January 2021

Relationship Between Secondary Industry Certifications and Employment in the Particular Credentialed Area

Kevin R. Cook
Eastern Kentucky University

RELATIONSHIP BETWEEN SECONDARY INDUSTRY CERTIFICATIONS AND EMPLOYMENT IN THE PARTICULAR CREDENTIALED AREA

BY

KEVIN COOK

DISSERTATION APPROVED:

Charles Hausman (Mar 29, 2021 10:51 EDT)

Chair, Advisory Committee

Ann H. Burns (Mar 29, 2021 10:48 EDT)

Member, Advisory Committee

Charles Myers (Mar 29, 2021 11:02 EDT)

Member, Advisory Committee

Dean, Graduate School

STATEMENT OF PERMISSION TO USE

In presenting this dissertation in partial fulfillment of the requirements for a doctoral degree at Eastern Kentucky University, I agree that the Library shall make it available to borrowers under rules of the Library. Brief quotations from this document are allowable without special permission, provided that accurate acknowledgments of the source are made. Permission for extensive quotation from or reproduction of this document may be granted by my major professor. In [his/her] absence, by the Head of Interlibrary Services when, in the opinion of either, the proposed use of the material is for scholarly purposes. Any copying or use of the material in this document for financial gain shall not be allowed without my written permission.

Signature:

X Kevin Cook
Kevin Cook (Mar 29, 2021 11:20 EDT)

Date: March 29, 2021

RELATIONSHIP BETWEEN SECONDARY INDUSTRY CERTIFICATIONS AND EMPLOYMENT IN THE PARTICULAR CREDENTIALED AREA

BY

KEVIN R. COOK

Submitted to the Faculty of the Graduate School of
Eastern Kentucky University
in partial fulfillment of the requirements for the degree of

DOCTORATE OF EDUCATION

2020

DEDICATION

This dissertation is dedicated to my wife Auburn, children Gavin, Winston, and Gracyn and my parents. In addition to the personal goal of earning a Ph.D., I chased this dream for my family. For my children to dream and understand the importance of life-long learning. For my parents who instilled the same mentality in me. And to my beautiful, loving wife who has supported me along this and all of our journeys.

ACKNOWLEDGEMENTS

I would like to thank my family for their incredible support through this journey. To my mom and dad, thank you for pushing me and teaching me from an early age to possess a sense of pride in my work and now for continuing that support as well as providing care for my children during journeys such as this. To my children Gavin, Winston, and Gracyn, I desire that you too strive to reach lofty goals and work toward them with the same competitive drive you display in other aspects of your lives. Finally, and most importantly, thank you to my wife Auburn for unwavering support and love. This accomplishment, with three children busy in their many activities, would not have been possible without your love and support.

To my dissertation committee Chair Dr. Charles Hausman in particular, and also members Dr. Ann Burns, and Dr. Charles Myers, I greatly appreciate your efforts and support in assisting me through this process. Your guidance and expertise were well received and that support continued to push me.

ABSTRACT

Career and Technical Education has long been at the forefront of education and education restructuring. Federal and state legislation have provided guidance and reform to assist in the educating of students in preparation for higher learning and work opportunities. However, there is a lack of information regarding the relationship between preparation of students during high school and employment post-graduation. Particularly in Kentucky, accountability changes in secondary schools have placed greater emphasis on Career and Technical Education certificate attainment as a means to represent transition readiness for graduates. In this bivariate correlation analysis, industry certifications earned by graduating secondary students and the employment in their particular credentialed area post-graduation were studied over a five-year span and were found to show a lack of a relationship in the Cumberlands Local Workforce Area of Kentucky. Sample t-tests were run to determine the significance of certification and employment increases over the same time period. The certifications earned showed a significant increase while the employment rates of secondary graduates provided too little data to show a significant relationship. Certifications represent the readiness of graduates for employment in their area, yet employment of those graduates in their credentialed area was not being reported. While many factors exist, such as furthering of education prior to job seeking, there is concern that certified individuals are not gaining employment post-graduation in the Cumberlands Workforce Area of Kentucky.

TABLE OF CONTENTS

LIST OF TABLES

TABLE PAGE

LIST OF FIGURES

Chapter 1: Introduction

Determining the relationship between high school industry certifications and actual employment of graduates could be beneficial knowledge for industry and educational institutions. This proposal was designed to identify the particular topic and provide the purpose for the research. Research questions and significance were identified followed by pertinent literature and the methodologies intended to be used in the research.

