Impact of Career and Technical Education Program Completion on Graduation Rates of Select Student Groups in Kansas High Schools

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Abstract

Career and Technical Education's (CTE) original purpose was to build trade-skills in individuals entering the U. S. workforce directly after graduation. As the years progressed and the needs of the workforce changed, so did the scope and sequence of CTE programs to provide skills and knowledge in both vocational and post-secondary academic degrees. Recent research has shown the benefits for students participating in CTE programs. The purpose of this study to examine the impact of completing a CTE program of study on the graduation rates in three urban Kansas high schools. The purpose of the study was to compare the graduation rates of CTE completers to the state average graduation rates of CTE completers. The graduation rates were specifically compared based on gender, males and females, and ethnicity, White, African-American, and Hispanic. Archival data were collected from the Kansas Department of Education (KSDE) Data Governance Board. Graduation and demographic data from three urban school districts, from 2015 to 2018, were included in the sample population. Using an independent-sample *t* test, it was discovered that the average graduation rate of CTE completers was significantly higher than and the average graduation rate of CTE non-completers. Using a one-sample *t* test, a statistically significant difference between the average graduation rate of White CTE completers and the overall average graduation rate was discovered. No other statistically significant difference was found in this study.

Dedication

First, I wish to dedicate this endeavor to my loving and supporting family. I would not have completed this journey without your love and encouragement. I could fill another 50 pages with my thanks to all of you. I hope that I have made you as proud of me as I am of you. I love you all.

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Chapter 1

Introduction

A successful K-12 education is comprised of many parts: a supportive environment, research-based best practices of instruction, highly qualified teachers, and students who successfully complete programs to prepare them for their future. Recent legislation such as No Child Left Behind (NCLB) in 2001 and Every Student Succeeds Act (ESSA) of 2015 have attempted to mandate all students be provided a quality educational experience. These reform initiatives have created an increasing set of demands on performance outcomes, including graduation rates, for all schools in the United States. Parents and various community members have added additional pressure on schools by emphasizing graduation rates and the need to prepare students for future employment.

Local businesses and trades have demanded higher-quality training for students, in addition to the high school diploma, as necessary criteria to enter the workforce upon graduation. Association for Career and Technical Education (ACTE, 2014a) predicted the job outlook through the year 2022 includes many of the highest paying technical jobs requiring the knowledge and skills taught in CTE classes. ACTE (2014a) found that a higher percentage of future jobs may require education beyond high school. ACTE (2014a) indicated changes in labor markets and the private business sector have a more considerable influence on schools than in years past.

The demand for highly-skilled workers placed greater importance on preparing high school graduates to be college and career ready in an ever-changing and competitive job market. A high school diploma is the minimum academic requirement for technical

jobs (ACTE, 2014b). On average, high school graduates earn more than those who do not finish high school, and a high school diploma is a prerequisite for post-secondary education required for other jobs that pay even more (ACTE, 2014b).

Career and Technical Education (CTE), formerly known as vocational courses of study, has become more abundant throughout the nation over the last 20 years (Hirschy, Bremmer, & Castellano, 2011). CTE programs at the high school level both provide and prepare students for college and careers by giving them hands-on experiences in today's occupations (Hirschy et al., 2011). In CTE courses at the high school level, students can earn certifications and credentials relevant to the existing job market (ACTE, 2014b).

The ACTE conducted a study in 2014 that investigated the impact of CTE programs on graduation rates nationwide. According to ACTE (2014b), students who actively participate in CTE programs have a graduation rate of 90.18% compared to 74.9% of students who do not participate in CTE programs in high school. Neild, Boccanfuso, and Byrnesv (2013) reported a 53% difference in graduation rates between students who were enrolled in at least one CTE course compared to students who did not participate in any CTE course in high school.

Background

In this study, the graduation rates in three urban Kansas school districts (District A, District B, and District C) are compared. This section contains demographic and academic achievement information for the student populations in the three school districts. Furthermore, the extent of CTE programs offered in each school district and district goals are included. The KSDE (2018a) created 16 career clusters for the CTE programs in Kansas (see Appendix A). Depending on the CTE program, a school

district's investment in facilities, specialized equipment, and annual consumables may vary. Furthermore, KSDE classifies students as CTE concentrators if they have completed three or more vocational courses in at least one of the 16 career clusters. KSDE provides course maps for each career cluster to identify which career cluster(s) a particular CTE course is aligned.

District A. During the 2017-2018 school year, District A, a Midwestern urban school district in Kansas, served 22,480 students. District A had five high schools during the length of the study. According to the KSDE (2018b) Report Card, District A reported 48.33% female students and 51.67% male students. The racial/ethnic distribution of students in District A was reported as 27.37% African-American, 49.76% Hispanic, 12.53% White, and 10.34% Other (KSDE, 2018b). District A reported 86.01% of their student population to be defined as economically disadvantaged and designated to have free and reduced lunch status (KSDE, 2018b).

Currently, District A high schools support at least four career clusters, some specific to one school, while others are available at each school. District A supports 10 CTE Pathways and offers a total of 84 CTE courses. CTE course offerings are based on student interest, facilities, teacher training, and funding.

The graduation rate for District A in 2018 was 73.8% (KSDE, 2018b). According to the District A Continuous Improvement Plan, the district's goal is for each student to exit high school prepared for college and careers in a global society. District A set a growth goal for graduation rates to rise by 14% from 2017 to 2018. This growth would set the graduation rate for the class of 2018 at 85%.

According to the KSDE (2018b) Report Card, District A students have scored below the Kansas state average for ACT scores. In 2017 and 2018, District A students averaged 16.6 and 16.2, respectively. The state average ACT scores for 2017 and 2018 were 21.7 and 21.6, respectively. District A set a goal to have 30% of the student population score a 21 or higher on the ACT. District A set this goal as a special distinction for graduates.

District A set a goal in 2011 for the class of 2021 to graduate with a distinction beyond a high school diploma. Those distinctions were for students to graduate with at least 15 college credit hours completed, a technical degree or credential, enlistment in a branch of the armed service, or at least a 21 on the ACT. To reach this goal, District A set graduation requirements in 2011 to include at least three high school credits in career technical courses. Though it is highly encouraged, it is not currently required for all three credits belong to the same career cluster. Currently, the district does not have a goal for the percentage of graduates to reach completer status.

District B. During the 2017-2018 academic school year, District B served 13,191 students (KSDE, 2018b). District B had six high schools during the length of the study. According to the KSDE (2018c) Report Card, District B reported 48.8% female students and 51.2% male students. The racial/ethnic distribution of students in District B was reported as 17.79% African-American, 31.73% Hispanic, 37.49% White, and 12.99% Other. District B reported that 76.09% of their student population to be defined as economically disadvantaged and designated to have free and reduced lunch status (KSDE, 2018c).

As of the 2018-2019 school year, District B high schools support at least four career clusters, some specific to one school, while others are available at each school. District B supports 10 CTE Pathways and offers a total of 84 CTE courses. CTE course offerings are typically determined by student interest, facilities, teacher training, and funding.

The graduation rate in District B has grown by 10.9% since 2015. The graduation rate for District B was 71.1% in 2015, 74.8% in 2016, 77.4% in 2017, and 81.8% in 2018 (KSDE, 2018c). District B showed growth in graduation rates from 2015-2018; however, the graduation rate of District B was still below the state average each year (KSDE, 2018c).

According to the KSDE (2018b) Report Card, District B students have scored below the Kansas state average for ACT scores. In 2017 and 2018, District B students averaged 19.7 and 18.9, respectively. The state average ACT score for 2017 and 2018 were 21.7 and 21.6, respectively (KSDE, 2018c).

District C. During the 2017-2018 academic school year, District C served 49,228 students (KSDE, 2020). District C had eight high schools during the length of the study. According to the KSDE Report Card (2018d), District C reported 48.97% female students and 51.03% male students. The racial/ethnic distribution of students in District B was reported as 19.23% African-American, 34.73% Hispanic, 32.73% White, and 13.31% Other (KSDE, 2018c). District C reported 79.12% of their student population to be defined as economically disadvantaged and designated to have free and reduced lunch status (KSDE, 2018d).

As of 2018-2019, District C high schools support at least four career clusters, some specific to one school, while others were available at each school. District C supports all CTE Pathways and offers over 100 CTE courses. CTE course offerings are typically determined by student interest, facilities, teacher training, and funding.

Since 2015, the graduation rate in District C has decreased by 1.3% (KSDE, 2018d). The graduation rate for District C in 2015 was 75.3%, in 2016 was 73%, in 2017 was 73.9%, in 2018 was 74% (KSDE, 2018c). Overall, the graduation rate of District C was below the state average each year (KSDE, 2018d).

According to the KSDE Report Card, District C students have scored below the Kansas state average for ACT scores. In 2017 and 2018, District C students averaged 19.3 and 19.0, respectively. The state average ACT score for 2017 and 2018 were 21.7 and 21.6, respectively.

Statement of the Problem

A high school diploma has become the minimum requirement to enter the workforce or pursue post-secondary education (Saddler, Tyler, Maldonado, Cleveland, & Thompson, 2011). For U.S. adolescents to be competitive in the ever-changing labor market, schools must prioritize the preparation of self-sufficient high school graduates who are ready to attend post-secondary educational programs or enter directly into the workforce at an entry-level position (DeWitt, 2007). A review of the literature showed that only recently have researchers examined the impact of completing a CTE program on high school graduation rates, particularly for ethnic and gender subgroups (Dougherty, 2016). Local educational systems must focus on programs of study that will meet the changing needs of post-secondary education and necessary career readiness skills.

Therefore, schools across the United States need to increase their graduation rates while instilling their students with the needed knowledge and skills essential to entering the labor market.

For example, DeWitt (2007) stated that, due to historical and social stigmas, CTE was an overlooked and often ignored program of study that can increase graduation rates and create a sustainable system for economic growth. Districts A, B, and C all provided students the opportunity to complete CTE courses and programs. However, the overall graduation rates reported by Districts A, B, and C were below both the national and state average graduation rates of 80% from 2015-2018. Research was needed to examine if a significant difference existed between the overall graduation rates of students who completed CTE courses and programs and students who did not complete a CTE program.

Purpose of the Study

The first purpose of this study was to examine the differences in graduation rates of students between CTE completers and non-completers from Districts A, B, and C for the academic years 2015-2018. Using the same samples, the second purpose of this study was to examine the differences between students' overall state average graduation rates and the graduation rates of CTE completers from Districts A, B, and C. The third purpose of this study was to examine the differences between male and female students' overall state average graduation rates and the graduation rates of the corresponding male and female CTE completers. The final purpose of this study was to examine the differences between ethnic subgroups' overall state average graduation rates and the graduation rates of select ethnic subgroup CTE completers from Districts A, B, and C.

Significance of the Study

The results of the study could allow school districts to assess the impact of CTE programs on students' graduation rates. The findings of this research may also allow districts to investigate the impact of CTE courses on graduation rates of different genders and ethnicities. The results of this research may assist future policymakers and educational leaders in evaluating the impact of CTE programs in meeting district goals. The findings may assist future policymakers and educational leaders in determining appropriate district goals for CTE programs. The results of this study may provide additional insight regarding the impact of a specific technical education course of study on the education of future high school students.

Delimitations

Lunenburg and Irby (2008) define delimitations as "the self-imposed boundaries set by the researcher on the purpose and scope of the study" (p. 134). The purpose of delimitations is to narrow the focus of a study. There are four delimitations in this study:

1. The population of the study was limited to students enrolled in District A, District B, and District C who graduated in 2015, 2016, 2017, and 2018.
2. Students in the population were classified as CTE completers or non-completers. No other CTE completion status was utilized.
3. The difference in graduation rates based on gender (male, female) and ethnicity (African-American, Hispanic, White) were examined. No other demographic variables were identified.
4. The researcher only analyzed district graduation rates compared to state-reported averages for a given school year.

5. African-American, Hispanic, and White were the only students included in the study. The sample investigates the three largest ethnicity subgroups.

