadvantage to be fixed (Lindsey, 2017, p. 27) Although Perkins V intended to hold states accountable to perceived access through data points, a more complex variation of equity and access stories has

occurred in classrooms across the country. The inclusion of the various populations for accountability through programs of study began to shed light on what was not known. This awareness was the first step in creating an entry-level CLNA and declaring strategies to address those needs through funding and goals. The accountability measures provided the first glimpses of “acts of omission which can inform a local plan to values and behaviors that intentionally marginalize students” (Lindsey, 2017, p. 34.). Nevertheless, intentionally addressing equity and understanding cultures of classism, racism, sexism, and the marginalization of students within the classroom required a deeper systemic look.

Throughout the recommendations of Perkins V, as it applied to students with (dis)abilities (SWD), themes emerged around compliance, accountability, communication, and access. At no point was there a call for educators to examine their own bias, prevent tracking, nor scrutinize the local policies around inclusivity; all of which were the foundation of equity in school reform. Seeking equity for SWD meant addressing needs that were even more complex in the larger society. Research revealed that students with disabilities were three times more likely to experience homelessness than their peers. In 2015, more than one-fifth of people experiencing poverty were children under the age of 18. From 2014-2015, children experiencing homelessness without an adult increased by 20% (Solari, et al., 2016). Each of these measures was now part of an accountability grouping for Perkins legislation, however CTE educators and administrators needed to arm themselves with an increase in professional learning to tackle their own biases in the classroom to ensure students experiencing these marginalizing situations have increased access to high quality programs. Those programs would be inclusive and required teachers that were focused on increasing opportunities for all students to succeed. Identifying and dismantling

historic barriers were first steps in reconstructing a system that supported all learners (Advance CTE, 2017).

Perkins V and the State of Texas

A comprehensive state plan for Texas career and technical education with regards to Perkins V compliance was submitted on March 23, 2020, from the Division of College, Career, and Military Preparedness (CCMP) and sent to the Governor’s Office on March 25th of that same year. The plan writing team was comprised of members from the Texas Education Agency (TEA), Texas Workforce Commission (TWC), Texas Higher Education Coordinating Board (THECB), and Texas Workforce Investment Council (TWIC). Frameworks and research already existed amongst each of these partners, but it was a matter of aligning each of the member’s priorities while gathering information that was of strategic significance to the state of Texas.

Per the executive summary, the key areas of focus included:

- Alignment of CTE programs with defined high wage and high skill occupations in Texas
- Provision of funding and opportunities for students to earn credentials (industry-based certifications, level I and II certificates, associate and bachelor’s degree)
- Reduction in the burden of CTE reporting structures at the district level
- Provide opportunities for work-based learning in rural, suburban, and urban settings
- Construction, support, and promotion of meaningful and effective CTE cross-sector collaboration in Texas across secondary, postsecondary, and the workforce
- Insurance of equitable access to postsecondary CTE programs and credentials through multiple on and off-ramps for all students, with particular attention to Perkins special populations

The division of CCMP goals for young Texans in the education system aimed to open access to “high-quality pathways” that led to postsecondary placement and careers. The goal aligned to have 65% of Texas public high school students be enrolled in postsecondary education by 2030.

Throughout the Perkins planning, the development of a tri-agency surfaced, whereas TEA, THECB, and TWS formed a system that leveraged the Perkins and additional state funding across all programs in support of the 60x30TX and the state’s strategic plan for education.

The tri-agency taskforce was charged with identifying high-growth, high-wage career opportunities in Texas. After identifying the careers, the agency worked with a variety of business, industry, and education partners to identify and develop pathways for training in these career areas. Once careers were identified, the taskforce brought industry and education together to determine a program of study, course alignment, skill attainment, and valuable industry-based credentials. This mapping of an occupation and the skills and credentials necessary for success lay alongside real-time labor market data for a more accurate account of the skilled workforce needs of an area (Hoffman & Schwartz, 2017; TEA, CCMP 2020).

Perkins V provisions along with a variety of proponents for CTE insisted that all programs of study should culminate in a work-based learning experience. “The most promising programs provide clearly articulated pathways from high school through postsecondary education, stackable credentials pave the way for career advancement, and work-based learning experiences” (Rosen & Molina, 2019, p.1). Looking at the Learning for Careers model of work-based learning, TEA developed a system that allowed students to see a program of study as a journey through the phases of work and learning. From awareness to exploration to learning through work, young Texans experienced the world of work in a variety of supported ways.

TWIC

The Workforce Investment Act, Texas Government Code Title 10, Subtitle G, Chapter 2308 provided for the establishment of the Texas Workforce Investment Council to be comprised of three voting members of education (each of whom must be from local public education, public

postsecondary education, and vocational education, respectively.). The committee also included five voting members who represented organized labor, five voting members from business and industry, one voting member who represented community-based organizations, and five ex officio voting members that included the commissioner of education, commissioner of higher education, commissioner of human services, the executive director of the Texas Department of Economic Development, and the executive director of the Texas Workforce Commission (Government Code, Texas Workforce Investment Council)

The primary role of TWIC was to promote development and education of a skilled workforce, advocate for system integration, and advise the governor on the development of local workforce systems. The council existed in part as a response to the Workforce Innovation and Opportunity Act (WIOA), as it looked at workforce needs, reviewed services and funding, developed standards and measures for workforce systems, and evaluated and conducted broad-based planning in the state of Texas. Historically, TWIC has produced reports and made recommendations to the governor that considered how one program within the state impacted another, their various intersections, and the overall impact of one program on the workforce system. The findings have historically influenced reporting and responses of various agencies in Texas. The influence of TWIC could be seen in the Tri-Agency report in November 2016, “Prosperity Requires Being Bold: Integrating Education and the Workforce for a Bright Texas Future Texas Education Agency,” which was directly referenced in the Texas Education Agency state plan for implementing Perkins V. Many of the overlapping goals described the necessity for alignment and influence in the workforce system, especially within credentialing, as well as CTE offerings.

The Texas Workforce System Strategic Plan for FY 2016-2023 established four primary

goals:

- 1.) Focused on employers
- 2.) Engaged in partnerships
- 3.) Aligned system elements
- 4.) Improved and integrate programs

The focus on the plan was to integrate the eight state agencies that make up the state's workforce system and unite them around common strategies that could be realized in individual plans without duplicating strategic planning or budgeting systems. The eight agencies included: the Texas Department of Criminal Justice, Texas Education Agency, Health and Human Services Commission, Texas Higher Education Coordinating Board, Texas Juvenile Justice Department, Office of Economic Development and Tourism, Texas Veterans Commission, and the Texas Workforce Commission. Each of these played an integral role in growing and sustaining a competitive workforce. The council highlighted the need for educational programs of study, adult education, middle-skill worker definitions, industry-based certifications for Texas workers, demand-driven programs and services, and education system coordination alignment. As a result, the Texas Education Agency was greatly impacted in terms of CTE, and these statewide recommendations influenced part of the Perkins V plan along with federal expectations around accountability and systemization (Hoffman & Schwartz, 2017; Tri-Agency Report, 2016; TWIC, 2016).

The skills gap created in Texas could be partially attributed to a tight labor market. There has been continued job growth from the recession of 2011 through February of 2020, Yet, despite the growth in jobs and local population the Dallas federal reserve estimated that companies increasingly were finding it difficult to hire a skilled workforce. This limitation

adversely affected the working economy in terms of labor cost increases, decreased company growth, and stagnant employee retention (TWIC, 2019).

In November 2019, although there had been a decline in manufacturing and the energy sector in Texas, a sustained job growth in the service sectors including retail, travel, and leisure contributed to the state's overall employment growth. The Dallas Federal Reserve's service sector survey for November showed promising confidence in the Texas economy prior to COVID-19. Each of these factors were part of the positive strategic evaluation from the Texas Workforce Investment Council and the resiliency of the Texas Workforce (Dallas Federal Reserve, November 2019).

CHAPTER 3

METHOD

This chapter includes each of the elements within the methodology of this study: the research design explanation, population and sample, sampling procedures, instrumentation, data collection procedures, data analysis, and limitations. Information is presented within the research design visual that further explained the methodology. Each of these elements worked in congruence to explain the means in which the research study findings responded to the research questions.