Research Topic

Over the next several years, the job outlook in Kentucky shows an increase in the projected employment opportunities within the state according to the Education and Workforce Development Cabinet and the Kentucky Center for Statistics (KY Center for Statistics, 2019; Workforce Intelligence Branch, 2016). Employment and unemployment, constantly at the center of national and state conversation, has been a driving factor in determining education needs for state and regional areas within a state. Current research conducted by the Kentucky Center for Statistics indicated particular job areas in Kentucky that will have the greatest need for additional employees through the year 2026 (KY Center for Statistics, 2019). Job transfers, as well as job exits due to possible retirements, have been considered in the research, indicating there will be significant employment openings in multiple areas. Some of the greatest needs are concentrated in a few common areas including healthcare, transportation, and manufacturing (KY Center for Statistics, 2019; Workforce Intelligence Branch, 2016).

In response to the upcoming workforce needs, Kentucky began conversations around the state and developed a resource focused on providing guidance for and information about the 'skilled jobs' that will be, and are currently, in high demand (Kentucky Education & Workforce Development Cabinet, 2019). Of the previously mentioned high demand areas in healthcare, transportation, and manufacturing, secondary education can play an important role in preparing potential employees. Education through secondary schools and post-secondary schools are able to provide students with opportunities to earn credentials specific to a program of study, which enables the employer to hire someone with a particular certification (Kentucky Education & Workforce Development Cabinet, 2019).

Various authors (Arum & Shavit, 1995; Stevenson, 2003) have acclaimed the importance of career and technical education in preparing students for the workforce and the advantages afforded to vocationally trained students when entering the workforce, while another author (Rosenbaum, 2001) painted a less rosy picture, declaring a disconnect between education and the business world. There appeared to be a scarcity of information in linking credentials earned by secondary students to employment within the credentialed area, which was inopportune if Kentucky education institutions desired to provide potential trained 'skilled labor' employees for business and industry.

This study was designed to contribute to the conversation and explore the impact of credential earning – specifically industry certificates earned through secondary education in skilled trade areas – on employment in industry. This study examined the

number of industry certifications earned by secondary students compared to the number of those same secondary students gaining employment in their skilled trade certification area. This examination highlighted the relationship existing between credentialed secondary graduates and their employment in the credentialed area. Analysis could contribute to the focus of secondary schools in deciding which skilled labor areas are most successful in hiring credentialed graduates and may create an awareness of potential employee availability of graduates for employers needing credentialed workers. Data for this study was considered for the Commonwealth of Kentucky as well as for the local workforce area Cumberlands Region of Kentucky. Statistical results indicated the direction and strength of correlation between credentials and early employment that may further or change the conversation around the skilled labor employment opportunities and certified potential employees.

Purpose Statement

The purpose of this study was to examine the bivariate correlation between industry credentials, specifically in high demand sectors, earned during high school and the post-graduation employment rate for those students in the related job area. Two research questions were designed to gather data on industry certifications earned as well as post-graduation employment. The subsequent data from the first two research questions was used to determine the correlation between those variables. The independent variable for the first two research questions was the same in each question and defined as the years for the study. The dependent variable for the first research question was defined as an earned credential in secondary institutions in Kentucky,

specifically focusing in the Cumberlands Region of Kentucky. An earned credential for a secondary student typically represented enrollment in and passing of multiple courses in a program of study followed by the successful completion of the appropriate industry certification in a particular vocational education area as recognized by the Kentucky Department of Education transition readiness requirements. The dependent variable for the second research question was defined as post-graduation employment in the particular program area of the earned credential. The study was designed to utilize five years of data from secondary institutions, ranging from the 2013-2014 school year to the 2017-2018 school year. Each of the research questions had an individual paired sample t-test ran on them. The ensuing question subsequently determined the bivariate correlation between the variables. Although it was not examined in this study, post-secondary data could be considered an intervening variable and may have affected the employment rate, when measured immediately after high school graduation, since some secondary graduates elect to continue their education prior to gaining employment in the program of study area.

Research Questions

1. Is there a significant difference in the number of industry certifications earned from graduating students in the Cumberlands Region of Kentucky between the school years 2013-2014 and 2017-2018?
2. Is there a significant difference in the number of students gaining employment in their credentialed area between the school years 2013-2014 and 2017-2018 in the Cumberlands Region of Kentucky?