Assumptions

Assumptions, according to Lunenburg and Irby (2008), are "postulates, premises, and propositions that are accepted as operational for the purposes of the research" (p. 135). The assumptions that influenced this research included:

1. All graduation and demographic data from District A, District B, and District C was accurately and completely represented by the KSDE.
2. All graduation and demographic data reported by District A, District B, and District C were complete and accurate.
3. All students had equal opportunity to participate in CTE programs in their respective school districts.

Research Questions

Research questions are meant "to define and guide the direction of a study" (Lunenburg & Irby, 2008, p. 126). Four research questions guided this study:

RQ1. To what extent is there a significant difference in graduation rates of students between CTE completers and non-completers from District A, B, and C for the academic years 2015-2018?

RQ2. To what extent is there a significant difference in graduation rates of students between the overall state average graduation rates and the graduation rate of CTE Completers from District A, B, and C for the academic years from 2015 -2018?

RQ3. To what extent is there a significant difference in graduation rates between the overall state average graduation rate for gender subgroups (male and female) and the

graduation rate of the corresponding male and female CTE completers from District A, B, and C for the academic years of 2015-2018?

RQ4. To what extent is there a significant difference in graduation rates between the overall state average graduation rate for ethnic subgroups (African-American, Hispanic, and White) and the graduation rate of the corresponding African-American, Hispanic, and White CTE completers from District A, B, and C for the academic years of 2015-2018?

Definition of Terms.

For accurate interpretation of this study's purpose and findings, terms specific to this research have been identified and defined. Lunenburg and Irby (2008) stated that key terms should be defined so the reader has a firm grasp of the concepts central to the study and provides a common basis of understanding. The following terms are defined for this purpose:

Application level course. As defined by KSDE (2017), an advanced level course is defined as a high school course that builds on the knowledge and skills from a technical level course and includes opportunities for the learner to demonstrate knowledge learned through the practical application of skills. It may include professional experience learning such as internship, health science clinical, or in-house training/marketing.

Articulation. As defined by KSDE (2017), articulation is a systematic, seamless student transition process from secondary to post-secondary education that maximizes the use of resources and minimizes duplication.

Career pathways. The Ohio Career and Technical Education (OCTE) dictionary (2014) defined career pathways as a series of academic, technological, and career-focused coursework and other educational experiences leading to a career specialty, college major, and employment in a career field.

Career-technical courses. According to KSDE (2017), career-technical courses are high school courses (for an approved cluster/pathway) that are one in a progression leading from introductory to technical to application levels that support state and national standards and competencies.

Career-technical education (CTE). According to KSDE (2017), CTE is defined as an educational methodology and strategies to prepare students for careers and continued education.

Career-technical programs. According to the Carl D. Perkins Career and Technical Education Act of 2006**,** career-technical programs are organized educational activities that offer a sequence of courses that provides individuals with coherent and rigorous content aligned with challenging academic standards based around the sixteen career clusters.

Consolidated annual report (CAR). According to OCTE (2014), the CAR is the documentation of career-tech work required each year by the U.S. Department of Education (USDOE). This report is comprised of four components: 1) a 20-page narrative; 2) enrollment data for secondary, adult, tech prep, and post-secondary programs; 3) accountability data for secondary, post-secondary, and adult programs; and 4) fiscal information (OCTE, 2014). The reports are due to the USDOE on December 31 of each year, and the statewide data is reported to Congress (OCTE, 2014).

CTE completer. KSDE (2017) defined a student who has completed a minimum of three secondary level credits in a single CTE pathway, with at least two of those credits being a combination of technical and application-level courses as a program completer. A completer must also earn an industry-recognized certification or a passing score on a third-party, end-of-pathway assessment or validation of industry skills through work-based learning experience (KSDE, 2017).

CTE concentrator. According to KSDE (2017), students who have earned two or more secondary level credits in a single CTE pathway are considered a program concentrator.

CTE participant. According to KSDE (2017), students who have earned a minimum of .5 credit, but less than two secondary level credits in a CTE pathway, are considered a program participant.

CTE report card. According to OCTE (2014), the CTE report card is the mechanism to measure and rate the performance of career-technical planning districts. The first CTE Report Card was released in the summer of 2013 and contained data for CTE Concentrators from the graduating class of 2011.

Employability skills. According to KSDE (2017), employability skills are defined as personal development and leadership abilities essential for increased workplace success and productivity, economic self-sufficiency, career flexibility, business ownership, and effective management of work and family commitments.

English language learners (ELL). The OCTE (2014) defined ELL as students whose primary or home language is other than English and may need special language assistance in school instructional programs.

Graduation rate. KSDE (2017) defined a high school's graduation rate is defined as the number of students who graduate in four years with a regular high school diploma divided by the number of students who form the adjusted cohort for the graduating class, represented as a percent.

Introductory level course. As defined by KSDE (2017), an introductory level course is a high school course that acts as an introduction to a specific or multiple clusters or pathways that require similar foundation knowledge and skills. Introductory-level courses are required to be taken prior to the technical and application level courses.

Kansas career fields. According to KSDE (2017), Kansas career fields are defined as occupations that are organized around broad, common knowledge and skills. Kansas Career Fields are recognized as Technology and Media, Business, Agriculture, Fabrication and Maintenance, Medical and Bio Technical, Public Service, and Family and Consumer Sciences (KSDE, 2017).

Kansas career pathway. According to KSDE (2017), Kansas career pathways are defined as organized groupings of rigorous academic and career-related courses leading from education to employment, which identify each step, skill, educational requirement, and aptitude needed to be successful within any specific career. Currently, there are 35 state-approved pathways identified within the 16 clusters.

Non-traditional fields. The term, non-traditional fields, refers to occupations or fields of work, including careers in computer science, technology, and other current and emerging high skill occupations, for which individuals from one gender comprise less than 25% of the total enrollment (KSDE, 2017).

Programs of study (POS). According to KSDE (2017), a POS is defined as a plan that incorporates secondary education and post-secondary education elements. The POS includes academic and career and technical content in a coordinated, non-duplicative progression of courses and leads to an industry-recognized credential or certificate at the post-secondary level or an associate or bachelor's degree.

Technical level course. As defined by KSDE (2017), a technical level course is a high school course that builds on the knowledge and skills learned in the introductory level course, focusing on acquiring practical technical skills specific to the cluster/pathway.

Unit of credit. KSDE (2017) defined a unit of credit as a measure of academic credit that may be awarded to a student for satisfactory completion of a course or subject.

Organization of the Study

This chapter included an introduction to the study, the problem statement, and background information of District A, District B, and District C. The significance, purpose statement, delimitations, and assumptions were also provided. Definitions of terms were included, and a brief overview of the study's methodology was provided. The remainder of the study is organized into four chapters, references, and appendices. In Chapter 2, the review of the literature includes research on the history and development of CTE programs in the United States and the state of Kansas, the history of graduation requirements in Kansas, graduation rates in Kansas, the purpose and contributions of CTE programs in schools, the limitations of CTE Programs, and the effects CTE programs have on at-risk students. Provided in Chapter 3 are the research design, participants, data collection procedures, data analysis and hypothesis testing, and

limitations related to this study. Chapter 4 includes the descriptive statistics and the results of the hypothesis testing. Provided in Chapter 5 are a study summary, findings related to the literature, and the conclusions.

Chapter 2

Review of the Literature

This chapter is a review of the current literature regarding the development, implementation, and impact of CTE courses. Due to the increasing focus of schools on encouraging students to complete CTE courses as part of their graduation requirements, specifically in urban schools. The examination of the historical development, implementation, and impact of completing a CTE program of study was imperative to understanding student achievement and post-secondary readiness.

Presented in this chapter is the literature pertinent to CTE and the impact of completing a CTE program on the graduation rates of select student subgroups. First, the history of CTE was explored to understand the development of programs, which led to waxing and waning positive and negative views and support of CTE over the years. Next, the literature on the CTE framework under Perkins IV related to how school systems have implemented CTE programs of study and their impact on student achievement was examined. Finally, literature regarding the positive and negative impacts of CTE programs of study was examined.

The History of CTE

The history of CTE is vital to understanding the impact of CTE programs on today's students. CTE programs have evolved from vocational training, where students would enter straight into the workforce in a skilled labor job. By 2020, CTE incorporated sixteen clusters spanning job fields while requiring post-secondary degrees and training beyond a high school diploma. The history of CTE is pertinent in understanding the impacts of completing programs of study on today's students.

Morrill Act of 1862. The foundation of today's vocational education programs was built on the Morrill Act. The primary objectives of the Morrill Act were "to teach agriculture and mechanical arts and to promote the practical education of industrial classes" (Russell, Broach, & Parker, 1938). The Morrill Act of 1862 granted each senator and representative 30,000 acres of land for their states to support and maintain a college through land grants. The selling of these land grants, at $1.25 per acre, funded 69 colleges (Russell et al., 1938). These colleges initially begun as agriculture and technical schools, now are commonly referred to as land-grant colleges, developed into public universities. Over the years, these colleges have provided educational opportunities for millions of U.S. citizens, particularly to those in need of financial assistance (Bruner, 1966).

From the beginning, there were issues with equitable education of minority students, particularly African-American students in the former confederate states and border states (Lee & Keys, 2013). The Second Morrill Act of 1890 stated "land grant funding be equally divided in states that maintained segregated colleges for separate races" (Lee & Keys, 2013). Congress passed into legislation the Second Morrill Act in 1980, establishing black institutions for teaching agricultural and mechanic trades. Prior to the Second Morrill Act of 1890, access to higher education for African-Americans in the United States was primarily limited to private universities such as Howard University and Fisk University (Lee & Keys, 2013). Since the early beginning of CTE programs, limitations on opportunities for post-secondary education and industrial training for minority students existed. These limitations continue to exist (Lee & Keys, 2013).

Smith-Hughes Act of 1917. The Smith-Hughes Act, formally the National Vocational Education Act, provided federal aid to the states to promote pre-collegiate vocational education in both agricultural and industrial trades as well as in-home economics (Steffes, 2020). The law expanded vocational course offerings and created an increase in overall enrollment. Many political supporters of the Smith-Hughes Act believed vocational education was a solution to shortages in skilled-labor and unemployment in the early 20th Century (Lee & Keys, 2013). These same supporters advocated that vocational instruction was vital to the country's economic progress and global competitiveness (Lee & Keys, 2013).

The Smith-Hughes Act of 1917 did not establish an equitable education for all students. A guiding principle of the Smith-Hughes Act was the belief that the curriculum should be guided by the country's economic priorities and values (Steffes, 2020). One outcome of the Smith-Hughes Act was the separation of academic courses and training based on gender. Female students were only allowed to take courses in female-dominated trades of the time, such as millinery and garment making. Female students were urged to take courses in home economics (Lee & Keys, 2013). Similarly, African-American students were encouraged to complete vocational education programs instead of collegiate academic pursuits (Steffes, 2020).

The Smith-Hughes Act of 1917 changed how we approached vocational education in the United States (Lee & Keys, 2013). The Smith-Hughes Act created a stigma that vocational education was designed for people deemed not intelligent enough for higher academic pursuits (Pundt, Beiter, & Dolak, 2007). This mindset continues to have a

detrimental effect on vocational education. Though not equitable, the Smith-Hughes Act presented educators the opportunity to advocate for educational reform (ACTE, 2019).

Before World War I, the need for skilled laborers in war industries increased. Enrollment in vocational courses increased to over 900,000 students across the country by 1926 (ACTE, 2019). This rise in enrollment led to an increase in lobbying organizations (ACTE, 2019). The two leading organizations, The National Society for Vocational Education and the Vocational Education Association of the Midwest merged into the American Vocational Association (AVA). The new organization prevented the U.S. Congress from eliminating all financial appropriations under the Smith-Hughes Act (ACTE, 2019). The Smith-Hughes Act would be reauthorized over the next 40 years through subsequent legislation (Calhoun & Finch, 1976). In 1929, The George-Reed Act was passed authorizing increasing annual appropriations for five years in agriculture and home economics (Calhoun & Finch, 1976). In 1934, the George-Ellzey Act replaced George-Reed Act for three years, increasing the total appropriations for vocational education to $3,000,000 (Calhoun & Finch, 1976). In 1936, the George-Deen Act increased authorized appropriations to $4,000,000 to the fields of agriculture, home economics, trades, and industry, and $1,000,000 to education (Calhoun & Finch, 1976). By 1942, the federal funding authorized for vocational education was $21.2 million (ACTE, 2014a).