The purpose of this study was to examine the relationship between CTE programs in north central Texas provided to high school age students and the Labor Market Indexes (LMI) of the same given area. The study determined whether CTE programs that received financial support through federal Perkins V grant spending offered programs of study that were aligned with the needs of the local labor market for high-wage, high-demand jobs. All programs measured were part of the Texas Education Agency CTE programming and received Carl D. Perkins grant funding for the 2018-2019 school year.

The following research questions concerning CTE programs in north central Texas were used to guide the study:

Q1: To what extent are career and technical education programs offered in secondary schools in north central Texas aligned with current labor market needs?

Q2: Does a school district that receives a larger concentration of Perkins grant funding per capita have a greater propensity for program of study alignment to local labor markets?

Q3: Is there a correlation between state and federal spending for Career and Technical education of a particular local education agency and program alignment with current labor

market data based on district TEA, NCES designation?

Research Design

Archival data and a quantitative approach to labor market indexes were used to explore the correlation between program of study offerings in CTE programs in the Texas Education Agency Education Service Centers (ESC) Regions X and XI and Labor Market Indexes (LMI) for North Central Texas Regions 4, 5, and 6. Correlational research methodology was used to identify relationships among schools which received federal funding for CTE, known as the Carl D. Perkins Title I Part C. federal grant amounts, as well as alignment with programs of study that were reflective of the local LMI for Region 4,5, and 6. The study was considered quantitative since it used archival data. The data points that were measured included concentration of local labor markets, aggregate spending of each districts CTE funding as it was coded to Program Intent Code 22 (PIC 22) (a state funding code for CTE expenditures), and each district's final Perkins Allotment amounts which were designated solely for career and technical education. The use of funding as it applied to programs of study was in direct alignment with the newest Perkins V legislation and the expectation of State programs to use

State, regional, or local labor market data to determine alignment of eligible recipients' programs of study to the need of the State, regional, or local economy, including in-demand sectors and occupations identified by the State board, and to align career and technical education with such needs as appropriate. (Hyslop, 2018, p. 80)

Liang and Zeger (1993) explained that a regression analysis' objective described the "relationship of a response with explanatory variables" (p. 43). For this study, the assumption of the regression analysis was that the labor market index was statistically independent of the CTE programming offered in local school districts. Moreover, those same programs offered were spending federal funding on programming that was insignificant to the labor market indexes. This research method required analyzing quantitative data sets in three different forms.

Description of Data

Labor Market Indexes used the Borderplex Workforce Development Regional Labor market information for 2016-2026 for both ESC Region 10 and 11. The LMI territory for the combined North Central Texas Region included: Workforce Development Area 4 (North Central), Workforce Development Area 5 (Tarrant County), and Workforce Development Area 6 (Dallas). Each LMI aligned with a current State Career Cluster, program of study, and occupational title and provided the growth and wage correlations.

Comprehensive Annual Financial Report (CAFR) was used for each local education agency within the 16 counties included in Region X and XI education service centers that make up North Central Texas. The data pulled from this report included all spending categorized to program intent code 22. A program intent code was used in financial accounting and reporting through the Texas Education Agency to account for the “cost of instruction and other services that were directed toward a particular need of a specific set of students” (FASRG, 2019. p. 220).

Perkins V Title I Part C. Allotment Amounts for fiscal year 2019 were used.

Participants

The participants for this study included 157 school districts in varying sizes located within the 16 counties for the greater North Central Texas region. Although there were additional alternative training facilities such as Job Corps, juvenile justice programs, displaced workers, and charter schools, this study included the public-school districts who were benefactors to the Perkin V plan. As part of this plan, each of these districts were required to comply with federal grant requirements and report their performance with the Texas Education Agency. I chose to examine comprehensive high school CTE programs within Region X and XI education service centers. The programs of study were declared by each school district from a list of 59 possible

options for the fall snapshot reporting date of October 30, 2019.

The criteria for individual participants included the following:

- 1.) Local Education Agency (LEA) were located in one of the following counties: Wise, Denton, Collin, Hunt, Palo Pinto, Parker, Tarrant, Dallas, Rockwall, Kaufman, Erath, Hood, Johnson, Ellis, Navarro, or Somervell.
- 2.) In addition, the same LEA must be designated to either Region X or XI Education Service Center (ESC).
- 3.) In addition, the same LEA must be regionally situated in the Workforce Development Area (WDA) Regions of 4, 5, or 6.

For a participant to be examined, they had to meet all three of the required criteria. Some school districts might be in the 16 counties but could be excluded from either workforce development or service center data. The research conducting this study chose to focus only on those local education agencies that met all three criterion and were non-charter public schools that offered at least one CTE Program of Study.

Variables Examined

There were two different analyses that occurred to create the correlation analysis for the final research question. The first analysis was that of an individual LEA, the CTE programs of study offered, and how they aligned to the Local Market Indexes for Workforce Development Areas 4, 5, and 6. The dependent variable of the study or outcome was the number of programs offered across all the collective school districts of north central Texas that also had high wage, high demand labor market indicators. Program offerings reflected the labor market opportunities; however, concentration of alignment was not interdependent. After reviewing the region in totality, assessing each individual local education agency, and creating an alignment factor that was ordinal in its design, LEA programs of study were individually scored as either highly aligned with labor market data or minimally aligned. This categorization was for my benefit and

did not contribute to the overall final questions of the study. The second analysis examined the categorical independent variables, which were the amount of financial investment applied by a particular local education agency through Perkins V, Title I, Part C. and through local required spending within Program Intent Code 22 for fiscal year 2019.

Instrumentation

The instrumentation for this research began with reliable archival data sets found in the Public Education Information Management System (PEIMS), which “encompassed all data requested and received by TEA about public education, including student demographic and academic performance, personnel, financial, and organizational information” (TEA, 2020). Per Texas Administrative Code §109.23, a district must provide an annual financial and compliance report to TEA. The report must be annually audited by an independent auditor and reviewed by TEA for alignment within the Financial Accountability System Resource Guide (FASRG). The independent audit completed by a certified public accountant must certify the alignment with the Comprehensive Annual Financial Report (CAFR), spending and reporting for each LEA. This archived certified data were available publicly and were available through a variety of channels. For the research download, forecast analytics program 5Sight was used to download school program intent code spending PIC 22 for fiscal year 2019. This download of data was pulled directly from the public CAFR for each LEA in Texas.

The next archived data set came from the public entitlements page within the Texas Education Agency, located at (Texas Education Agency, 2019). This public site housed the 2018-2019 Perkins Final with Reallocation by LEA document that included all planning amounts for every Texas LEA for Perkins V, Title I., Part C. grants. The documents aligned with all Perkins grants located in the TEAL (Texas Education Agency Login) system that housed all

grant functions, reporting, individual, and district accountability data. This data reflected the amount of Perkins funding allotted to an individual school district as of July 2019, but neither confirmed nor denied if all planning amounts were spent in their totality. This Perkins funding was a direct reflection of the federal allotments of \$1.2 billion dollars in State formula grant funding to develop “more fully the academic knowledge and technical and employability skills of secondary and postsecondary education students who elected to enroll in CTE” (Perkins Collaborative Resource Network, 2019). The \$111,609,744 allotted to the State of Texas for fiscal year 2019 were then appropriated to each LEA through the planning amounts. These local planning amounts were part of formula funding that was based on Census Bureau population and poverty counts of individuals age 5-17.

The Workforce Development Areas archived Labor Market Indexes were created through the state with an independent economist who grouped occupation, compared media data from EMSI data (real-time labor market information that integrated economic, demographic, education, and job profile data) labor projections, Texas Workforce Commission data, local workforce boards targeted occupations, and the Bureau of Labor Statistics. Each WDA area reported for occupations, growth rates, and classifications as it related to programs of study and career cluster. The data were then then published to the Texas Education Agency career and technical education website and were required to be used by all school districts throughout Texas to complete a comprehensive local needs assessment (CLNA). The WDA reports were part of the TEA’s Perkins V plan to reinforce alignment between labor market data and statewide approved programs of study (Perkins V Plan, 2019 p. 22).

To establish a profile for each of the LEAs, the archived data were used and found in School Data District Type reporting for 2018-2019 available on the TEA website to describe the

distinction of each school district in one of the following categories: A: Major Urban, B: Major Suburban, C: Other-Central-City, D: Other-Central City Suburban, E: Independent Town, F: Non-Metropolitan: Fast Growing, G: Non-Metropolitan: Stable, or H: Rural. This distinction was added to the Excel data that included the declared regional programs of study by each LEA along with the reported CTE student enrollment. Table 1 illustrates the distribution of districts by type in the region who met qualifications of this study.