3. What is the correlation between number of industry certifications earned and the number of students gaining employment in their credentialed area between the school years 2013-2014 and 2017-2018?

Significance of Study

The Commonwealth of Kentucky, secondary, and post-secondary institutions continually desired to understand the importance of preparing students for the workforce through Career and Technical Education opportunities. The Kentucky Education and Workforce Development Cabinet created a tool called *In Demand* that could be used by industry in the recruitment and placement of employees in the high demand sectors (Kentucky Education & Workforce Development Cabinet, 2019). This tool was intended to help meet employer demand as the needs of the workforce continued to change (Kentucky Education & Workforce Development Cabinet, 2019). Each year, graduating students may have decided to transition into the workforce or further their education with post-secondary training/education. This research was aiming to provide data on the number of industry certifications earned during a five-year period of high school students and the data on how many graduated students entered the workforce in their credential matching area, most specifically for the Cumberlands Region of Kentucky. Due to the incredibly high number of industry certifications available in Kentucky, this research focused on those employment opportunities considered to be in high demand and fastest growing. The high demand sectors included the jobs in the areas of health care, manufacturing, office and

administrative support, and transportation; however, the office and administrative support jobs are anticipated to grow at the slowest rate (KY Center for Statistics, 2019). Some students, post-graduation, may have gained employment outside of their certified area, which is data that fell outside the parameters of this study.

According to Tamar-Belgraves (2016), while industry certifications have been available and serviceable for many years, there was a disconnect between the high school training and the ultimate goal of workforce transition. Perhaps this disconnect between high school and workforce was due to societal perceptions that still seemingly separated industry certifications from post-secondary education, influencing some to pursue degrees after high school prior to entering the workforce. The pursuit of post-secondary degrees understandably occurred as a career advancement option for some students. Furthermore, the degree attainment, as opposed to just a certification, may have been due to the differing regulations that existed. Tamar-Belgraves (2016) noted, "each certifying agency is governed by different laws that must be adhered to by the districts and schools, and each carry certain perceptions as to their value in the community, state, or nation as a whole" (p.13).

By comparing the number of credentialed graduates to those gaining employment after graduation, educators and industry leaders will be more qualified to address the value of the industry certifications earned in secondary education. Proper credentials provide eligibility for employment and as unemployment was an issue widely discussed in society, understanding the number of students who made the successful transition from high school to workforce was an important aspect of the

educational process. The results of this research may be able to provide insight, showing either a strength or weakness in the workforce transition process post-high school.

Methodology Framework

The purpose of this study was to examine the industry certifications of students in the Cumberlands Region of Kentucky, specifically the bivariate correlation between industry credentials earned during high school and the post-graduation employment rate for those students in the related job area. This study included results from high school graduates within the Cumberlands Region of Kentucky ranging from the 2013-14 school year to the 2017-2018 school year. Kentucky State Data reports were utilized to indicate student success in earning an industry credential and subsequent employment matching their program area. Part of this data was also used as a portion of the accountability model for the Commonwealth of Kentucky, therefore individuals were not identified, but rather groups of individuals identified through the student data collection system for Kentucky, Technical Education Database System (TEDS), and as reported through the Kentucky Center for Statistics (KYSTATS) (Christian, 2019; KY Center for Statistics, 2019).

This correlational quantitative study utilized information reported by secondary schools to the Commonwealth of Kentucky and subsequently organized through the Kentucky Department of Education (KDE) and its associates. While various reports were regularly made public by the Kentucky Department of Education, the particular information gathered and the correlation between the variables examined were intended

to be able to provide unique relational information for educators, employers, and furthermore, policy makers in Kentucky regarding employment of graduates in their programs of study. The availability of data and the quick turnaround of reporting was able to aid in the analysis of more recent secondary and workforce results.

The study determined the direction and strength of correlation that existed between secondary credentials and subsequent employment for graduates who possessed a career and technical education certification. The independent variable was the school years during the five-year span. The dependent variable was different for each of the first two research questions. For question one it was the number of industry certifications earned by the graduates during the five-year span. The administering of certification testing was reliant upon individual schools, consequently there could have been various factors determining which students were eligible for credentialing. However, this study focused on those that had received their certification, regardless of pathway status. The dependent variable in question two was the number of credentialed graduates who were employed in the same area as the program pathway certification. Clearly, there were many factors that influenced the dependent variable in this study. For example, personal decisions by graduates on employment seeking versus furthering their education, as well as other additional factors were in existence. Those factors were beyond the scope of this particular study. However, exploration of those factors might lead to the need for a future quantitative study of graduates in which they are questioned on their reasoning for employment seeking versus not employment seeking. Finally, there was an analysis

performed to determine the correlation that existed between earned industry certifications and post-graduation employment.