Due to the need for workers during World War II, the AVA advocated for women and minorities to participate in vocational education courses previously prohibited (ACTE, 2014b). Nearly 7.5 million persons, including women and minorities, received training in war and defense industries and trades (ACTE, 2014a). Funding for vocational

educations increased as it was determined to be an integral component of the National Defense Training Program during this period.

AVA increased the educational opportunities of women and minorities in the United States. The increased labor needs of a wartime economy resulted in the growth of AVA's influence on the education system (Pundt et al., 2007). Education was no longer about purely academic pursuits, but about preparing citizens to be effective in the changing and growing labor force (Pundt et al., 2007).

Johnson legislative program for vocational education. To reform educational policy, the federal government committed additional funding for primary, secondary, and vocational education programs through the Vocational Education Act (VEA) of 1963 and Elementary and Secondary Education Act of 1965 (ESEA). Each piece of legislation emphasized equal access to education to close the achievement gaps between various student groups. VEA replaced federal funding programs for CTE that were set to expire (Lynch, 2000). ESEA provided federal Title 1 funding for primary and secondary schools (Lynch, 2000).

The purpose of the Vocational Education Act of 1963 was to replace federal programs regarding funding for vocational education that was set to expire. The purpose of the act was to serve students classified as lower socioeconomic status or a learning disability who would have difficulties in a regular education program (Lynch, 2000). After the passing of the act, federal funding was allocated to construct additional facilities for vocational education and increase the quantity and quality of offered vocational programs (ACTE, 2014b). The act authorized approximately 800 million dollars for vocational education. However, the U.S. Congress only appropriated $365.3 million.

ESEA was amended by the Bilingual Education Act of 1968 to provide funding and support for bilingual education and support for minority groups (Lynch, 2000). ESEA would be amended again in 1972 with the Equal Education Opportunities Act, which prohibited discrimination against students and teachers. ESEA's next amendment was in 2001 after the passing of the No Child Left Behind Act (NCLB). NCLB linked Title 1 funding to a school's assessment requirement to meet adequate yearly progress (AYP) (Lynch, 2000). The final amendment to the ESEA came when the Every Student Succeeds Act (ESSA) replaced ESEA in 2006. The ESSA retained the focus of the ESEA but shifted the system of accountability set up in NCLB to the states (Lynch, 2000).

During the 1970s, the United States economy saw an increase in the unemployment rate. Similarly, an increasing number of unqualified workers in the workforce led to increased underemployment (Calhoun & Finch, 1976). To address economic issues, Congress amended the Vocational Education Act. This new legislation consolidated and replaced all previous legislation except the basic structure previously provided in the Smith-Hughes Act (Calhoun & Finch, 1976). In 1976, an additional amendment to the act was passed that enacted a system to evaluate "how states and individual schools were complying with the implementation of the Vocational Education Act" (Hayward & Benson, 1993). This evaluation system was the beginning of many systemic changes that would see the federal government's increased role and active involvement in education.

Both the ESEA and VEA directly impacted the progression of CTE in the United States. ESEA and VEA increased access to CTE programs to more students, explicitly

targeting minority, low-income, and at-risk students (ACTE, 2019). ESEA and the VEA directly impacted schools with funding allocation policy changes and academic accountability (Lynch, 2000).

Carl D. Perkins Acts (1984-2018). The founding philosophy for vocational education can be attributed to one representative in Congress. Carl D. Perkins, a representative from Kentucky, was the most influential advocate for vocational education in the United States (ACTE, 2019). Perkins introduced HR4955 to Congress in 1963, which was signed into law as the Vocational Education Act by President Lyndon B. Johnson that December. Due to his contributions, all future vocational education legislation, starting in 1984, was named after Carl Perkins.

In 1984, the Carl D. Perkins Vocational Education Act (Perkins I) was signed into law. The act appropriated the funding for vocational programs for five years. This legislation was in response to a federal government request for vocational education to address social issues, such as the needs of economically disadvantaged youth, disabled youth, and minority students (ACTE, 2019). This legislation targeted vocational education programs serving low-income, minority, and special needs students who were deemed unable to attend post-secondary institutions (Stone & Aliaga, 2005).

In 1990, contemporary vocational education began with the Carl D. Perkins Vocational and Applied Technology Educational Act Amendments of 1990 (Perkins II). Amendments to the original Perkins I Act focused on 21st Century skills, increasing local and state accountability, building partnerships with local businesses, and integrating vocational education into the general education curriculum (United States Department of Education, 2007). The amendments were a direct response by Congress to the national

concern that high school graduates lacked the basic skills necessary to succeed in the global market (Pundt et al., 2007).

In 1998, the Carl D. Perkins Vocational and Technical Education Act (Perkins III) was signed into law (ACTE, 2019). Perkins III built on the structure of Perkins II with a focus on alignment and integration. Perkins III created the reserve fund in the states. Before establishing the reserve fund, states were allowed total fiscal authority to distribute Perkins funding (Pundt et al., 2007). Perkins III modified state authorizations so that 85% of the funding would reach local agencies. Perkins III also focused on increasing gender and racial equity in school program offerings (Novel, 2009). In the same year, the AVA changed its name to the ACTE, reflecting the new direction of Perkins III that shifted the emphasis from job-specific vocational training to skill-based, rigorous career education.

In 2001, the No Child Left Behind Act (NCLB) renamed and reauthorized the ESEA. NCLB was the most dynamic shift in federal involvement in education of its time and would have lasting effects on all future legislation (Novel, 2009). Threeton (2007) stated the "2001 legislation held all aspects of education more accountable, involved the federal government more than ever in public education, and placed more rigorous academic standards into vocational education coursework" (p. 4).

NCLB introduced an assessment requirement for schools to meet AYP, which was included in the formula to determine the amount of money school systems received from Title 1 grant funding (Novel, 2009). Title I grants are funding targeted at servicing programs for minority, low-income, and at-risk students (Threeton, 2007). Perkins III allocated funding to schools through Title 1 grants (Threeton, 2007). NCLB and school

systems' ability to meet AYP now directly impacted funding for vocational education programs.

In 2006, the term vocational education was officially retired from the U.S. legislation. Vocational education would be officially referred to as career and technical education in official legislation, with the passing of the Carl D. Perkins Career and Technical Education Act (Perkins IV). Perkins IV appropriated $1.3 billion to support CTE through Title 1 grants (Threeton, 2007). Title 1 grants allotted funding for CTE using a formula based on specific population groups and a state's per capita income. On average, 64% of funds were spent at the secondary level and 36% at the post-secondary level (United States Department of Education, 2007).

Legislation for reauthorizing Perkins IV was delayed in 2012. During this time, the system established by Perkins IV remained active (Lewis & Cheng, 2006). However, state and federal mandates regarding student achievement continued to increase throughout our nation. In 2015, President Obama signed the Every Student Succeeds Act, ESSA (United States Department of Education, 2015). ESSA required all students to meet high academic standards that would prepare them to succeed in college and post-secondary careers (United States Department of Education, 2015). ESSA also mandated that all school districts maintain an expectation that there will be accountability and action to effect positive change in lower-performing schools (Lewis & Cheng, 2006). ESSA mandate of responsibility specifically looked at where groups of students are not making progress, and where graduation rates are low over extended periods (Lewis & Cheng, 2006).

The ESSA established a fundamental change in CTE programs. Along with Perkins IV, the ESSA increased the scope of CTE programs to include college preparatory, technical career training, and vocational career training for all students (ACTE, 2019). ESSA designated that accountability for students meets rigorous standards for the states.

In July of 2018, President Donald Trump signed into law the Strengthening Career and Technical Education for the 21st Century Act, commonly known as Perkins V, that continued to support the general structure and focus of CTE programs articulated in Perkins IV (ACTE, 2019). Perkins V focused on increased funding opportunities for states with more flexibility regarding how individual states could allocate funds. Perkins V proposed a streamlined system for evaluation and administrative supports for CTE (ACTE, 2019). Perkins V legislation was authorized for implementation in the 2019-2020 academic school year.

CTE Framework and Supports Under Perkins IV

Perkins IV was the current legislation for CTE through the 2017- 2018 school year. Perkins IV created a framework for state and local agencies to develop and implement CTE programs and support agencies. Perkins IV resulted in an extensive restructuring of vocational education to CTE (Lewis & Cheng, 2006). This shift in priority and academic focus was governed through federal legislation noted in Perkins IV (Threeton, 2007).

The act designated 16 broad career clusters separated into 79 programs of study (POS), commonly referred to as Career Pathways (Sass, 2011). CTE career clusters and pathways were created to reflect the modern-day careers through courses designed to

provide students with hands-on learning experiences and real-world and relevant curriculum while integrating rigorous academic content throughout (Sass, 2011). The National Career Clusters Framework (NCCF) provided a structure for organizing and implementing CTE programs through learning and comprehensive POS (ACTE, 2019).

For schools to meet increased standards and raise graduation rates, new programs to engage students where needed. In 2003, the advisory committee for the National Assessment of Vocational Education (NAVE) suggested career and technical education should incorporate more real-world applications that would be relevant to students and the community. In his research, DeWitt (2007) suggested the loss of motivation and general apathy toward school was due to the curriculum of courses failing to include relevant real-life applications for students to connect to their lives. Plank, DeLuca, and Estacion (2005) believed a combination of CTE and other academic courses could positively impact students' motivation and interest in school. Plank et al. (2005) stated that exposing students to a variety of classes would provide students the chance to apply knowledge and skills in real-world situations. Plank et al. (2005) stated that making content relevant to student interests made classes more engaging, motivating, and increase student achievement in all academic contents. Plank et al. (2005) suggested that this shift in instruction would increase graduation rates if the school systems supported the programs. In 2012, the National Center for Education Statistics (NCES) indicated that more than 70% of secondary CTE completers attended post-secondary education.

National CTE Programs. By examining newer CTE models, researchers have found that these programs successfully help students transition from secondary to post-secondary education. In 2006, Dare researched four programs: High Schools That Work

(HSTW), Career Transition Initiative (CCTI), Tech Prep, Project Lead the Way (PLTW), and Career Academies. Though the organization and focus of the four programs are different, they all share the common goal of preparing students for college or a career by combing CTE and academics (Dare, 2006).

The first program, HSTW, was a national program that emphasized high expectations and rigorous academics for all students, including Career and Technical Education students. HSTW is the most extensive comprehensive school reform program for high schools in the United States, with over 1,000 schools in more than 30 states currently participating (Young, 2013). HSTW is a research-based continuous improvement model for schools focused on engaging students in real-life application of curriculum standards.

Kaufman, Bradby, and Teitelbaum (2000) rigorously evaluated the HSTW program. Kaufman et al. (2000) examined the relationship between academic achievement and the program's key practices as measured by HSTW assessment results. They found positive effects on student achievement for students who successfully completed their science and mathematics courses and who also regularly discussed their program with their high school counselor or teacher. Further, academic and vocational teachers who worked together were associated with gains in students' reading and mathematics scores (Kaufman et al., 2000). However, the conclusions of this study were limited using only the HSTW assessment results as outcomes data to evaluate the program. Further limitations include the use of different cohorts of students combined with a pre-test and post-test cross-sectional design.

The next program, CCTI, focused on the relationship and roles of the secondary schools and the community college. CCTI concentrated on assisting students transition from high school to college and careers by focusing on the goals of Perkins IV (Dare, 2006). Hughes and Karp (2006) found that this model's strength lies in the strict policies enforced starting in kindergarten through twelfth grade that ensured a smooth transition to post-secondary programs.