Table 1

Number of Texas School Districts in North Central Texas by District Type

| District Type | <i>n</i> | % |
|-------------------------------|----------|----|
| Major Urban | 3 | 2 |
| Major Suburban | 32 | 22 |
| Other-Central-City | 8 | 5 |
| Other-Central City Suburban | 41 | 28 |
| Independent Town | 9 | 6 |
| Non-Metropolitan Fast Growing | 11 | 7 |
| Non-Metropolitan Stable | 12 | 8 |
| Rural | 30 | 21 |

The final piece of archival data was derived from the CLNA and distributed to the region service centers. Each local education agency must declare the programs of study to be offered within their CTE programming annually. This information was also available in the PEIMS reporting at the state level. This report was used to determine which programs of study were offered at each local education agency came from the self-reporting document distributed by TEA. To ensure adequacy of the data set provided, reporting was provided by both TEA officials and Regional XI CTE officials.

Microsoft Excel was selected to build individual profiles for the regions, counties, and

local education agencies. These profiles included the school district’s name, ESC (educational service center), county of residence, workforce development area, Federal Perkins Allotment amount, CAFR spending attributed to PIC 22, number of programs of study offered, individual program of study ID numbers, and district overall enrollment available from the Texas Academic Performance Report (TAPR) 2018-2019, which was available on the TEA website. All TAPR information was certified annually by a local education agencies official, which included the superintendent and local school board. All data provided were part of public record, but this researcher owned the data design as well as the profile information used for the research analysis.

For each research question, archival data columns needed to be set and managed to organize the data logically for evaluation in SPSS.

Research Question 1 (Q1)

To what extent are career and technical education programs offered in secondary schools in north central Texas aligned with current labor market needs?

The archival data were examined, and index tables were created to categorize the 59 possible programs of study and how local education agencies declared that program of study available for their district (see Table 2).

Table 2

List of Statewide Programs of Study and the Number of Districts in North Central Texas that Offer that Program of Study

| Program of Study | <i>n</i> | Program of Study | <i>n</i> |
|-------------------------------------|----------|------------------------------------|----------|
| Accounting and Financial Services | 67 | Government & Public Administration | 11 |
| Advanced Manu & Machinery Mechanics | 30 | Graphic Design and Multimedia Arts | 96 |

(table continues)

| Program of Study | <i>n</i> | Program of Study | <i>n</i> |
|-------------------------------------|----------|-------------------------------------|----------|
| Agribusiness | 31 | Health and Wellness | 23 |
| Animal Science | 113 | Health Informatics | 23 |
| Applied Agricultural Engineering | 68 | Healthcare Diagnostics | 49 |
| Architectural Design | 36 | Healthcare Therapeutic | 62 |
| Automotive | 53 | HVAC and Sheet Metal | 16 |
| Aviation Maintenance | 14 | Information Technlgy Support & Svcs | 48 |
| Barbering | 3 | Interior Design | 18 |
| Bio-Medical Science | 20 | Law Enforcement | 62 |
| Business Management | 101 | Legal Studies | 24 |
| Carpentry | 30 | Lodging and Resort Management | 14 |
| Construction Mgt and Inspection | 17 | Manufacturing Technology | 19 |
| Cosmetology & Personal Care Svcs | 52 | Maritime | 2 |
| Culinary Arts | 90 | Marketing and Sales | 48 |
| Cybersecurity | 32 | Masonry | 4 |
| Diesel and Heavy Equipment | 10 | Medical Therapist | 17 |
| Digital Communications | 73 | Networking Systems | 38 |
| Distribution and Logistics | 6 | Nursing | 43 |
| Early Learning | 42 | Oil & Gas Exploration & Production | 1 |
| Electrical | 13 | Plant Science | 60 |
| Emergency Services | 28 | Plumbing and Pipefitting | 6 |
| Engineering | 75 | Programming & Software Development | 54 |
| Entrepreneurship | 47 | Refining and Chemical Processes | 3 |
| Environmental and Natural Resources | 19 | Renewable Energy | 7 |
| Exercise Science and Wellness | 12 | Teaching and Training | 75 |
| Family and Community Services | 57 | Travel, Tourism, and Attractions | 17 |
| Fashion Design | 19 | Web Development | 31 |
| Flight | 5 | Welding | 79 |
| Food and Science Technology | 13 | | |

For the 146 schools examined, all 59 programs of study were accounted for, with some with greater concentration. The State of Texas had additional program of study opportunities that

could be filed regionally, but for the purposes of this study the focus was solely on those declared statewide programs of study through the Texas Education Agency.

Research Questions 2 and 3

Q2: Does a school district that receives a larger concentration of Perkins grant funding per capita have a greater propensity for program of study alignment to local labor markets?

Q3: Is there a correlation between state and federal spending for Career and Technical education of a particular local education agency and program alignment with current labor market data based on district TEA, NCES designation?

The archival data were extensive, and a complete profile was created for all 146 participants. This included the following column headers for regression analysis to be uploaded into SPSS:

| District Type | Number of Programs offered | Perkins Funding Allotment | Local CTE Spending | Total CTE spending (Perkins + Local CTE) | District Secondary Enrollment | Total CTE Enrollment |
|---------------|----------------------------|---------------------------|--------------------|--|-------------------------------|----------------------|
|---------------|----------------------------|---------------------------|--------------------|--|-------------------------------|----------------------|

Both Questions 2 and 3 of the study required additional transformations of the data which included a reduction to the fourth power in Perkins funding allotment, local CTE spending and total CTE spending. This reduction resulted in three additional columns in the upload of SPSS. This alternative approach was necessary for data validation due to skewness.

Data Collection Procedures

The data collection process began by creating an archival database with the variety of data to be analyzed. Three of the four archival data reports were used were from public reporting documents found either through the state reporting websites or through individual downloads within 5Sight that also pulled from the state reporting website. The 5sight aggregate tool was selected to create this report, as it collected all CAFR information in a single report without

having to pull all LEA data individually from the state website. This process allowed accuracy and cross-referenced documents while maximizing efficiency for collecting such large comprehensive data sets.

One set of data was received from the Texas Education Agency director for career and technical education upon request, and was confirmed from a secondary source, the Region XI CTE administrator. This data included the self-reporting of individual programs of study through PEIMS submissions to the TEA by way of individual school districts in Region X and XI educational service center. This region geographically corresponded with the 16 counties in North Central Texas. The data necessary for this study did not require identifying information about individuals within an organization.

Figure 1

Flowchart of Timeline for Archival Data Collection



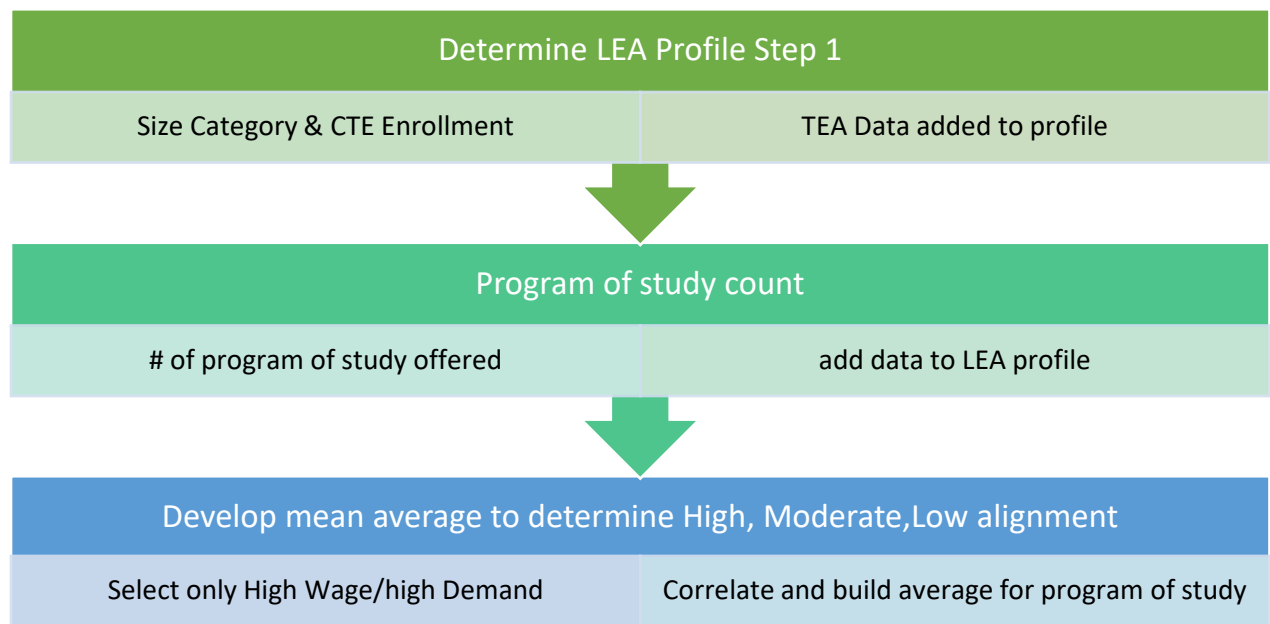
Data Analysis

The first level of data analysis was to build a profile for each of the local education agencies in North Central Texas that were included in this study. Examining all LEA's and their