At the time, there was a great amount of data available on and for secondary schools in Kentucky. However, a lack of relational information was found by this researcher about the data in this specific area, also noted by other researchers exploring relationships between Career and Technical Education (CTE) and employment around the United States (Fletcher & Tyson, 2017; Tamar-Belgraves, 2016). More recently, Kentucky had begun to expand data and was beginning to provide more information about the data and its meaning for future employment (KY Center for Statistics, 2019). However, those reported data on employment and earned industry certifications seemed to focus on raw surface numbers and percentages, while this study desired to discover what kind of specific correlation existed, if any, between industry certifications and employment of graduates in the credentialed area. Other research related to this area had shown mixed results as some claimed good long-term employment relationships and some claimed poor employment relationships with career and technical education (Fletcher & Zirkle, 2009; Meer, 2007).

The data was collected from the instrument utilized by KDE, the TEDS database, and a reporting format titled KYSTATS. Data from each Kentucky public school was reported into the database yearly, which allowed for KDE and its employees to construct information about schools and apply toward their state accountability scores (Office of Standards, Assessment and Accountability, 25). Due to the nature of the database and the accountability placed on schools for reporting data, I felt the

instrument for collection was valid for further research, and would be the vehicle for data collection in this study.

Conclusion

Determining the relationship between high school industry certifications and actual employment of graduates could be beneficial knowledge for industry and educational institutions. This proposal was designed to determine the type of bivariate correlation that existed between high school credentialing and employment postgraduation. Research questions and the correlation significance were identified and reported as well as a thorough investigation into pertinent literature related to the topic in the research.

Chapter 2: Literature Review

Introduction

For an increased understanding of the role of Career and Technical Education and industry certifications, literature on the subject was reviewed. This chapter was written to first provide a background in career and technical education, highlighting important legislation as well as the relevance and role of Career and Technical Education. Next, this chapter was written to discuss the importance of Career and Technical Education opportunities for the individual, discussing topics such as the labor market and earnings in addition to career choices through Career and Technical pathways. Finally, a review of how organizational changes in Kentucky have influenced Career and Technical Education and the opportunities afforded through it was discussed from the literature reviewed.

Background of Career and Technical Education

Career and Technical Education has been a part of American Education for many decades. It has provided a source of political and educational focus at different times. The legislation for funding of Career and Technical Education, as well as the relevance as evolved since its inception. Also, the certifications and role has grown into what currently serves students today. This section provides information concerning the background and development of Career and Technical Education.

Federal Legislation

Career and Technical Education has long been an avenue for purposes of educating and potential job training for students. Prior to a time of online interviews,

job monitoring through personal electronic devices, and factories full of robotic machinery, educating students for their future was a focus, just as it remains today locally, nationally, and internationally. Evidence of this can be found through legislative actions. Lazerson and Grubb (1974) gave credit to the Commission on National Aid to Vocational Education as a critical document for the enhancement and promotion of vocational education. During this time, over one-hundred years ago, the work of the Commission positioned the foundation for federal funding according to Lazerson and Grubb. The Commission made multiple recommendations which were summarized in their work:

> Vocational education will indirectly but positively affect the aims and methods of general education: (1) By developing a better teaching process through which the children who do not respond to book instruction alone may be reached and educated through learning by doing; (2) by introducing into our educational system the aim of utility, to take its place in dignity by the side of culture and to connect education with life by making it purposeful and useful. (Lazerson & Grubb, 1974, p. 117)

This work led to Federal Legislation which has since influenced vocational education. LaFollette (2011), described the subsequent passage of the Smith-Hughes Act of 1917 as perhaps the most important legislation in the history of career and technical education. Public funding for vocational education was granted through this federal legislation and since that time, the federal government has continued to support vocational or career and technical education (Threeton, 2007).

More federal legislation, also significant to Career and Technical Education, includes the Vocational Education Act of 1963. This Act was amended in 1968 and again in 1976 and provided stipulations for the use of the funds based on education, needs, and other socioeconomic factors (Threeton, 2007). This practice of addressing economic and social demands of the United States is also found in the Carl D. Perkins Act of 1984. The Carl D. Perkins Act intended to provide access to all students and did so by amending the Vocational Education Act of 1963 and by replacing the amendments to it from 1968 and 1976. (Threeton, 2007).