The third program, Tech Prep, was a national program intended to bridge post-secondary transition for students remaining in their POS after high school and into an associate's degree or industry-related certificate program (Castellano, Stringfield, & Stone, 2002). Tech Prep was initially introduced in Perkins II of 1990 and III of 1998 and was in the Perkins IV reauthorization of 2006. The POS in Perkins IV was created to be virtually identical to Tech Prep with the significant initiative on the articulation of secondary and post-secondary institutions (Lewis, Kosine, & Overman, 2008). Most research conducted on Tech Prep was not favorable. Gray (2004) conducted a longitudinal study that found no significant relationship between Tech Prep participation and GPA. Additionally, it was found that only 8% of high school students participated in the Tech Prep program in 1998 (Castellano et al., 2002). Funding for Tech Prep ended in 2012 (ACTE, 2019).

The fourth major program, Project Lead The Way (PLTW), was a national program founded in 2007 to engage students from preschool through graduation in project-based learning in CTE Pathways (Castellano et al., 2002). PLTW focused primarily on promoting career pathways associated with science, technology, engineering, and mathematics, or STEM. PLTW also provided professional development

and training to teachers and administrators in research-based instructional practices for CTE courses (Castellano et al., 2002). Pike and Robbins (2014) examined all U. S. graduates in 2010. Pike and Robbins (2014) asserted that PLTW students outperformed academically and were better prepared for post-secondary studies and are more likely to consider careers STEM. However, Pike and Robbins (2014) suggested that schools were limited to the quantity and quality of PLTW supported programs due to their annual cost.

The final program, Career Academies**,** consisted of local programs that became increasingly popular in the U.S., with many schools creating the model independently without state and federal financial support (Castellano et al., 2002). The design of a Career Academies program is a school within a school with an occupational focus. The curriculum of a Career Academy is thematic, revolving around a cluster of careers in a related discipline such as engineering or public service (Lewis & Cheng, 2006). Career Academies have included PLTW, college-now, work-study, and internship programs (Lewis & Cheng, 2006).

Hart (2017) examined the impact of CTE programs on different school models in New Jersey from 2011-2015. Hart (2017) found that the mean graduation rate for CTE high schools from 2011-2015 was 94.84%, while comprehensive high schools averaged 88.72%. However, Hart (2017) did not find a significant difference in graduation rates between CTE completers from the comprehensive high schools and CTE high schools.

Impact in terms of Student Demographics

The Editorial Projects Education Research Center (2018) reported graduation rates that ranged from 21.7% to 82.5% across the country. The Editorial Projects Education Research Center examined the effects of gender and ethnicity on the

graduation rate of CTE completers versus non-completers for three Kansas school districts from 2015 to 2018. Castellano et al. (2002) found some common variables that have decreased graduation rates, which include ethnicity, limited English proficiency, poverty, low self-esteem, high absenteeism, and students from urban schools. However, a school district or student's control over earning a high school diploma is impacted by many additional variables beyond either's control, such as student exceptionalities, home-life situations, and migrant status (Castellano et al., 2002).

ACTE (2017) data suggested that approximately one out of every three students enrolled in high school, starting in ninth grade, will not meet all credit requirements for graduation within the four years and not earn a diploma. In 2017, The United States was ranked 10th globally by the ACTE for high school graduation rates (ACTE, 2017). The graduation rate of the United States averaged about 70% since the 1980s and averaged 80% by the year 2000 (United States Department of Education, 2010). Educational systems at the local, state, and now national level listed "improving the graduation rate of American high school students" as a national priority (Richmond, 2009, p. 2).

Associated Press (2020) examined high school CTE program enrollment data from 40 states. The purpose of the study was to examine racial discrepancies amongst the enrollment in the CTE pathways. Associated Press (2020) determined that African-American and Hispanic students were enrolling in less STEM and information technology classes compared to White students. Associated Press (2020) discovered that Hispanic students had the greatest enrollment in hospitality courses, while African-American students had the greatest enrollment in human service courses. In some states, African-American and Hispanic students accounted for less than 25% of the enrollment

in STEM courses but were over 60% of the enrollments in human services and hospitality courses (Associated Press, 2020).

Gender discrepancies. Kaplin and Lee (2006) stated that the Educational Amendments of 1972 established a legal requirement that "no person in the U.S. should be excluded from participating in any education program or activity receiving federal financial assistance based on sex" (p. 1462). Kaplin and Lee (2006) found that now "35 years after the initial implementation of these gender-focused amendments, the divide in CTE has narrowed barely at all" (p. 1462). Togalia (2013) examined U.S. high school graduates in school districts. Togalia (2013) reported that approximately 86% of female students participated in gender traditional programs. Togalia (2013) defined gender-traditional programs as cosmetology, nursing, and family-related programs of study. Togalia (2013) stated that, on average, enrollment of female students was less than 10% of non-traditional programs such as HVAC, welding, and plumbing. Sanders and Lubetkin (1989) believed that a bias regarding women's ability to perform the skills necessary for HVAC, welding, plumbing, and electrical had led to a discrepancy in gender equity in society. The research of Sanders and Lubetkin (1989) focused on the promotion efforts to make all technical careers in the United States as inclusive as possible to all students. Sanders and Lubetkin (1989) contended that if there were not genuine efforts to promote non-traditional programs then many female students may choose to not pursue STEM courses in high school. Carl D. Perkins Act of 1984 required states to assign a sex equity coordinator to help overcome the gender equity issue in vocational education (Gathercoal & Stern, 1987). When Perkins was reauthorized in

1990, only 3% of federal funds were allocated to gender equity programs (Gathercoal & Stern, 1987).

The United States Department of Commerce (USDC) and NCES stated in their analysis of the 2000 U.S. Census that male students traditionally were more likely than female students to have dropped out of high school (Chapman, Laird, Ifill, & Kewal Ramani., 2011). Swanson (2004) discovered that males graduated from high school at a rate of 8% lower than female students. By 2013, the difference in secondary high school graduation rates of male and female students ranged from 2% to 4% on average across the nation (Stillwell & Sable, 2013).

Shadden (2011) examined all United States graduates from 2000 to 2005. Shadden (2011) observed that female students more often reached a higher academic success level than male students among CTE completers. Togalia (2013) examined discrepancies between genders related to non-traditional pathways, especially the highest-paying CTE pathways in STEM. Female students are far less likely to enroll and become completers in STEM pathways than in pathways such as cosmetology and childcare (Togalia, 2013). Female students do comprise 86% of enrollment among the healthcare pathways, which offer high-paying positions. Togalia (2013) asserted that many factors, including socioeconomic status and cultural backgrounds, could limit female students' decisions to enroll in various CTE pathways.

Neilson (2016) examined CTE's impact on Native American males in three high schools in Northern Arizona. Neilson (2016) asserted that this study was in response to the lack of literature on CTE's impact on gender and ethnicity. Neilson (2016) conducted various interviews with a small focus group of students to explore student perceptions of

CTE programs in high school. Based on the student perception survey results, Neilson (2016) discovered that the most significant factor identified for CTE impact was the industry expertise and specialized training of the teachers.

Cardin (2015) compared the high school graduation rates of students completing CTE programs of study and of students that did not complete a CTE program of study based on gender in a large Texas school district. The study used a causal comparative research design to compare the graduation rates of the various student subgroups. Cardin (2015) showed that CTE completers did graduate at a higher rate than non-completers. However, Cardin (2015) stated that there was no difference in high school graduation rates of CTE completers between the sample and the state average.

Ethnic discrepancies. Stillwell and Sable (2013) found the 2009-2010 average graduation rate for White students was 83%, compared to approximately 71% for Hispanic students and 66% for Black students, a concern for Mississippi with a population consisting of approximately 37% Black residents. Stillwell and Sable (2013) stated that Black, Hispanic, and other ethnicities were at a much higher risk of not graduating among secondary students in 2006. Stillwell and Sable (2013) found that in 2006, 6% of the White students, 11% of African-American students, and 22% of Hispanic students did not graduate from high school. Yates (2008) also stated that Black students were also more likely than White students to be placed in special education programs, lowering Black students' chances of graduating high school.

Chapman et al. (2011) stated that Black and Hispanic youth were traditionally more likely to have dropped out of high school than White or other non-Hispanic students. In 1972, the dropout rate was 21% among non-Hispanic Black youth, 12%

among non-Hispanic White youth, and 34% among Hispanic youth (Chapman et al., 2011). From 1985 to 1995, the dropout rates for Hispanic youth peaked at 36% (Chapman et al., 2011).

Although gaps between racial and ethnic groups have decreased over the last decade, migrant students are still more likely to have a significantly higher dropout rate than children born in the continental U. S. (Harrison, 2004). NCES (2017) stated that foreign-born students had a dropout rate of 10% in 2016. Foreign-born youth made up 17% of the dropout population in 2016. Comparatively, children of foreign-born parents made 30% of high school dropouts (NCES, 2017).

The stigma of CTE. The original design of vocational education courses and programs was to provide students training in specific trade skills, relevant to the time, so they would be better prepared to enter directly into the workforce after completing high school. From 1980 to 2000, there was a noticeable shift was seen in vocational education's structure and purpose away from workforce preparatory work (Cavanagh, 2005). Vocational education programs now include outcomes of increasing high school graduation rates and transitioning students into various programs after high school (Plank et al., 2005). Cavanagh (2005) stated that changes to the country's current economic status would have a lasting impact on U.S. schools. Cavanagh (2005) particularly noted the increased government oversight and emphasis on standardized testing to a common curriculum as factors that will question the significance of CTE programs in schools. Criticism regarding CTE's effectiveness in increasing academic achievement, attendance, or various other factors in schools has been prevalent for many years (Walker, Hail, & Mulvihill, n.d.).

Academics have long since maintained the philosophy that vocational education or CTE, are lower classes of educational pursuit (Lazerson & Grubb, 1974). Cohen and Besharov (2002) reported that CTE's public perception was due to the accusations that CTE was targeting the students with low levels of academic achievement or socioeconomic status who were receiving the lowest-quality instruction. Similarly, Harrison (2004) suggested that no significant evidence existed to prove the positive impact of focusing on vocational or trade-skills in schools, nor should such programs be promoted.

Biggerstaff (2020) examined the perceptions of high school administrators regarding special education placements within CTE programs compared to the participation rates of students with exceptionalities enrolled in advanced-level CTE programs of study. Biggerstaff (2020) found that administrators reported the belief that advanced-level CTE programs of study provide meaningful and appropriate opportunities for students with exceptionalities. However, Biggerstaff (2020) reported that despite this belief of administrators, students with exceptionalities were enrolled in advanced-level CTE programs of study at a significantly lower rate than general education students.

Positive impacts of CTE. Student apathy in school is usually attributed to decreases in personal motivation due to the inability to connect their learning to practical and tangible examples in their life (DeWitt, 2007). Some schools have adopted a possible solution to address this issue by enrolling students in both CTE and traditional academic courses (Plank et al., 2005). Schools that have incorporated this combination of classes and focused on student interest have lowered the dropout rate (Plank et al., 2005). Additionally, schools have provided career and pathway options to students that

better provide opportunities to learn content knowledge and skills that interest them while seeing the application in real-world situations (Plank et al., 2005). In 2002, The Bill and Melinda Gates Foundation surveyed high school dropouts to collect data on student rationale for not graduating from high school (ACTE, 2019). Their researchers found that 81% of students surveyed claimed that if their classes would have contained relevant real-life experiences and applications, then they perceived it would have significantly impacted their chances to graduate (ACTE, 2019). The advisory committee for the NAVE released a report in 2003 that outlined how CTE courses were able to impact learning by making lessons more engaging and relatable to relevant real-world applications than traditional academic courses (ACTE, 2019).