program of study offerings. The LEAs were sorted by NCES categories. Each profile included district enrollment, CTE enrollment, Perkins allotment spending, state CTE allotment spending, and the NCES/TEA category. Each LEA was categorized based on a predetermined set of values calculated by TEA. Districts were classified into eight community types based on their current enrollment, growth in enrollment from previous years, economic status, and their proximity to urban areas. This allowed a comparison of school districts in the same geographic region but created subcategories based on school size as well as future school size. It stood to reason fully developed small school districts did not offer as many CTE programs of study as large urban districts in the same ESC, however, this difference did not determine their potential for offering a greater concentration of programs aligned to local labor markets.

Figure 2

Flowchart of Assessing, Categorizing, and Organizing Archival Data



Limitations

The delimitations of this study were focused on local education agencies in North Central Texas that offer CTE programs of study within the Education Service Centers Region X and XI,

and Workforce Data Areas 4, 5, and 6. Within the delimitations, per pupil spending was avoided as the calculation was misaligned in that CTE program funding was provided by student/teacher contact hours, not on an individual student enrollment basis. Students would amass multiple contact hours in each period and therefore count for multiple students within a program FTE. Additional delimitations did not evaluate the overall operating budget of individual LEA but only those locally coded to Program Intent Code 22 through the CAFR. The limitations within this study required each reporting agency and local education agency to accurately describe through annual PEIMS reporting their expenditures for all functions with PIC 22 as well as their self-report programs of study in PEIMS report PDM-116-007. Additional limitations around Labor Market Indexes occurred beyond the snapshot of time for 2019, as the data were collected prior to the global COVID-19 pandemic. Labor markets struggled to recover more than eight months after the onset of COVID-19 shutdowns and only made incremental gains in a variety of sectors. Additional limitations included a change of national leadership in a highly contested presidential election. Further outcomes for this study would need to consider the federal changes designed from these world events.

Significance of the Study

This study added to the body of literature around CTE within the secondary public education system and its role in providing opportunities to impact local labor markets. This study contributed to the argument that secondary CTE programs existed at the high school level in great alignment with the local demand for jobs in workforce development. Further findings showed the fiscal investment at both the state and federal level have had significant return-on-investment with program alignment as an outcome. Educational administrators and policymakers alike would benefit from this study, as it affirmed the investments made by a variety of

stakeholders and the need for great labor market alignment for employers in Texas. All educational stakeholders should learn from the processes created in offering a program of study within a given region and how to align future offerings within secondary education and local labor markets.

Threats to Validity

The primary threat to validity was a concern over the educational landscape within public education during the COVID-19 pandemic, as well as the shift in national labor markets due to subsequent lockdowns and closures. Travel, tourism, and retail labor markets each bore significant industry changes after the snapshot time of this study. Future studies should include recovery efforts within labor market data.

Ethical Considerations

Individual school district data, defined as in the number of programs of study offered, should seek to do no harm by way of masking district IDs and using the TEA district profile data. Protecting anonymity and confidentiality were important in creating individual school profiles. Another essential consideration was using all function funding expenditures to program intent code PIC 22 for each school district and not excluding any function spending so as not to deceive the full cost and scope of the program.

Summary

The goal of this chapter was to outline the method used to research and answer the questions posed. A detailed description of the research design, instrumentation, the various data sources, and collection methods were provided to add strength around the methodology of a regression analysis. This chapter built the discussion around the strength of the relationship

between program alignment, labor markets, and local education agency expenditures for the given program. Chapter four provided a demonstration of this correlation and provided the results of the study.

CHAPTER 4

FINDINGS

Chapter 4 propounds the findings of the study to analyze the effects of Perkins V legislation as it related to career and technical education programs of study in a particular geographical region. The study examined in detail the independent variable combinations of correlating the number of labor market index aligned programs of study offered in North Central Texas, and program spending at both the federal and state levels. This chapter is organized around the three questions posed within the study. This chapter provides findings on both the binary question of program alignment and the regression analysis of aligned program offerings with federal spending. And finally, this chapter describes the moderation analysis conducted where the number of labor market aligned programs of study and total program spending was moderated by CTE student enrollment.

The analysis of archival data examined the program reporting provided by the Texas Education Agency. Upon extensive examination of all data the binary question asked in this initial research was answered.

Research Question 1

To what extent are career and technical education programs offered in secondary schools in north central Texas aligned with current labor market needs?

Of the 146 schools who met the initial criteria for evaluation of this study, all 146 offered at least two statewide programs of study that were aligned to the local labor markets for high-wage/ high-growth jobs. The Program Guidelines 2021-2022 Perkins V: Strengthening Career and Technical Education for the 21st Century required each local education agency that had 500 students or more would offer at least one program of study that was aligned with local labor market indexes (p.12). For this research all programs met this criterion. As a policy for

placement the Perkins V Act has placed this stipulation, yet all programs who (Texas Education Agency, 2021) received federal dollars were complying. This might have been a result of previous legislation that over time adjusted to partially align with local labor markets (Stipanovic, Lewis, & Stringfield, 2012).

Table 3 depicts the top 15 programs of study offered within the region based on the annual average employment projections for 2026. As well it included the annual openings and the number of districts within the region that offered that program of study. Unfortunately, the archival data available did not include the actual student enrollment in each program of study. Examining the opportunity for programs of study within the region, required combining programs of study annual average employment projects and annual openings for the corresponding programs of study for each of the labor markets indexes 4, 5, and 6 that were examined. The annual average employment number depicted was the sum of Labor Market Regions 4, 5, and 6 job opportunities in a particular program of study that met the high wage/high growth indicator in the Labor Market Index. Annual openings depicted the number of annual openings in the Labor Market Region 4, 5, and 6 for each individual program of study that aligned with a high wage/high growth opportunity. The number of programs offered is the sum of both Region X and Region XI education service center program of study reports by school district. While all sixty statewide programs of study were offered in the region and had employment opportunities, the projected employment, and annual openings per program of study varied greatly.

Table 4 depicts the top twenty programs of studies offered across Region X and Region XI educational service centers. The number of districts offering the program of study was sorted within the table in descending order from greatest concentration of program of study offerings to

least for the top 20 programs. The annual openings depicted in Table 4 differed from that of Table 3 as the annual openings represented was the total sum of Labor Market Regions 4, 5, and 6 annual openings for all wage and growth opportunities. This included openings that are both low wage and low growth. Table 4 continues to illustrate the differences between the number of programs of study offered and the employment opportunities annually. Nevertheless, the programs offered to the more than 362,000 CTE students in the area were indeed aligned with local labor market indexes in Regions 4, 5, and 6 prior to Perkins V legislation and the development of the Texas state plan for CTE.