Most recently, in 2018, the Carl D. Perkins act was amended for the fifth time. Known as Perkins V, it reflects the 100-year federal commitment to Career Technical Education (CTE) by providing federal support for Career and Technical Education programs and focuses on improving the academic and technical achievement of Career and Technical Education students, strengthening the connections between secondary and postsecondary education and improving accountability (Strengthening Career and Technical Education for the 21st Century Act, 2019, p. 1).

The history of Career and Technical Education shows that it originally was designed for the development of children who might not respond to the traditional textbook type instructional setting; it would allow them to learn by doing and make their education more "purposeful and useful" (Lazerson & Grubb, 1974).

However, as society has progressed and amendments have been made to federal legislation, the combination of vocational education and traditional academics has intertwined tightly. The Carl D. Perkins Act of 2006 had the intention of responding to

the economy, yet considered strongly the accountability of academic and technical standards (Threeton, 2007). Now the increased incorporation of career and technical education into the academic curriculum provides students with greater chances of success on accountability testing, which began with the former No Child Left Behind legislation, and still prepares them for their future jobs (Threeton, 2007).

Industry Certifications

Industry Certifications are credentials that represent the mastery of a specific set of skills in a Career and Technical Education program area. When these were originally developed, they were for trainings, certification programs, and in-service type development. They were also traditionally designed for internal industry use (Aragon, Woo, & Marvel, 2004). Due to this industry-based design, much of the historical information concerning various industry certifications does not include high school age credentialing. Furthermore, the traditional certifications were designed for post-secondary or industry-based testing (Castellano, Stone, & Stringfield, 2005). Castellano, et al. (2009) noted that educators believed that credentials were valuable for high school age students, but there was concern about the use of those at that educational level.

In research performed in Pennsylvania, there was discovered an uncertainty as to the effectiveness of certifications for high school students. Klein and Staklis (2010) found that the attainment of an industry certification during high school was not significantly related to the odds of enrolling in higher education or for subsequent employment. This research was specific to the workplace readiness assessments or

occupation specific testing, and although data on some certifications was limited, they reported a lack of significant relationships (Klein & Staklis, 2010).

A relationship that has seemed to be strong is that between Career and Technical Education and local employers. As evidenced through the Carl D. Perkins Act of 2006, emphasis was placed on accountability and skill assessment. Because of this, Career and Technical Education continued with industry certifications. As noted by Uy and Green (2009), the "stakes were raised" with the priorities reflected in Perkins IV. They commented on the accountability focus of the legislation and how the assessment for certification serves as a signal to industry and higher education of student readiness in the technical standards (Uy & Green, 2009).

Rigor and Relevance

Uy and Green (2009) also commented on the rigor and relevance of Career and Technical Education. As noted by Uy and Green, Career and Technical Education programs were forced, through the Perkins IV legislation, to align rigorous academic and technical standards and also measure achievement of the standards. This focus on rigor and relevance has been re-emphasized with the latest update to Perkins, acting to strengthen the connections between secondary and postsecondary (Advance CTE, 2019).

Fletcher and Tyson (2017) found multiple indicators of the effectiveness of Career and Technical Education with regards to postsecondary opportunities. They discovered that simply participating in various curricular programs was not a predictor for enrollment in Science, Technology, Engineering, Mathematics, and Health

(STEMH) occupations. However, those individuals with a Career and Technical Education high school education were significantly much more likely to enter these occupations in the STEMH pathway (Fletcher & Tyson, 2017). They also uncovered other positive results from secondary Career and Technical Education. In addition to suggesting that Career and Technical Education is valuable in the pathway to STEMH occupations, they also noted that it provides a different option from taking just the highest levels of mathematics and science courses for students. Participation in secondary also is a means to retaining students in the pathway through post-secondary, particularly when considering the participation of minorities in Career and Technical Education (Fletcher & Tyson, 2017). They admitted that long-term advantages are still in question though, as most of the research has focused on short- and medium-term advantages for graduates of Career and Technical Education (Fletcher & Tyson, 2017).

The relevance of industry certifications is undisputed. As many of the industry credentialing assessments were originally designed for internal industry use or post-secondary programs in community colleges, there is belief that there is great value to the awarded certifications (Castellano, Stone, & Stringfield, 2005). Students are able to earn credentials specific to their Career and Technical Education field and demonstrate preparedness for the workforce in a particular area.