Research has supported the positive impacts of CTE programs in schools. Kulik (1998) surveyed approximately 18,000 high school seniors from more than 1,000 schools nationwide in 1995. Kulik (1998) found that CTE "increased the graduation rate by nearly 6% for high school students who were not considered college-bound" (p. 3). Plank et al. (2005) found that high school students had a greater chance of graduating if at least 40% of their daily coursework was related to CTE. Harrison (2004) suggested that CTE programs are essential to our current school systems as an important tool to raise graduation rates, attendance, and student interest. Pundt et al. (2007) stated in their research that CTE has been under-utilized for decades as a means to increase student engagement, raise academic achievement, and increase student success after high school. Meer (2007) also agreed that students of special populations such as at-risk, low socioeconomic status, or disabled students would see increased student achievement and graduation rates if schools utilized CTE courses proper00..ly.

DeLuca, Plank, and Estacion (2006) studied the post-secondary and labor force outcomes of students who graduated from American public high schools in 1992. Deluca et al. (2006) found that in their last high school year, 48% of the students expected to attain a bachelor's degree and that 24% expected to obtain advanced post-secondary degree, and only 8% expected that their highest level of education would be the completion of a program at a vocational, trade, or business school. The remaining 8% did not expect to attain any education beyond high school. These results varied somewhat by occupational course path; in general, as the number of occupational credits a student earned increased, the likelihood of aspiring to a bachelor's or advanced degree decreased. However, even though aspirations decreased somewhat among students with higher numbers of occupational credits, 36% of these students still aspired to a bachelor's degree.

Levesque (2008) examined CTE enrollment trends by analyzing data of students who graduated from U.S. public high schools in the classes of 1990 and 2005. Overall, there was no significant change in CTE enrollment over that period. In 1990, about 98% of students took any CTE courses, and in 2000 and 2005, 97% did so. About 91% of students in 1990 and 2000 took CTE courses compared with 92% in 2005, and 21–23% of students earned completer status in 1990, 2000, and 2005. No changes were observed in the average number of credits earned by the participants.

Orozco (2010) examined the effects of CTE program completion on student achievement, student engagement, and technical skills development on high school graduation rates in Texas. Orozco's (2010) quantitative analysis compared student graduation rates and student scores based on the Exit Level Math and English Languages

Arts Texas Assessment of Knowledge and Skills (TAKS). Orozco (2010) results did not indicate a correlation between CTE completion and student achievement. However, the study results indicated that participants' perceptions of CTE program effectiveness toward increasing student achievement and graduation rates were positive.

Neild et al. (2013) examined the effect of CTE program completion on student's academic achievement and graduation rates in an urban Kansas school district. Neild et al. (2013) found the odds of graduation within five years of entering high school at least 30% higher for students that completed a CTE program. Neild et al. (2013) found mixed results when examining graduation rates based on demographics. Neild et al. (2013) found significant differences in the graduation rate when comparing CTE completers to non-completers based on demographics. Neild et al. (2013) found no significant difference in gender or ethnicity when compared to the national graduation averages.

Bennet (2016) examined the impact of CTE concentrator status on graduation rates of high school students in Kentucky during the 2012-2013 school year. Bennet (2016) found a significant difference in graduation rates of CTE concentrators and non-CTE concentrators. CTE concentrators graduated at a significantly higher rate. Bennet (2016) found no significant difference in graduation rates of CTE concentrators for males and females.

Dougherty (2016) researched three regional vocational and technical schools (RVTS) in Massachusetts. RVTS are high schools centered around career-oriented instruction. Students typically alternate instruction between the classroom and technical shop in RVTS. RVST typically offers higher quality CTE course than comprehensive high schools. Dougherty (2016) found that students attending one of the three RVTS

graduated from high school at a significantly higher rate than the average graduation rate of comprehensive high schools in Massachusetts.

Jenkins (2017) examined the impact of students earning CTE concentrator status and graduation rates in Missouri high schools. Jenkins (2017) compared CTE concentrators to non-CTE concentrators for all high school graduates in Missouri from the 2015-2016 school year. Jenkins (2017) explored the impact of CTE on two independent variables, which were gender (male and female), and ethnicity (African-American and Hispanic). Jenkins (2017) performed independent sample *t*-tests on all two select subgroups of students. The graduation rates of CTE concentrators were significantly higher than non-CTE concentrators for both variables.

Cross and McGuire (2019) examined the effects on graduation rates, attendance, and discipline incidents in Tennessee's high schools. Cross and McGuire (2019) found that students who earned CTE concentrator status graduated at a significantly higher rate than students that did not earn CTE concentrator status. Cross and McGuire (2019) did not find a correlation between CTE concentrator status and attendance or discipline incidents when compared to state averages. However, Cross and McGuire (2019) stated that attendance rates and the number of discipline incidents met individual school goals.

Horton (2019) investigated whether completing CTE courses in high school had an impact on student achievement in high school graduates in Mississippi. Specifically, Horton (2019) researched student performance on the English II exam, Algebra I exam, and ACT assessments. Horton (2019) found no significant difference in ACT assessment scores; however, determined a significant difference in Algebra 1 and English II exam scores were found for students enrolled in multiple CTE courses. Horton (2019) found

significant differences in the number of students taking CTE courses and those not taking CTE courses based on gender and ethnicity.

Economic impact of CTE. Harrison (2004) found that as "individuals increased their level of educational attainment; they also improved their average annual earnings" (p. 5). Harrison (2004) reported the U.S. Census Bureau (USCB) determined that citizens, 25-64, over the last 30 years that worked full time without a high school diploma averaged approximately $23,400 annually. From 1970-2000, the USCB reported full-time working citizens, 25-64, with only a high school diploma averaged approximately $31,200 annually. Alternatively, in his research Harrison (2004 that full-time working citizens, 25-64, with a high school diploma averaged an additional $7,000 annually. Full-time workers with a high school diploma were paid 30% more in average annual salary than individuals who had dropped out of high school (Harrison, 2004).

Bishop and Mane (2004) conducted a 12-year longitudinal study of U.S. graduates from 1990 to 2002. Bishop and Mane (2004) found that the students who devoted about one-sixth of their time in high school to occupation-specific vocational courses earned at least 12% more income one year after graduating and about 8% more income seven years later. Bishop and Mane (2004) suggested that students who completed CTE programs and coursework were more marketable and employable than their fellow students. Additionally, Bishop and Mane (2004) suggested that students who completed CTE programs of study were more like to have a higher starting salary in their field than students who did not complete any CTE courses or programs. Bishop and Mane (2004) stated that on average, a student that earned CTE completer status would earn 20% more than students that completed no CTE coursework.

Kemple and Wilner (2008) examined career academies in the early 1990s before many of the occupations in 2020 even existed and before introducing policies with important implications for secondary schools. The schools in the study were in or near large urban areas with predominantly low-income minority student populations. The career academy programs were oversubscribed, which permitted admissions to be determined by lottery. Kemple and Wilner (2008) found that career academies had no impact, positive or negative, on high school graduation, post-secondary enrollment, or educational attainment. However, the results indicated that students who received the opportunity to attend a career academy earned 11% more than the control group. Male students saw an average of 17% earnings boost after graduation. There was no significant difference between the earnings of females in the treatment and control groups.

Hobson (2015) examined whether specific CTE pathway options for students had a significant impact on student's graduation rates in a suburban school district in Tennessee from 2012-2014. Hobson (2015) found that students were more likely to enroll in CTE pathways related to white-collar careers specifically offered in the community. Hobson (2015) discovered that students who earned CTE concentrator status graduated at a higher rate than non-CTE concentrators. Hobson (2015) also determined that students who enrolled in CTE pathways available in their community were more likely to indicate plans to return to their community after receiving post-secondary training.

Negative impacts of CTE. In a study conducted by the University of Memphis on high school graduates in Tennessee from 1990 to 2000, participants believed "most

dropouts are in vocational education; low achievers are in vocational education; it's a place of last resort for the kids" (Silverberg, Warner, Fong, & Goodwin, 2004). Critics of the study argued that there were participants considered at-risk students who experienced a high level of success in a variety of CTE programs. Silverberg et al. (2004) reported CTE was "not likely to be a widely effective strategy for improving academic achievement or college attendance without substantial modifications to policy, curriculum, and teacher training" (p. 2).

Weber (1986) conducted a national survey of high school sophomores. From the results, Weber (1986) determined that many students perceived CTE could significantly impact high school retention rates and raise high school graduation rates. Weber (1986) stated that a ratio of two traditional courses to one CTE course would have the greatest impact on raising graduation rates. Weber (1986) stated that plenty of data, quantitative and qualitative, existed that demonstrates the perception that CTE is a repository for underperforming students, which would skew the data around the effectiveness of the various programs.

In a casual-comparative study, Michel (2019) compared graduation rates of Missouri schools that did and did not provide CTE programs at an alternative high school from 2016 to 2018. Michel (2019) found no significant difference in graduation rates of students between schools that did and did not off an alternative high school to the state average. However, Michel (2019) stated there was a significant difference between the graduation rates of alternative high schools when compared to each other.

Summary

In this literature review, a timeline of significant legislation in the United States was established. Next, the review focused on CTE framework under the most current legislation and programs and support programs for schools. The review explored the various impacts of CTE on special student groups, particularly gender and ethnicity. Additionally, the review examined both positive and negative impacts CTE programs have had on students and their communities. Finally, the review explored the organization and goals of CTE programs in the state of Kansas. Chapter 3 includes the research design, selection of participants, measurement, and data collection procedures. The data analysis and hypothesis testing were described, as well as the limitations of the study.

Chapter 3

Methods

Four purposes were examined in this study. The first purpose of the study was to examine the differences in graduation rates of students between CTE completers and non-completers from Districts A, B, and C for the academic years 2015-2018. The second purpose of the study was to examine the differences between students' overall state average graduation rates and the graduation rates of CTE Completers. The third purpose of the study was to examine the differences between male and female students' overall state average graduation rates and the graduation rates of the corresponding male and female CTE Completers. The last purpose of the study was to examine the differences between overall state average graduation rates of three ethnic subgroups and the graduation rates of three ethnic subgroup CTE Completers. This chapter includes the research design, selection of participants, measurement, data collection procedures, data analysis, and hypothesis testing, and the limitations.

Research Design

This study was a quantitative analysis of archival data from KSDE from 2015 to 2018. A non-experimental, comparative design was used to examine the differences that may exist between the predetermined groups in terms of graduation rates. The members of the groups were not randomly assigned, meaning White, African-American, and Hispanic male and female students were not randomly assigned to grouped by chance or any other selection method. The independent variables were CTE completion status, ethnicity, and gender. The dependent variable was the reported graduation rate each year from 2015 to 2018.

Selection of Participants

The population for this study was the graduating classes of 2015, 2016, 2017, and 2018 in Kansas. Purposive sampling was used to identify participants. Lunenburg and Irby (2008) defined purposive sampling as sample selection based on the researcher's experience or knowledge of the group to be sampled and its fit to the study. The sample for this study was the graduating classes of 2015, 2016, 2017, and 2018 from Districts A, B, and C. Districts A, B, and C were chosen as they were similar in size, demographics, and each was defined as a large urban district by KSDE. The sample size for the study was 19 high schools each academic year from 2015 to 2018.

Measurement

CTE completer data was provided through the KSDE Data Governance Board. Data on graduation rate, gender, and ethnic breakdown was examined in this study. The data was received in multiple Excel spreadsheets.

For each district and building, Kansas school data is accessible through the KSDE Data Governance Board via electronic request. Each district is responsible for submitting data to the state to provide information for funding and compliance with federal and state guidelines. The instrument utilized for this study was the data report, for each district and building, presented in an Excel spreadsheet for all the variables received from KSDE. The instrument provided the data necessary to measure the variables specified in the four research questions and seven hypotheses. To ensure anonymity, districts and schools were assigned subject names that were used in the merging of graduation status, demographics, and CTE completer status.