Table 3

Distribution of the Top 15 Programs of Study by Estimated Annual Average Employment by 2026 for High Wage High Demand Occupations

| Program of Study | Est Annual Avg Emp 2026 | Annual Openings | Number of Programs Offered |
|---|-------------------------|-----------------|----------------------------|
| Business Management & Entrepreneurship | 86194 | 7951 | 101 |
| Nursing Science | 85889 | 5998 | 46 |
| Accounting and Financial Services | 53978 | 5091 | 67 |
| Information Technology | 53632 | 4304 | 48 |
| Renewable Energy | 27777 | 2957 | 7 |
| Early Learning | 29933 | 2571 | 42 |
| Web Development | 29324 | 2413 | 31 |
| Marketing & Sales | 20957 | 2252 | 48 |
| Teaching & Training | 24713 | 2069 | 75 |
| Electrical | 15859 | 1871 | 13 |
| Plumbing & Pipefitting | 13997 | 1619 | 6 |
| Automotive, Diesel, Heavy Equipment | 11853 | 1144 | 53 |
| Law Enforcement | 9084 | 670 | 62 |
| HVAC & Sheet Metal | 5625 | 592 | 16 |
| Programming & Software | 7946 | 590 | 54 |
| Architectural Design & Construction Mgmt. | 7159 | 561 | 36 |
| Legal Studies | 4579 | 500 | 24 |

Table 4

Sum of Program of Study Offerings in Region X and Region XI ESC School Districts and the Total Annual Openings for All Growth and All Wage Categories

| Program of Study | Districts Offering (n) | Annual Openings |
|------------------------------------|------------------------|-----------------|
| Animal Science | 113 | 151 |
| Business Management | 101 | 7951 |
| Graphic Design and Multimedia Arts | 96 | 821 |
| Culinary Arts | 90 | 5753 |
| Welding | 79 | 1674 |
| Engineering | 75 | 2324 |
| Teaching and Training | 75 | 3405 |
| Digital Communications | 73 | 338 |
| Applied Agricultural Engineering | 68 | 107 |
| Accounting and Financial Services | 67 | 12,440 |
| Healthcare Therapeutic | 62 | 8122 |
| Law Enforcement | 62 | 2456 |
| Plant Science | 60 | 483 |
| Family and Community Services | 57 | 303 |
| Programming & Software Development | 54 | 1646 |
| Automotive | 53 | 4164 |
| Healthcare Diagnostics | 49 | 2540 |
| Information Technology | 48 | 3863 |
| Marketing and Sales | 48 | 13436 |
| Entrepreneurship | 47 | 1378 |

Next, I examined the correlation between Perkins’ funding provided by the Federal Government and the number of programs offered that aligned with local labor markets. Regression analysis was executed for the 146 school districts which qualified for this description of having both aligned programs and receiving federal Perkins’s dollars.

Research Question 2

Does a school district that receives a larger concentration of Perkins grant funding per capita have a greater propensity for program of study alignment to local labor markets?

When examining these independent variables through a regression analysis using the amount of Perkins grant funding as the independent variable and the number of programs of study as the dependent value, it was determined there was statistical significance at $<.001$ in this alignment when examining all 146 schools as a group (Table 5). A regression analysis allowed me to evaluate how the amount of Perkins spending affects the number of programs of study offered by a given local education agency. A regression was chosen over a correlation since a regression would establish how Perkins funding would cause the number of programs of study to change in order to better depict the functional relationship of the two variables.

The output values shown in Table 5 depict the actual analysis of the regression completed in SPSS. In this model the number of programs of study was the dependent variable, and the amount of Perkins spending was the independent variable generated a significance value of $<.001$.

Table 5

Output Values when Running a Regression Analysis of Number of Programs of Study Offered and Perkins Federal Spending

| Model | Sum of Squares | Df | Mean Square | F | Sig. |
|------------|----------------|-----|-------------|--------|-----------|
| Regression | 9583.684 | 1 | 9583.684 | 146.12 | $<.001^b$ |
| Residual | 9444.487 | 144 | 65.587 | | |
| Total | 19028.171 | 145 | | | |

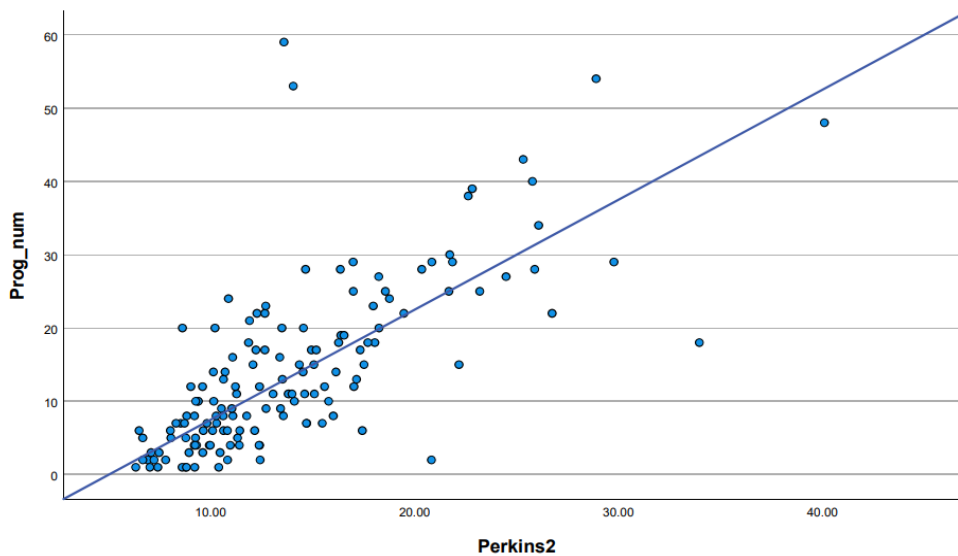
^aDependent Variable: Program Number. ^bPredictors (Constant), Perkins

In Figure 3, each dot represented a qualified local education agency that had at least one program of study. The greater the Perkins spending, the further to the right the dots moved. The more aligned programs of studies offered the higher the dot appeared on the chart. There were outliers both above and below the line. The scatterplot depicted a positive relationship with

Perkins2 (X) and Prog Num (Y) since the pattern moved uphill from left to right. As Perkins spending increased the number of programs offered also increased.

Figure 3

Association between Number of Labor Market Aligned Programs of Study Offered and Perkins Federal Spending



School districts were being regulated through policy compliance with the new Federal Perkins act. Part of that compliance requires declaring the number of programs of study that were offered by a local education agency in alignment with local labor markets. Those programs that were compliant did receive federal Perkins dollars, however funding was not allotted based on the number of programs offered. Nevertheless, a regression analysis allowed me to determine the relationship between the amount of funding provided through Perkins' dollars and the number of programs of study offered. This prediction of trends showed a school district which received a greater concentration of Perkins funding could be expected to offer more programs of study.

Finally, I sought to evaluate at a deeper level federal and state spending along with the national designations provided around school size and location as a possible correlation analysis. The correlation analysis on question three of this study was devised by completing a regression

analysis and found extremely skewed data as there was extreme variation within groups. This led to a reevaluation of the data elements and construction of a moderation analysis using CTE enrollment data as the moderator since CTE enrollment most closely mirrored the factor around school size.

Research Question 3

Is there a correlation between state and federal spending for Career and Technical education of a particular local education agency and program alignment with current labor market data based on district TEA, NCES designation?

School district size was a key factor in the designation of NCES groupings. When examining impact, 362,417 students participated in CTE programs across the 146 districts in the school year 2018-2019. The district size and enrollment became factors to deepen the research in question three of the study. The CTE enrollment for each of these districts were available and used to complete later analysis.

Total CTE spending was calculated using the sum of Perkins V allotment and the reported state spending of each local districts designated PIC 22 career and technical education allotment. This total spending was an independent variable and the number of aligned programs offered in each school district served as the factor. Each analysis was run by qualifying sub-groups created from the National Center for Educational Statistics. Table 6 depicts the breakdown of each of these sub-groups. This breakdown included the number of districts within north central Texas which had that individual designation. Alongside the number of districts was the range of programs of study's offered by the corresponding group of districts.

The data examined showed no statistical significance within a singular group such as major urban, major suburban, independent town, other central city, other central city suburban, non-metropolitan fast growing, non-metropolitan stable and rural. What it did find was a wide

range of program offerings within the sub-groups. Upon further examination and after working with a consultant in the Office of Research Consulting at the University of North Texas, another adjustment to this analysis was necessary.