Graduation rate. According to the Kansas Graduation and Dropout Information Handbook (KSDE, 2010), Kansas began using the four-year adjusted cohort graduation rate to calculate graduation rates for a given graduating class. The four-year adjusted cohort graduation method is utilized to track the movement of individual students. The four-year adjusted cohort begins with the incoming first-time ninth graders in a given year at a school or district. This cohort is continually adjusted. Students who transfer into the school or district are added to the cohort, while students who transfer out of the school or district are removed from the cohort. Students who drop out are not removed from a cohort (Kansas Graduation and Dropout Information Handbook, 2010). The four-year cohort graduation rate is the percentage of students in a cohort, adjusted for transfers into and out of the school, district, or state, who graduate with a regular high school diploma within four years of entering high school divided by the total number of students in the four-year adjusted cohort (KSDE, 2010). These cohorts, together with all transfers in and transfers out, were used to calculate the adjusted cohort graduation rates for student subgroups, such as gender and ethnicity.

Gender and ethnicity. School districts record demographic information during school enrollment. Districts require parents to register their students' demographic information, gender, and ethnicity. Districts report demographic information of student enrollment to the Kansas Department of Education by September 20 of a school year.

CTE completion status. School districts are required by the Perkins Act to report CTE participation levels and graduation rates of CTE participants, concentrators, and completers in the Consolidated Annual Report (CAR). The state report to the CAR must also contain demographic information for participants and concentrators (KSDE, 2017).

The KSDE archives all data reports in the Pathway Student Data Management System (KSDE, 2017).

Data Collection Procedures

Prior to requesting archival data from KSDE, Districts A, B, and C were contacted regarding the study. Since only archival data from the state were used in the study and the identity of the districts would remain anonymous, individual permission to complete the study was not needed from Districts A, B, and C. District A (see Appendix B), District B (see Appendix C), and District C (see Appendix D) were emailed on May 14, 2020, informing the department heads of each district's assessment and data departments of the intent and purpose of the study as a professional courtesy.

A request to conduct research was submitted to the Baker University Institutional Review Board (IRB) on August 4, 2020. Baker's IRB granted permission to conduct this study on August 5, 2020 (see Appendix E). Data collection began upon approval.

Data for the study were requested from KSDE on May 14, 2020, via the online data request to the KSDE Data Compliance Officer (see Appendix F). A special request had to be made as a report with the required data had not been generated previously. The data request was approved by the KSDE Data Governance Board on June 5, 2020 (see Appendix G). Submission of the IRB form to Baker University was made on August 5, 2020 and approval was received on the same day. IRB Approval was submitted to the KSDE Data Compliance Officer on August 5, 2020. The data report was received on August 7, 2020, from the KSDE Data Compliance Officer.

The data tool detailed graduation rate information disaggregated by district and schools within the district. The data tool detailed graduation rate information

disaggregated by CTE completer status: completer, concentrator, and participant. The data tool detailed graduation rate information disaggregated by ethnic groups: African - American, White, and Hispanic students. The data tool also detailed graduation rate information disaggregated by gender group: male and female students.

Data Analysis and Hypothesis Testing

The research questions, hypotheses, and data analyses summarized below guided this quantitative study. Additionally, the corresponding hypothesis testing follows each hypothesis.

RQ1. To what extent is there a significant difference in graduation rates of students between CTE completers and non-completers from District A, B, and C for the academic years 2015-2018?

H1. CTE completers would have a significantly different graduation rates than non-completers in District A, B, and C for the academic years 2015-2018.

An independent-samples *t* test was conducted to address H1. The mean graduation rate for the CTE completers group was compared to the mean of graduation rate for the non-completers group. An independent-samples *t* test was chosen for the hypothesis testing since it examines the mean difference between two mutually exclusive independent groups, and both means of two groups are continuous variables. The level of significance was set at .05. When appropriate, an effect size is reported.

RQ2. To what extent is there a significant difference in graduation rates of students between the overall state average graduation rates and the graduation rate of CTE Completers from District A, B, and C for the academic years from 2015 -2018?

H2. The graduation rate of CTE completers would be significantly different than the overall state average graduation rates from District A, B, and C for the academic years from 2015-2018.

A one-sample *t* test was conducted to address RQ2. Graduation rates of CTE completers were compared to the overall state average graduation rate. A one-sample *t* test was chosen for the hypothesis testing since it compares one group mean with a known value, and the group mean is a continuous variable. The level of significance was set at .05. When appropriate, the effect size is reported.

RQ3. To what extent is there a significant difference in graduation rates between the overall state average graduation rate for gender subgroups (male and female) and the graduation rate of the corresponding male and female CTE completers from District A, B, and C for the academic years of 2015-2018?

H3. Male CTE completers would have a significantly different graduation rate than overall state average graduation rates for male students from District A, B, and C for the academic years from 2015-2018.

H4. Female CTE completers would have a significantly different graduation rate than overall state average graduation rates for female students from District A, B, and C for the academic years from 2015 -2018.

Two one-sample *t* tests were conducted to address RQ3. Graduation rates of CTE male and female completers were compared to overall state average graduation rate for male and female students. A one-sample *t* test was chosen for the hypothesis testing since it compares one group mean with a known value, and the group mean is a

continuous variable. The level of significance was set at .05. When appropriate, the effect size is reported.

RQ4. To what extent is there a significant difference in graduation rates between the overall state average graduation rate for ethnic subgroups (African-American, Hispanic, and White) and the graduation rate of the corresponding African-American, Hispanic, and White CTE completers from District A, B, and C for the academic years of 2015-2018?

H5. African-American CTE completers would have a significantly different graduation rate than overall state average graduation rates for African-American students from District A, B, and C for the academic years from 2015 -2018.

H6. Hispanic CTE completers would have a significantly different graduation rate than overall state average graduation rates for Hispanic students from District A, B, and C for the academic years from 2015 -2018.

H7. White CTE completers would have a significantly different graduation rate than overall state average graduation rates for White students from District A, B, and C for the academic years from 2015 -2018.

Three one-sample *t* tests were conducted to address RQ4. Graduation rates of CTE African-American, Hispanic, and White completers were compared to overall state average graduation rates for African-American, Hispanic, and White students. A one-sample *t* test was chosen for the hypothesis testing since it compares one group mean with a known value, and the group mean is a continuous variable. The level of significance was set at .05. When appropriate, the effect size is reported.

Limitations

Lunenburg and Irby (2008) identified limitations as external factors out of the control of the researcher. Limitations for the current study included the following:

- Since the research focused on three urban Kansas school districts, the sample size may be too small to generalize the results to other districts in the same state or other states.

Summary

The purpose of this quantitative study was to examine graduation data from 2015-2018 in three large Midwestern school districts. Chapter 3 provided an overview of the quantitative non-experimental, comparative design to study this issue. This chapter also provided details about the population to be sampled, the collection of data, a description of the KSDE data tool, and the limitations of the study. The results of the quantitative analysis for this study are presented in Chapter 4.

Chapter 4

Results

The purpose of this study was to examine if the completion of a CTE program of study might impact the graduation rates of students from 2015 to 2018. This study also focused on the impact of completing a CTE program on student subgroups based on gender and ethnicity. Four purposes were addressed in this study.

Descriptive Statistics

Schools from Districts A, B, and C were included in this study. There were 18 schools for each of the four years of the study, and it resulted in a total sample size of 76. The average graduation rates for CTE completers and CTE non-completers were calculated for each demographic variable over a four-year average. Demographic variables included in this study were gender and ethnicity. The average graduation rate for CTE Non-Completers from 2015 to 2018 are in Table 1.

Table 1

Average Graduation Rate for CTE Non-Completers from 2015-2018

Groups	*M*	*SD*	*N*
All students	0.09	0.11	76
Male students	0.10	0.19	76
Female students	0.09	0.16	76
African-American students	0.07	0.18	76
Hispanic students	0.10	0.17	76
White students	0.07	0.13	76

The average graduation rate for CTE Completers from 2015 to 2018 are in Table 2.

Table 2.

Average Graduation Rate for CTE Completers from 2015-2018

Groups	*M*	*SD*	*N*
All students	0.90	0.18	76
Male students	0.84	0.29	76
Female students	0.86	0.28	76
African-American students	0.75	0.40	76
Hispanic students	0.83	0.29	76
White students	0.82	0.32	76

Hypothesis Testing

RQ1. To what extent is there a significant difference in graduation rates of students between CTE completers and non-completers from District A, B and C for the academic years 2015-2018?

H1. CTE completers would have a significantly different graduation rates than non-completers in District A, B and C for the academic years 2015-2018

An independent-samples *t* test was conducted to address H1. The results of the independent samples *t* test indicated a statistically significant difference between the two means, $t(150) = 33.21$, $p < .001$, $d = 5.42$. The average graduation rate for CTE completers ($M = 0.90$, $SD = 0.18$, $n = 76$) was significantly higher the average graduation rate for CTE non-completers ($M = 0.09$, $SD = 0.11$, $n = 76$). The research hypothesis was supported. CTE Completers graduate at a significantly higher rate on average than CTE non-completers in District A, B, and C. The effect size indicated a large effect.

RQ2. To what extent is there a significant difference in graduation rates of students between the overall state average graduation rates and the graduation rate of CTE Completers from District A, B, and C for the academic years from 2015 -2018?

H2. The graduation rate of CTE completers would be significantly different than the overall state average graduation rates from District A, B, and C for the academic years from 2015-2018.

A one-sample *t* test was conducted to address H2. The results of the one sample *t* test indicated no statistically significant difference between the average graduation rate of CTE completers and the test value, $t(75) = 1.42$ and $p = 0.16$. The average graduation rate for CTE completers ($M = 0.90$, $SD = 0.18$) was not significantly different than the overall state average graduation rate (0.87). The research hypothesis was not supported.

RQ3. To what extent is there a significant difference in graduation rates between the overall state average graduation rate for gender subgroups (male and female) and the graduation rate of the corresponding male and female CTE completers from District A, B, and C for the academic years of 2015-2018?

H3. Male CTE completers would have a significantly different graduation rate than overall state average graduation rates for male students from District A, B, and C for the academic years from 2015-2018.

A one-sample *t* test was conducted to address H3. The results of the one sample *t* test indicated no statistically significant difference between the average graduation rate for male CTE completers and the test value, $t(75) = -0.31$ and $p = 0.76$. The average graduation rate for male CTE completers ($M = 0.84$, $SD = 0.29$) was not significantly

different than the state average graduation rate for male students (0.85). The research hypothesis was not supported.

H4. Female CTE completers would have a significantly different graduation rate than overall state average graduation rates for female students from District A, B, and C for the academic years from 2015 -2018.

A one-sample *t* test was conducted to address H4. The results of the one sample *t* test indicated no statistically significant difference between the average graduation rate for female CTE completers and the test value, $t(75) = -0.96$ and $p = 0.34$. The average graduation rate for female CTE completers ($M = 0.86$, $SD = 0.28$) was not significantly different than the state average graduation rate for female students (0.89). The research hypothesis was not supported.

RQ4. To what extent is there a significant difference in graduation rates between the overall state average graduation rate for ethnic subgroups (African-American, Hispanic, and White) and the graduation rate of the corresponding African-American, Hispanic, and White CTE completers from District A, B, and C for the academic years of 2015-2018?

H5. African-American CTE completers would have a significantly different graduation rate than overall state average graduation rates for African-American students from District A, B, and C for the academic years from 2015 -2018.

A one-sample *t* test was conducted to address H5. The results of the one sample *t* test indicated no statistically significant difference between the average graduation rate for African-American CTE completers and the test value, $t(75) = -0.93$ and $p = 0.35$. The average graduation rate for African-American CTE completers ($M = 0.75$, $SD = 0.40$)

was not significantly different than the state average graduation rate for African-American students (0.79). The research hypothesis was not supported.

H6. Hispanic CTE completers would have a significantly different graduation rate than overall state average graduation rates for Hispanic students from District A, B, and C for the academic years from 2015 -2018.

A one-sample *t* test was conducted to address H6. The results of the one sample *t* test indicated no statistically significant difference between the average graduation rate for Hispanic CTE completers and the test value, $t(75) = 0.87$ and $p = 0.39$. The average graduation rate for Hispanic CTE completers ($M = 0.83$, $SD = 0.29$) was not significantly different than the state average graduation rate for Hispanic students (0.80). The research hypothesis was not supported.

H7. White CTE completers would have a significantly different graduation rate than overall state average graduation rates for White students from District A, B, and C for the academic years from 2015 -2018.

A one-sample *t* test was conducted to address H7. The results of the one sample *t* test indicated a statistically significant difference between the average graduation rate for White CTE completers and the test value, $t(75) = -1.97$, $p = 0.05$, and $d = 0.23$. The average graduation rate for White CTE completers ($M = 0.82$, $SD = 0.32$) was significantly lower the overall state average graduation rate for White students (0.89). The research hypothesis was supported. The average graduation rate of White CTE completers from District A, B and C is lower than the overall state average graduation rate of White students. The effect size indicated a small effect.

Summary

Chapter 4 contained the results of the study. First, using an independent-samples *t* test for H1, it was discovered that the average graduation rate of CTE completers was significantly higher than average graduation rate of CTE non-completers**.** Further, using one sample *t* tests for H2, H3, H4, H5, and H6, no significant difference between the average graduation rates of CTE completers from the selected subgroups and the overall state graduation rate of the respective selected subgroups was found. However, the results of H7 revealed the difference between the average graduation rate of White CTE completers was significantly lower than the overall average graduation rate of all White students. Chapter 5 includes a summary of the study, an overview of the problem, and a review of the research questions and methodology, as well as the major findings of the study. A discussion relates the findings to the literature and the conclusions.

Chapter 5

Interpretation and Recommendations

Chapter 5 contains the findings, conclusions, and recommendations for readers. The results of this study could be used as a resource for the implementation of a Career and Technical Education (CTE) program of study within a school system or in the planning the career path of a high school senior. This chapter includes a study summary, findings related to the literature, and conclusions.

Study Summary

The demand for highly skilled workers has created a greater emphasis on preparing high school graduates to be college and career ready in an ever-changing and competitive job market. A high school diploma is the minimum academic requirement for technical jobs (ACTE, 2014b). Career and Technical Education (CTE), formerly known as vocational courses of study, has become more popular and abundant throughout the nation (Hirschy et al., 2011). CTE programs at the high school level prepare students for college and careers by giving them practical experience in a range of occupational fields (Hirschy et al., 2011). In CTE courses at the high school level, students can earn certifications and credentials relevant to the existing job market (ACTE, 2014b). In the current study, District A, B, and C were compared by graduation rates of CTE completers and selected demographics to all the students' average graduation rates of those same demographics, in Kansas. This section provides an overview of the problem, the purpose statement and research questions, a review of the methodology, and the major findings.

Overview of the problem. A high school diploma has become the minimum requirement to enter the workforce or pursue post-secondary education (Saddler, et al. 2011). To be competitive in the ever-changing labor market, (DeWitt, 2007) stated schools must prioritize the preparation of self-sufficient high school graduates who are ready to attend post-secondary educational programs or enter directly into the workforce and an entry-level position. DeWitt (2007) stated that CTE was an overlooked and often ignored program due to historical and social stigmas as programs of study. Dewitt (2007) posited that CTE could increase graduation rates by creating a sustainable and equitable system. Districts A, B, and C provided the opportunity for students to complete CTE courses and programs. However, the overall graduation rates reported by Districts A, B, and C were below both the national and state average graduation rates of 80% from 2015 to 2018.

Purpose statement and research questions. Four purposes were examined in this study. The first purpose of this study was to examine the differences in graduation rates of students between CTE completers and non-completers from Districts A, B, and C for the academic years 2015-2018. The second purpose of this study was to examine the differences between students' overall state average graduation rates and the graduation rates of CTE Completers. The third purpose of this study was to examine the differences between male and female students' overall state average graduation rates and the graduation rates of the corresponding male and female CTE Completers. The final purpose of the study was to examine the differences between overall state average graduation rates of three ethnic subgroups and the graduation rates of three ethnic

subgroup CTE Completers. Four research questions were developed, and seven hypotheses were tested to address the current study's purposes.

Review of the methodology. This study is a quantitative analysis of archival data from KSDE from 2015 to 2018. A non-experimental, comparative design was used to examine the differences that may exist between the predetermined groups in terms of graduation rates. The independent variables were CTE completion status, ethnicity, and gender. The dependent variable was the reported graduation rate each year from 2015 to 2018. The population for this study was the graduating classes of 2015, 2016, 2017, and 2018 in Kansas. Purposive sampling was used to identify participants. The sample for this study was the graduating classes of 2015, 2016, 2017, and 2018 from Districts A, B, and C. The measurements used were the CTE completer data provided through the KSDE Data Governance Board. Data on graduation rate, gender, and ethnic breakdown were examined in this study. To test the first hypotheses, an independent-samples *t* test was chosen for the hypothesis testing since it examines the mean difference between two mutually exclusive independent groups, and the means of two groups are continuous variables. To test the remaining hypotheses, a one-sample *t* tests were chosen for the hypothesis testing because one group mean was compared with a known value, and the group mean is a continuous variable.

Major findings. The results of this study were mixed when determining significant differences in graduation rates of select demographics of CTE completers and the overall state averages. The findings in this section were organized in the order of the research hypotheses. The results of the data analysis supported H1 and H7. The results of the data analysis did not support H2, H3, H4, H5, and H6.

The results of the hypothesis testing revealed a significant difference in the overall graduation rates of CTE completers compared to non-completers. There was no evidence in the overall graduation rates of CTE completers from Districts A, B, and C to that of the overall graduation rates of CTE completers in Kansas. There was no evidence in the overall graduation rates of male CTE completers from Districts A, B, and C to that of the overall graduation rates of CTE completers in Kansas. There was no significant statistical difference in the overall graduation rates of female CTE completers from Districts A, B, and C to that of the overall graduation rates of CTE completers in Kansas. There was no significant statistical difference in the overall graduation rates of African-American CTE completers from Districts A, B, and C to that of the overall graduation rates of CTE completers in Kansas. There was no significant statistical difference in the overall graduation rates of Hispanic CTE completers from Districts A, B, and C to that of the overall graduation rates of CTE completers in Kansas. There was a significant statistical difference in the overall graduation rates of White CTE completers from Districts A, B, and C compared to the overall graduation rates of CTE completers in Kansas.

During the review of literature, the researcher found data from Bennet (2016), Yates (2008), and Orozco (2010) that might lead to a connection to graduation rates and students with exceptionalities. The current research focused on gender and ethnicity; however, Bennet (2016), Yates (2008), and Orozco (2010) suggest that students with exceptionalities and language learners have a significantly higher graduation rate when they complete a CTE program of study. It should also be noted that in most studies an

emphasis on proper funding, teacher knowledge, and ongoing professional development are referenced as requirements for effective CTE programs for all students.

Findings Related to the Literature

The findings in this section are organized in the order of the research questions. The links between the findings in the current study and previous studies' findings are presented and explained. Explored in this section are the findings and literature in the areas of impact on graduation rates on gender and ethnicity.

In the current study, results of the quantitative analysis provided evidence that there was a significant difference in the graduation rates of students completing CTE programs of study and those that did not complete CTE programs of study. This research was conducted using graduation data from three Kansas school districts from 2015-2018. The results of the study contradict the findings of Silverberg et al. (2004) who stated CTE would not have a significant impact on academic achievement. However, it should be noted that Silverberg et al.'s study also suggested that CTE would be highly beneficial if modifications to policy, curriculum, and teacher training were made. Multiple researchers (Chapman et al. 2011; Dare, 2006; Dougherty, 2016) have found completing CTE programs of study was positively linked with academic success, such as higher grades, test scores, and graduation rates which supports the results of the current study.

In the current study, results of the quantitative analysis provided evidence that there was no significant difference in the graduation rates of students completing CTE programs of study in District A, B, and C and the average graduation rate of CTE completers in Kansas. This finding supports the findings of Castellano et al. (2002), Neild et al. (2013), Cross and McGuire (2019), and Levesque (2008) who found that

students graduated at a much higher rate if they completed a CTE program of study compared to their non-completer classmates. However, Castellano et al. (2002) and Cross and McGuire (2019) examined CTE concentrators rather than only full completers. Neild et al. (2013) examined completer status.

In the current study, results of the quantitative analysis provided evidence that there was no significant difference in the graduation rates of male students completing CTE programs of study in District A, B, and C, and the average graduation rate of male CTE completers in Kansas. In the current study, results of the quantitative analysis provided evidence that there was no significant difference in the graduation rates of female students completing CTE programs of study in District A, B, and C, and the average graduation rate of female CTE completers in Kansas. This finding contradicts the findings of Neilson (2016); however, Neilson's study was a qualitative study that examined student perceptions of effectiveness. Neilson (2016) focused primarily on Native American males. The results did support the findings of Cardin (2015), who examined the effectiveness of CTE program completion on Texas graduates. Cardin (2015) found no significant difference in the sample school districts researched compared to the rest of the state. The findings of Cardin (2015) parallel the results of this current study. Both studies found no significant difference in graduation rates of CTE completers when compared to overall state graduation rates for CTE completers. Students that complete CTE programs, regardless of the school district, are graduating at a similar increased rate compared to CTE non-completers.

In the current study, results of the quantitative analysis provided evidence that there was no significant difference in the graduation rates of African-American students

completing CTE programs of study in District A, B, and C and the average graduation rate of African-American CTE completers in Kansas. In the current study, results of the quantitative analysis provided evidence that there was no significant difference in the graduation rates of Hispanic students completing CTE programs of study in District A, B, and C and the average graduation rate of Hispanic CTE completers in Kansas. This result supports the findings of Neilson (2016) and Cardin (2015), who also found no difference in graduation rates when compared to the state. However, both studies did show that the average graduation rate of CTE completers was higher than non-completers based on demographics. Horton (2019) expressed similar findings based on ethnicity, as well.

In the current study, the results provided evidence that there was a significant difference in the graduation rates of White students completing CTE programs of study in District A, B, and C and the average graduation rate of White CTE completers in Kansas. This result does not follow the literature on the impact based on ethnicity. These results bare further research on additional variables that could be influencing the data. ACTE (2019) stated that funding was targeted to increase overall minority and female student enrollment in CTE courses. Further suggestions for research are presented based on this result.

Conclusions

The following section includes conclusions made from the current study on the impact of CTE program completion on graduation rates. The study yielded mixed results. Implications for action and recommendations for future research are discussed in the following sections, followed by concluding remarks.

Implications for action. The results of the current study may have implications for future actions in District A, B, and C. The results of the current study suggest that District A, B, and C should recommend that all students complete a CTE program of study. There is a significant difference in graduation rates between students who complete a program of study and those who do not complete a program of study.

Currently, District A, B, and C provide many CTE programs of study. However, to increase the number of students enrolling in CTE programs, District A, B, and C should recommend providing a variety of CTE programs from the 16 career clusters. By increasing the variety of options for students, Districts A, B, and C may increase student interest in CTE.

Recommendations for future research. The results of the current study are limited. This research could be conducted again, with some modifications, to learn more about the impact of CTE program completer on academic achievement. In future research, the sample sizes for Districts should be increased. Rather than use only three school districts in Kansas, the research could be expanded to include all school districts. Utilizing a large sample of districts would create a larger sample of individual schools to examine.

The current study only included data for 2015-2018 school years. The research could be extended to include a greater number of years. The inclusion of multiples years of data would allow the researcher to compare the results for a longer time and determine whether CTE program completion has become more effective over time.

The current study only included data from CTE completers and non-completers. The research could be extended to include additional CTE program statuses: concentrator

and participant. The inclusion of the additional program completion statuses would allow the researcher to compare the impact of CTE programs on graduation rates based on a greater range of CTE courses completed.

The current study only included data from African-American, Hispanic, and White students. The research could be extended to include a greater variety of identified ethnic backgrounds. The inclusion of additional ethnicities would allow the researcher to compare the impact of CTE program completion on a greater variety of students and be more inclusive.