Table 6

Sub-Groups of Districts with Range of Programs and Total Districts in North Central Texas

| NCES District Type | Districts (<i>n</i>) | Range of programs (<i>n</i>) |
|------------------------------|---------------------------|-----------------------------------|
| Major Urban | 3 | 18-48 |
| Major Suburban | 32 | 6-54 |
| Other Central City | 7 | 10-30 |
| Other Central City Suburban | 24 | 3-59 |
| Independent Town | 5 | 5-16 |
| Non-Metropolitan Stable | 16 | 5-21 |
| Non-Metropolitan Fast Growth | 11 | 1-17 |
| Rural | 30 | 2-20 |

The next analysis used a regression analysis for each group that used total spending for CTE programs which was the sum of both Perkins allotment and state funding (Perkins allotment + 199 local spending = total CTE spending) as the independent variable and the number of programs offered as the dependent variable. Upon further evaluation, a reduction in the size of financial data (total CTE spending) to one fourth was necessary. The histogram of the original regression produced a display of negatively skewed data with a left tail. The direction needed to be more reflective of the dataset. The square root to the power of four allowed for transformation of the factor of total CTE spending. This change reduced the variation in the dataset. Such a reduction of variability offered a more precise estimate for the population of the sample and decreased the margin of error. This range of data provided a better fit as well as increased the interpretability of the model.

A moderation analysis was chosen. The moderator “variable that affects the direction and/or strength of the relation between an independent or predictor variable and a dependent variable” (Baron & Kenny, 1986, p. 1174). This analysis was used to determine if a relationship existed between the number of programs of study offered by a local education agency and CTE spending; while being moderated by a third variable which was total CTE enrollment. This approach was necessary as all other evaluations had shown that by analyzing programs by the NCES descriptor only, increased variation between groups.

Initial research already determined there was a relationship between the amount of funding spent in career and technical education and the number of programs offered that aligned with local labor markets. Therefore, the moderation analysis was essential in determining where a school districts program enrollment changed the relationship between program spending and the number of programs offered. As with a linear regression, the dependent variable in this case was the number of programs of study offered. The independent variable was the transformed variable of CTE spending to the $\frac{1}{4}$ power and the moderator was the total CTE program enrollment of each given district. This presented the question of whether using the total CTE spending with CTE program enrollment created a problem since for a moderation to be effective multicollinearity could not be present. This apprehension was in large part due to the nature of how state funding for CTE was calculated, which was based on student contact hours in average daily attendance. Nonetheless, when working through the design of the moderation, correlation between the two was small since the Federal Perkins funding was part of the total spending and was not calculated on the same set of formulas.

Using a process macro developed by Andrew Hayes allowed a gain in Syntax to plot out the effect of these interactions. After visiting <http://processmacro.org>, the PROCESS written by

Andrew F. Hayes was identified. Once downloaded, the extension and utilities in SPSS allowed installation of the custom dialog package files for the PROCESS. After the installation of Andrew Hayes 3.3 PROCESS, the regression analysis of this moderation was repeated in establishing the process, to generate code for visualizing the interactions, the Mean center for construction of products was selected only for continuous variables that defined products. Mean centering the interactions allowed for three different lines to emerge for this analysis. In addition, since the data were extremely skewed as mentioned before due to the variation between groups, the condition values were chosen as the 16th, 50th, and 84th percentiles which was the proper alternative with skewed values instead of -1 standard deviation, mean, and +1 standard deviation.

Table 7

Conditional Effects of the Focal Predictor at Values of the Moderator:

| Percentile | Variable | Effect | Se | p |
|-----------------------------|------------|--------|-------|-------|
| 16 th Percentile | -2295.7082 | .3204 | .0792 | .0001 |
| 50 th Percentile | -1684.8082 | .299 | .0849 | .0006 |
| 86 th Percentile | 2365.3318 | .1599 | .1363 | .2428 |

Once the moderation generated the results, the outcomes showed that R-sq in the model summary as .4922 which established that essentially fifty percent of the variance within the (dependent variable) programs of study offered and at a significant level with a p value of .0000. Within the moderation the amount of enrollment became significant for -1 standard deviation with a p value of .0001 and for the mean average significance held true with a p value of .0006. However, at the 86th percentile above the mean average (50th percentile) resulted in no statistical significance with a p value of .2428 depicted in Table 7. This became significant in the research, since a moderator variable functioned as an independent variable. Baron and Kenny (1986)

explain the relationship of the moderator should be uncorrelated to the predictor and the dependent variable.

The Hayes model within the function of using PROCESS in a regression analysis, defaulted to the mean average and +or- 1 standard deviation SD. When this was not within the observed range of data Hayes (2018) recommended probing percentiles (16th, 50th, and 84th) to guarantee that the probed points are always within the observed range of the data (Hayes, 2018). After copying the syntax code and transforming the data into a scatterplot chart in Figure 5 the low, average, and high fit lines depicted the 16th, 50th, and 84th percentiles respectively. The data sets created for the moderating variables resulted in the three fit lines that showed that more funding spent on a program did not result in a greater propensity of student offerings in programs of study when CTE enrollment was a moderating independent variable.

Figure 4

Moderation Analysis of Number of Programs of Study, Total Money Spent in CTE, and CTE Student Enrollment



After working through the moderation analysis using the reduction in power feature on spending, the next step indicated to rerun the regression analysis of Perkins spending and

program of study offerings. After running this reduction of power, the results that showed statistical significance. I was also able to design a scatterplot chart that showed a strong fit line that provided an excellent visualization of this analysis (Figure 4).

Three separate fit lines existed to describe the mean fit (50th percentile), and the 16th percentile, and 86th percentile. The chart depicted statistical significance for the mean fit of 50th percentile depicted as average. The chart also illustrated a fit line for statistical significance at the 16th percentile. Finally, the charts top line of high which was representative of the 86th percentile depicts a line of no statistical significance. Barron and Kenny (1986) informed this research by defining that a “moderation implies that the causal relation between two variables changes as a function of the moderator variable (p.1174).” CTE enrollment moderated the relationship between total CTE spending and the number of programs of study offered. The variables were centered on an interaction term between total CTE spending and CTE Enrollment at it pertained to CTE programs of study. Those with high CTE enrollment as it pertained to total spending and program offerings had no statistical significance.

Summary

The purpose of this quantitative study was to determine if local education agencies complied in offering programs of studies that aligned to local labor markets, prior to implemented policy reforms through Perkins V. In addition, due to the nature of policy reform being attached to financial opportunities, this study sought to analyze the effect federal funding had on program of study offerings. Finally, this study analyzed if total spending for career and technical education programs effected program of study offerings when moderated by CTE enrollment. Chapter 5 reviewed this study as it related to the literature and produced conclusions around the findings and recommendations for future studies.

CHAPTER 5

SUMMARY

The results of this study, implications, and important conclusions drawn from the data presented in Chapter 4 are summarized in this final chapter. These results and discussions provide the narrative for further implications, recommendations, and future research.

Overview of the Problem

To address the gaps between workforce and education, research showed that a more focused and local approach was beneficial in planning and preparing for the future labor market needs. Recent reform within the federal accountability system called for career and technical education to develop a system of alignment by way of the the Strengthening Career and Technical Education for the 21st Century Act (Perkins V) in the summer of 2018. I sought to determine if independent school districts that offered career and technical education programs located in north central Texas provided program offerings that aligned to the needs of the local labor market prior to new Carl D. Perkins legislation enforcement. In addition, to what extent did those programs which received federal dollars through the Perkins federal grant offer programs that were aligned with the needs of the local labor market.

Purpose of the Study

The purpose of this quantitative study was to determine if the CTE programs located in the 16 counties that make up the north central Texas area which served 362,417 CTE students in 2018-2019, were aligned with local labor market needs prior to the mandated Perkins V full implementation in the school year 2020-2021. My intent was to evaluate the program alignment around regional and state programs of study in CTE for Texas as they aligned to Workforce Development Area (WDA) 4, 5, and 6 labor market indexes in fall 2019, and to confirm any

correlation between federal and state funding amounts with a local education agency's program of study offerings. The study in its totality added to the body of work around educational policy as it pertained to CTE, Perkins V effectiveness, prior accountability, and fiduciary alignment.

Q1: To what extent are career and technical education programs offered in secondary schools in north central Texas aligned with current labor market needs?

Q2: Does a school district that receives a larger concentration of Perkins grant funding per capita have a greater propensity for program of study alignment to local labor markets?

Q3: Is there a correlation between state and federal spending for career and technical education of a particular local education agency and program alignment with current labor market data based on district National Center for Educational Statistics and TEA classification?

Review of the Methodology

To conduct a complete analysis and arrive at a set of results, a variety of archival data were obtained from Texas Education Agency public websites, as well as state reports from official websites with the department of CTE at Region XI Education Service Center and TEA. In addition, the public Comprehensive Annual Financial Reports (CAFR) for each local education agency, and CTE spending reports for each LEA in the north central Texas area which met designed criterion were downloaded. For the final stage of this study, two different regression analysis in SPSS were conducted with no returned errors to plot the correlation between federal funding and program alignment, total CTE funding, including both state and federal direct expenditures and program alignment, and finally combined funding and institutional size categories and program alignment. Each of these analyses provided evidence to answer the research questions around funding and program alignment as it pertained to CTE in north central Texas.

Major Findings

Using the snapshot of time prior to COVID-19 as well as the enactment of new legislation governing career and technical education provided a strong point of reference for determining if schools in North Central Texas were providing programs that aligned with local labor markets. This binary question provided a very simple answer of yes, in that every school which received funding from the federal government by way of the Carl D. Perkins act, provided at minimum, one program of study that was aligned to high-wage, high-growth jobs in the region. This research demonstrated statistical significance between the amount of federal funding support a school district received and the number of programs that same school district offered.

In addition, when combining the state and federal funding as total CTE funding provided for a school district, and the number of programs of study offered there was statistical significance found between funding and program offerings within the groups that met the mean average at the 50th percentile and at the 16th percentile. Yet for those subgroups which were at the threshold of 84th percentile there was not statistical significance of program offerings with total program spending when moderated by CTE enrollment.

The amount of archival data available for this study were so great that it was necessary for me to narrow the focus to primary data sources. However, in determining these primary sources it was essential to look at all the data available and evaluate where to focus to answer the questions posed within the study as it related to the literature. After evaluating the wide variety of financial, demographic, and labor market data several conclusions surfaced that informed my process in moving forward but would be reserved for future research.

- The concentration of programs of study offered in the region is not in alignment with the programs of study's with the largest concentration of current or projected employment openings.

- A majority of all state CTE funding in a district is focused on teacher or administration payroll for CTE.
- Perkin’s funding is a minimal percentage of total CTE spending, but a larger percent of non-payroll expenditures for many districts.
- You cannot legislate program alignment and personal choice. Each local education agency has authority to choose what program of study to offer their students.
- 30% of all CTE funding never makes it directly to the CTE student or program.

Findings Related to the Literature

Thomas Freidman reminded us that the difference between reform wholesale and reform retail was “administrative orders and authoritarian dictates versus public buy-in and vested economic interest” (Friedman, 2005 p. 420). The literature reviewed in this study continually showcased government expectations of outcomes tied to compliance and administrative order. Perkins V legislation came with a 48-point checklist in the way of reform and compliance. More than one-third of those points centered around some function within programs of study offerings and access (Hyslop, 2018). School districts situated in the north central Texas area were indeed compliant. While one might look to Mancur Olson’s (1965, 1982, 2000) economics of collective action theory around what motivated and incentivized people to act, this study revealed Perkins V implications might have been better suited around the relationship of reform. While the compliance of program of study offerings was accounted for in each school district, this did not provide a context for why a particular program of study was chosen or how many were offered within the context of a singular school district.

The original Perkins IV legislation and subsequent renewal in 2012 required program of study offerings; however, the difference in a program of study definition for Perkins V varied greatly when assessing program quality, access, and outcomes. The prior legislation, which had been in place for 12 years at the on-set of this study, could explain the answer to the initial binary

question, in that all schools offered a program of study, which now met additional criterion for being aligned to the communities' local labor market index. Research around educational reform that was sustained insist that a district's ability to "communicate and negotiate" reform was as important as being "given the tools and strategies" to support those reforms (Datnow, Hubbard, & Menhan, 2002, p. 38). Based on the research, federal Perkins funding provides a portion of the tools necessary to offer and implement program of studies that are aligned with local labor markets.

The findings of this study, to some degree, showed that federal spending and program of study offerings had a predictive positive relationship. Repeatedly, the literature had focused on the need for programs of study and expanded the role of guidance in implementing programs of study as well as the effectiveness of programs of studies on student achievement. While research is available around student academic achievement and school spending, the literature showed great deficits in CTE spending and program opportunities.

The value of investing in career and technical education greatly impacted opportunities for students to develop their technical and professional skills (Perna, 2018). According to Joseph and Canney (2019), "State-level funding for CTE provides the greatest lever to ensure investments in CTE results in value for students and state economies" (p. 6) Texas' model for statewide funding beyond Perkins funding included weighted allotments whereas other states may allot state funding based on availability of funds or funding pools. Nonetheless, state and local funding, in combination with Perkins' funding, provided the total operating cost of a district's career and technical education program and its subsequent programs of studies. I found that the districts analyzed within the region were operating the programs of study solely on the combination of Perkins funding and state allotments. However, not all the \$489 million in state

CTE allotments in 2018-2019 for these districts were used to provide programs. More than \$155 million were not categorized as a CTE expenditure for program intent 22. In this same 2018-2019 school year, nearly all the 13 million federal Perkins' dollars provided for the same CTE programs were spent on direct cost in support programs of study. Although federal Perkins dollars were more restrictive in nature, districts maximized the utilization of these dollars (Joseph & Canney, 2019).

Figure 5

NCES School District Types and Distribution of CTE Allotments as a Sub-Group

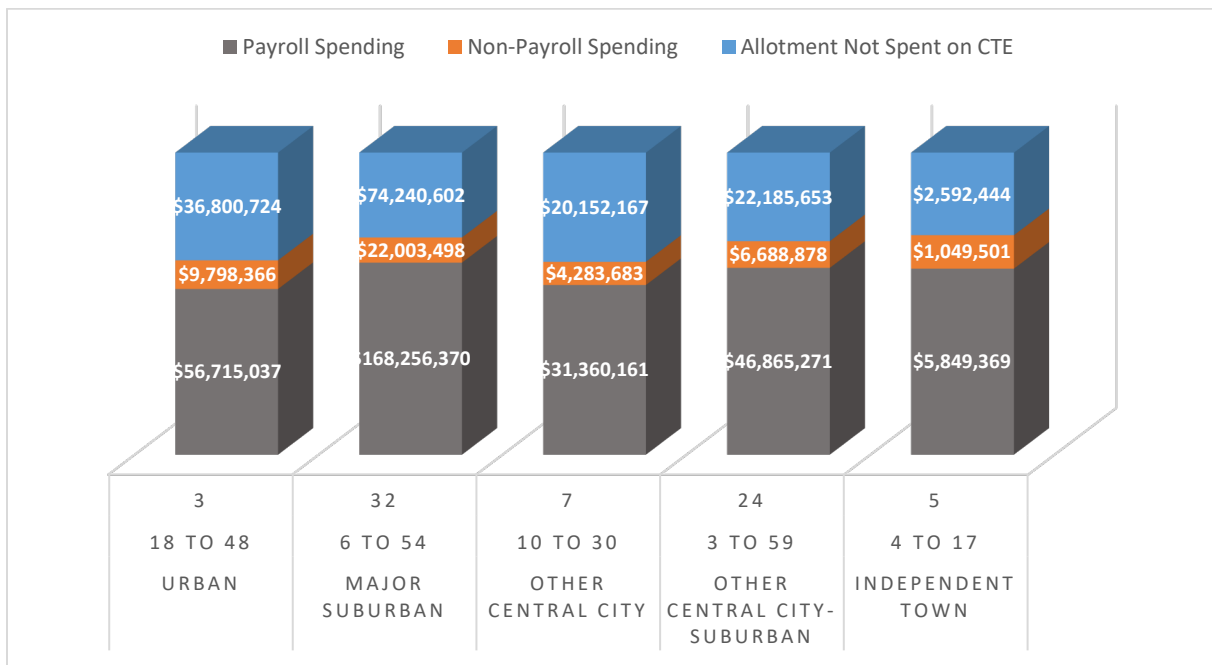


Figure 5 depicts the distribution of state CTE allotments in five different NCES district types. From urban to independent towns when evaluating the aggregate spending, nearly thirty percent of allotment distributions for each of these subgroups never makes it to direct spending in supporting career and technical education. Across the X-axis of this chart the first line depicts the total number of districts that make up this NCES group within North Central Texas. The second line depicts the range of programs of study offered, and the third line serves as the

categorical label. Visually it is clear that district discretion for non-required spending shows that many if not all the schools who make up these subgroups have large contingency of funds that is being redistributed to other functions within the school district that are not CTE focused. During the 2018-2019 school year, Texas Administrative Code stated

Funding was just one of the tools leveraged within the newest Perkins V Act: it was part of the incentivization to offering high-quality programming. The newest reforms that were the product of this Act included review of program quality along with the comprehensive local needs' assessment (Joseph & Canney, 2019). Previous legislation mandated program offerings but did not require the type or strength of alignment that was being expected for accountability at the state and local levels (Stipanovic, Lewis, & Stringfield, 2012). Since the research showed (a) the amount of Perkins funding, (b) the number of programs of study offered carried a positive relationship, and (c) the amount Perkins funding was known each year for districts in Texas, the state and region could provide estimates for future projections should a districts Perkins funding increase or decrease. In addition, should the State of Texas follow the lead of other states such as Florida, Indiana, and North Carolina which all provided additional funding for student performance based on desired outcomes, the potential for reform on not only program of study offerings, but program quality. (Joseph & Canney, 2019).