In future research, the study could be extended to include more differentiation of special student groups. These select subgroups could include low socioeconomic status, special education, and English language learners. The inclusion of the additional selective subgroups would allow the researcher to compare the impact of CTE program completion on the graduation rates on a greater variety of students.

The current study compared graduation rates of CTE completers based on a single variable. The research could be extended to include multiple variable categories. Select subgroups could be extended to have two or three variables. An example would be a student categorized as low socioeconomic status who is White and female. This inclusion would allow for a more detailed analysis of the impact on CTE program completion on a more detailed subgroup.

In future research, the study could be extended to examine specific CTE programs. District A, B, and C did not have programs in all 16 career clusters. The research could be extended to examine each cluster or a particular program of study. This inclusion would allow the research to compare the impact on particular CTE

program completion on graduation rates. This addition would also allow the research to look for a possible correlation between CTE programs, student enrollment, and the impact of graduation rates.

Finally, in future research, the study could be extended to examine additional areas of student achievement, including grades, ACT scores, and college acceptance. The inclusion of this data would allow the researcher to replicate the study and look for additional connections to CTE program completion and the chosen indicator of student achievement.

Concluding remarks. Results of the current study indicate that CTE programs of study are effective in graduating high school seniors and may be effective at increasing the graduation rate of a school district. With school districts facing increased demands from both state and federal mandates and limited budgets to implement these mandates, administrators should examine the overall effectiveness of their CTE program before determining which programs to fund. In addition to material resources, schools must devote the proper funds to training and professional development of teaching staff to provide high-quality instruction. Leaders of local school districts, principals, teachers, and guidance counselors who work with high school students, can help increase the number of students graduating from high school by enrolling them in program areas where students have an interest and are likely to succeed, such as CTE courses

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Appendices

Appendix A: CTE 16 Career Clusters

There are 16 Career Clusters in the National Career Clusters Framework, representing 79 Career Pathways:

- Agriculture, Food & Natural Resources
- Architecture & Construction
- Arts, A/V Technology & Communications
- Business Management & Administration
- Education & Training
- Finance
- Government & Public Administration
- Health Science
- Hospitality & Tourism
- Human Services
- Information Technology
- Law, Public Safety, Corrections & Security
- Manufacturing
- Marketing
- Science, Technology, Engineering & Mathematics
- Transportation, Distribution & Logistics

Appendix B: Intent to Complete Research - District A

Intent to Complete Research - Baker University Doctoral Dissertation

Parker, Kurt [redacted]

Reply all

Sent Items

Flag for follow up. Start by Thursday, May 14, 2020. Due by Thursday, May 14, 2020.

[redacted]

I wanted to reach out to inform you of my intent to request archival data from KSDE for Kansas school districts for the purpose of completing work for my doctoral dissertation with Baker University. I wanted to inform you that your school district will be included in this request. Your district's confidentiality and privacy will be maintained and all identifying information will be removed. No action by your school district is required.

This study examines the effects of career and technical education (CTE) completion on high school graduation rates from 2015 -2018. The information requested will include student demographics, school demographics, graduation rates, CTE enrollment, and CTE completion rates. A copy of the IRB Approval from Baker University can be provided for your records upon request. A copy of the final dissertation with any and all findings can also be provided upon defense. If you have any questions, comments or concerns, please feel free to contact me.

Thank you for your time and consideration in this matter,

Kurt Parker
Doctoral Candidate Baker University

Appendix C: Intent to Complete Research - District B

Intent to Complete Research - Baker University Doctoral Dissertation

Parker, Kurt [redacted]

Reply all

Sent Items

Flag for follow up. Start by Thursday, May 14, 2020. Due by Thursday, May 14, 2020.

[redacted]

I wanted to reach out to inform you of my intent to request archival data from KSDE for Kansas school districts for the purpose of completing work for my doctoral dissertation with Baker University. I wanted to inform you that your school district will be included in this request. Your district's confidentiality and privacy will be maintained and all identifying information will be removed. No action by your school district is required.

This study examines the effects of career and technical education (CTE) completion on high school graduation rates from 2015 -2018. The information requested will include student demographics, school demographics, graduation rates, CTE enrollment, and CTE completion rates. A copy of the IRB Approval from Baker University can be provided for your records upon request. A copy of the final dissertation with any and all findings can also be provided upon defense. If you have any questions, comments or concerns, please feel free to contact me.

Thank you for your time and consideration in this matter,

Kurt Parker
Doctoral Candidate Baker University

Appendix D: Intent to Complete Research - District C

Intent to Complete Research - Baker University Doctoral Dissertation

Parker, Kurt [redacted]

Reply all

Sent Items

Flag for follow up. Start by Thursday, May 14, 2020. Due by Thursday, May 14, 2020.

[redacted]

I wanted to reach out to inform you of my intent to request archival data from KSDE for Kansas school districts for the purpose of completing work for my doctoral dissertation with Baker University. I wanted to inform you that your school district will be included in this request. Your district's confidentiality and privacy will be maintained and all identifying information will be removed. No action by your school district is required.

This study examines the effects of career and technical education (CTE) completion on high school graduation rates from 2015 -2018. The information requested will include student demographics, school demographics, graduation rates, CTE enrollment, and CTE completion rates. A copy of the IRB Approval from Baker University can be provided for your records upon request. A copy of the final dissertation with any and all findings can also be provided upon defense. If you have any questions, comments or concerns, please feel free to contact me.

Thank you for your time and consideration in this matter,

Kurt Parker
Doctoral Candidate Baker University

Appendix E: Baker University IRB Approval to Conduct Research Letter

BAKER UNIVERSITY
Own Confidence

Baker University Institutional Review Board

August 5th, 2020

Dear Kurt Parker and James Robins,

The Baker University IRB has reviewed your project application and approved this project under Exempt Status Review. As described, the project complies with all the requirements and policies established by the University for protection of human subjects in research. Unless renewed, approval lapses one year after approval date.

Please be aware of the following:

1. Any significant change in the research protocol as described should be reviewed by this Committee prior to altering the project.
2. Notify the IRB about any new investigators not named in original application.
3. When signed consent documents are required, the primary investigator must retain the signed consent documents of the research activity.
4. If this is a funded project, keep a copy of this approval letter with your proposal/grant file.
5. If the results of the research are used to prepare papers for publication or oral presentation at professional conferences, manuscripts or abstracts are requested for IRB as part of the project record.
6. If this project is not completed within a year, you must renew IRB approval.

If you have any questions, please contact me at npoell@bakeru.edu or 785.594.4582.

Sincerely,

Nathan D. Poell

Nathan Poell, MLS
Chair, Baker University IRB

Baker University IRB Committee
Sara Crump, PhD
Nick Harris
Christa Manton, PhD
Susan Rogers, PhD

Appendix F: KSDE Data Request Submission and Confirmation

Submission

Julie Cook <jvcook@ksde.org>
Thu 5/14, 8:32 AM
Parker, Kurt; DataRequest@ksde.org; czeller@ksde.org

Reply all

CAUTION: This email originated from outside of KCKPS and **did not come from a user in the district**. Do not click links, open attachments, or reply to this email unless you recognize the sender and know the content is safe.

Thank you for your Data Request Submission. We will review the requirements of your request and get back with you as soon as possible. Thank you.

First Name:	Kurt
Last Name:	Parker
Email:	kurt.parker@kckps.org
Affiliation:	Baker University
Affiliation Type:	Other
If Other (Please describe):	University - Doctoral Program
Address:	4920 Glenwood St. Apt. 1
City:	Mission
State:	KS
ZIP:	66202
Phone Number:	913-314-5604
When is the data needed:	5/30/2020
Detailed Description:	Requesting archival data for the completion of dissertation research comparing the graduation rates fo CTE completers versus non-completers in Kanas school districts. . Requesting data from 2014-2015 to 2017-2018 school year for Topeka Public Schools, Wichita Public Schools and Kansas City Kansas Public Schools. Data requested pertains to CTE: 1. # of students achieiving CTE completer, concentrator and participant status from each graduating class 2. Population size and demographics of each graduating class from 2014-2015 to 2017-2018 for each fo the three school districts. 3. Graduation rates fory student demographics (gender, ethncity, SES) from each graduation class from 2014-2015 to 2017-2018 for each fo the three high schools. 4. Graduation rates of CTE completers, CTE concentrators, and CTE participants by demographics (gender, ethnicity) for all graduating classes starting in 2014-2015 to 2017-2018 for the three school districts. 5. State average graduation rates by demographics (gender, ethnicity) for all graduating classes starting in 2014-2015 to 2017-2018. 6. State average Graduation rates of CTE completers, CTE concentrators, and CTE participants by demographics (gender, ethnicity) for all graduating classes starting in 2014-2015 to 2017-2018.
Please Select Format:	Excel
If Other Format (please describe):	SPSS also
Data Suppression:	No Cell Suppression - I need all individual records. If Restricted Data are requested, a Request for Personally-Identifiable Student Info document must be approved prior to granting access to this data.
Public Benefit from this project:	This data will be used for completion of dissertation research at Baker University. The purpose of the research is to measure to what extent achieving CTE completion status has on graduation rates of urban high schools in Kansas. The study will also examine if CTE completion has a greater effect on graduation rates of minority students. Preparing our students to engage in post-secondary study and/or enter a much higher skilled work force is our goal as educators. A high school diploma is the stepping stone to a student's future. It is the hope that this data will show the denefit of CTE programs in Kansas particularly for our minority students to achieve their goals.
Reason:	No research for a dissertaion at Baker Unviersty.
Created at:	5/14/2020 8:33 AM

Confirmation

[Not from USD500]RE: Thank you for your Data Request

Julie V. Cook <jvcook@ksde.org>
Fri 5/29, 2:38 PM
Parker, Kurt; DataRequest <DataRequest@ksde.org>; Charlotte Zeller <czeller@ksde.org>; Julie V. Cook <jvcook@ksde.org>

Reply all

CAUTION: This email originated from outside of KCKPS and **did not come from a user in the district**. Do not click links, open attachments, or reply to this email unless you recognize the sender and know the content is safe.

Kurt,
Kansas State Department of Education has received this data request and assigned it #699 in our internal tracking system.

Please be advised that KSDE has implemented a fee structure with our data requests, and this request will go through a legal review and the KSDE Data Governance Board that meets monthly will review it to commit resources to fill it as well as assign a fee based on an estimate by the researchers within KSDE. The board meets again on June 4th.

I will be in touch as this request moves throughout the process.

Thank you,

KANSAS STATE DEPARTMENT OF EDUCATION
900 S.W. Jackson Street, Suite 102
Topeka, Kansas 66612-1212

Julie V. Cook
Project Manager/Data Compliance Officer
Information Technology
(785) 296-3300
jvcook@ksde.org
www.ksde.org

Kansas leads the world in the success of each student.

Appendix G: KSDE Data Request Approval

From: Julie V. Cook <jvcook@ksde.org>
Sent: Friday, June 5, 2020 11:17 AM
To: Parker, Kurt
Cc: DataRequest; Charlotte Zeller
Subject: [Not from USD500]RE: Thank you for your Data Request

WARNING: The sender of this email could not be validated and may not match the person in the "From" field.

CAUTION: This email originated from outside of KCKPS and **did not come from a user in the district**. Do not click links, open attachments, or reply to this email unless you recognize the sender and know the content is safe.

Kurt,
Your data request has been deemed legal and the KSDE Data Governance Board voted to approve your request and fulfill it upon payment of $672. The estimate for this data request is 12 hours and we can commit to having it completed 45 days after receipt of payment. The fee the board adopted is $56 an hour, thus the $672 fee.

Once we receive the payment we will begin working on your data request. KSDE at this time is only able to take checks and/or money orders. You can submit the **payment payable to KSDE (Kansas Department of Education)** to my attention at the below address:

Kansas Department of Education
c/o Julie Cook
Information Technology
900 SW Jackson St.
Topeka, KS 66612

Please let me know if you have any questions or concerns.

KANSAS STATE DEPARTMENT OF EDUCATION

Julie V. Cook
Project Manager
Information Technology
(785) 296-3300