For a program to establish the highest degree of alignment to local labor markets, both federal and state funding must be maximized by the local school district. However, when looking at the degree to which program offerings were influenced by total funding, a moderation analysis showed that high enrollment in CTE programming did not result in CTE spending predicting the total number of aligned programs of study offered by an individual district.

The larger implications around the literature were found in the research around equity as

it pertained to spending. As stated by Stipanovic, Lewis, and Stringfield (2012), “Previous consensus had emerged that high school occupational courses should prepare students for meaningful work in a modern economy” (p. 82). Prior to Perkins V implementation, the legislation was attempting to improve the delivery of instruction through spending and ensuring access for all students to rigorous content that was aligned with industry-recognized credentials and postsecondary education. This might have been a result of previous legislation that moderately adjusted over time to align with local labor markets. Each of the 59 programs of study had some occupations that fell in the category of high wage/high growth, high wage/low growth, low wage/high growth, or low wage/low growth.

Perkins legislation for CTE programs sought to increase access for all students to earn technical skills that would lead to high wage, high growth job opportunities. However, a school district had no accountability in providing more programs based on allotment dollars. If the programs offered were indeed aligned, a school district could elect to offer only a minimum number of aligned opportunities without regard to their allotment funding. This minimum accountability did not address the larger problem of opportunity gaps for those most marginalized within the system (Smith, Frey, Pumpian, & Fisher, 2017; Lindsey, 2017).

If a school district’s administration believed their students should only have access to a small number of programs or if they were aligned to the labor market, then funding remained constant. A community of marginalized students might only have access to a small number of opportunities, as determined by a local education agency, with minimum regard to the amount of funding provided by the federal government. The *Pathways to Prosperity* (Pathways to Prosperity Network, 2014) and *Learning for Careers* (Hoffman & Schwartz, 2017) deliberately pointed to high-quality programming providing students with work-based learning experiences

that aligned to labor markets. The Texas State Plan sought to ensure students gained access to programs of study that included these experiences and that state and federal dollars supported these opportunities so long as the program of study was aligned to the local labor market (Texas Education Agency, 2021).

With 1.5 million students being served in Regions X and XI in 2018-2019 and the region being just below the state average of 60% students of poverty, then access to a variety of high-quality programs that promoted students succeeding academically while preparing for careers that can provided a family supporting livable wages was tantamount (Texas Education Agency, 2019). Students who receive additional wrap-around services within a district should have access to the strongest training (Smith, Frey, Pumpian, & Fisher, 2017) and should be exposed to the training necessary for high-end jobs ((Friedman, 2005).

The research was surprising in that when combining both federal and state allotments, greater funding usage meant the opportunity for more programs of study that were aligned to the local labor market were present in each school district no matter its size designation. Therefore, program opportunities were not limited by school district size, but rather school district investment of opportunities. A school district with 9-12 grade enrollment of 1,105 and designated as other central city suburban provided as much opportunity to programs of study as a school district with 9-12 grade enrollment of 17,324 in proportion to their state and federal spending. Nonetheless, provisions of opportunity for programs of study did not ensure a program of quality. The results of this portion of the research study confirmed that federal spending impacted program of study offerings. Schools should continue to invest in offering programs of study; however, this study diminished in impact since quality of programming and the performance of students within the individual program of study were not evaluated. Researchers

should continue to examine programs alignment, quality, and student outcomes in a region.

The research that surfaced through the moderation analysis where CTE enrollment was used to moderate the findings of total spending and the number of programs of study offered aligned with previous research around the substance of spending in a particular context (CTE spending) versus on average spending (all district spending). C. Kirabo Jackson (2020) evaluated the limitations of early literature around student outcomes and spending with recent findings and potential policy implications. Jackson's findings reported a strong causal relationship between increased spending and student outcomes. The moderation analysis left implications for practice as it relates to student opportunities; however, I did not examine the quality of the programs offered or student performance outcomes. Based on the need for legislative reform implicated by the Texas State plan for the Perkins V. legislation and responses of local workforce, it was implied that although these programs were aligned to local labor market needs, they were not providing the employees needed to be impactful on local labor shortages. The research highlighted where an over prescription of programs of study had additional implications on labor shortages in a particular area.

Further examination of the total amount of funding not spent directly on career and technical education programs should cause alarm to the Texas legislature and the Texas Education Agency. Continually, the Texas administrative codes have been amended to reduce the amount of required direct spending for career and technical education; yet, this same administrative and legislative bodies have continued to increase expectations of CTE. The data supported that school districts divert funding intended for career and technical education programs of study to other areas within the district. It was unknown if this diversion of funding has residual average effect on student outcomes. Jackson (2020) reminded us that while there

was evidence of a positive causal relationship in spending and student outcomes, there was no context on increased spending in career and technical education increasing student outcomes. Nonetheless, spending does have some impact on the number of program opportunities students have within a given district CTE program.

Recommendations

The literature around career and technical education and program of study offerings as they aligned to local labor markets was somewhat adequate; however, in context with the new governance of Perkins V and the changing expectations/definition of a program of study, there continued an extensive opportunity for future research. This study discovered such varying degrees of program offerings within school districts that were in like groupings that a mixed-method research opportunity existed. Based on the facts outlined, the following statements were suggestions for future research as it pertained to career and technical education and the most recent requirements of Perkins V legislation:

- 1) Evaluate the number of programs of study offered in a CTE program and what motivated decision makers to offer a particular program of study or how many programs of studies?
- 2) Study the number of programs aligned and the number of students who complete that program of study with an industry-based credential.
- 3) Examine research on the number of career and technical education programs that spent above the minimum required state CTE spending for program Intent Code 22 (PIC 22) and the outcome variable of industry-based credentials and work-based experiences earned by students in those programs.
- 4) In addition to examining the number of programs of study, the categorical analysis of each program of study and any indications of over prescription of program of study.
- 5) Study the effects of CCMR outcome bonus funding PIC 38 as it relates to students earning industry-based credentials.
- 6) Examine the program participation, concentration, and completion of students who receive special education services in programs of study.

Conclusion

The reauthorization of Perkins V, Strengthening Career and Technical Education for the 21st Century Act, was supposed to increase access for students to programming that aligned more closely with high-wage, high-demand jobs in each labor market. The legislation attempted to regulate these opportunities through an application for funding and an assurance from the school district that funds would be used to offer programs that were in alignment to the local labor market and those programs would be accessible to all students.

The purposes of this study were to investigate and build conclusive evidence that the districts in north central Texas were in fact compliant in federal legislation prior to the Perkins V implementation. The explicitness of aligning with local labor market index opportunities was necessary on the part of the state of Texas to align with federal requirements and maintain good standing. Nonetheless, the findings of this study supported that previous legislation was providing some level of accountability in program alignment. But as evidenced by the heavy legislation, this federal and state effort was attempting to overcome the disjointed education and workforce system.

The research also showed that school districts were offering to varying degrees programs already in alignment to local labor markets, but the federal dollars did impact to a degree a level of compliance in offering aligned programs of study. Due to the extreme variation among program offerings within a singular NCES school district type, this study fell short of building a strong correlation between the size of a district and student opportunities. In addition, CTE funding and program quality needed further development to create a more concise evaluation of academic-return-on-investment. Future legislation might provide potential changes with additional requirements for program offerings based on innovated funding and incentives rather

than school district size. No matter the determination, legislation while holding schools accountable to providing access and opportunity, should not undo a local education agencies ability to provide some level of autonomy in their decision making when offering programs of study within their community. Until the multitude of networks, all trying to solve this workforce education system problem, aligned, systemic sustained change continued to be out of reach.

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