The rigor of the certifications is also of benefit for students in secondary Career and Technical Education. According to Lekes et al. (2007), the advantages of the rigors in Career and Technical Education allowed those in vocational education courses to match and out-perform non-Career and Technical Education peers on testing such as

WorkKeys. While they added that a focus still exists on preparing students for college during high school, the skill development and employability offered through Career and Technical Education skills are great (Lekes et al., 2007).

In the information technology field, Bartlett, Horwitz, Ipe, and Liu (2005) investigated the influences of credentials on employee recruitment. They discovered that certifications had a significant difference in the perceived influence on the recruitment process when compared to those without credentials (Bartlett, Horwitz, Ipe, & Liu, 2005). While this perceived influence was particular to the information technology field, the authors discussed the results in terms of the implications for all researchers, educators and Career and Technical Education policy makers (Bartlett et al. 2005). One can correlate the positive effect credentialing has for high school students as they enter the workforce in the credentialled area.

In the spirit of the early design of vocational education, Winthrop, Barton, and McGivney (2018) took the design of skill development to another level with their research performed in India. They suggested that allowing students to have an individual learning rate based on their experiences and skill development, a process they termed 'leapfrogging,' would alter the educational world (Winthrop, Barton, & McGivney, 2018). Their claim was that allowing student development in the area of problem-solving skills was of great educational value. The individual experiences encouraged students to progress based on their own work and abilities and subsequently allowed them to reach their own potential (Winthrop, Barton, & McGivney, 2018).

Some researchers are still apprehensive about Career and Technical Education and the preparation of students. Holzer and Nightingale (2007) mentioned concern over workforce preparedness. The concern by the authors deals with the intellectual development of the students as individuals. There is worry that focusing the individual on a certain Career and Technical Education pathway for purposes of a job, does not provide an education for the broader purposes of learning (Holzer & Nightingale, 2007). This concern appears to be one that is authentic, however it is in contrast to the early design of vocational education, which was geared toward students struggling in regular academia and in need of skill development (Lazerson & Grubb, 1974).

Career Pathways

Career pathways has been a commonplace term in Kentucky over the past few years. Accountability through Perkins funding and the state assessment system both are of concern with respect to having students in a career pathway. Research indicates that this strategy is worthwhile. In the Science, Technology, Engineering and Mathematics (STEM) education, there are multiple pathways that lead to potential jobs. While postsecondary may provide courses that directly influence the education for STEM and high schools offer classes and specialty areas focusing on STEM, Fletcher and Tyson (2017) noted that these offerings tend to ignore Career and Technical Education as a legitimate pathway for the STEM careers. They go on to conclude that students in Career and Technical Education during high school tend to enter those type of occupations more often (Fletcher & Tyson, 2017). Due to this valid, and perhaps

commonplace, pathway with the potential to lead students into STEM careers, Career and Technical Education needs attention from students during high school years.

Lekes et al. (2007) showed that Career and Technical Education course taking does not hinder traditional academic course taking. In fact, they note that performance on some testing indicates Career and Technical Education students do as well and better than non-Career and Technical Education peers. Therefore, enrollment in Career and Technical Education courses during high school should be open to all students, encouraging a truer, perhaps more well-rounded education by providing opportunities not available in regular academia. To have a collection of different classes would address the concern of Holzer and Nightingale (2007) that the intellectual development might be hindered if students are lacking in the scope of a holistic education.

Roles of Career and Technical Education

The role of Career and Technical Education has been everchanging. As previously mentioned, vocational education legislation was originally designed and continually amended to not only help students in their individual education, but also to provide benefit for the local economy (Threeton, 2007). Through education and technical skill preparation, students could become future employees for industry and business. Wright, Washer, Watkins, and Scott (2008) noted that these origins are closely tied to the economic interests and influences. They commented on this as they refer to the power of industrialists. The power of the influence to move higher education and subsequently public education toward what they term the practical arts (Wright, Washer, Watkins, & Scott, 2008). This idea, also supported by Castellano, Stone, and

Stringfield, gives reason to the purpose of industry certifications: purposed for skill standard demonstration and training in industry (Castellano, Stone, & Stringfield, 2005). With this practice in place for business and industry, the training was then passed into education. Although perhaps designed originally for the community college and workforce preparation (Castellano, Stone, & Stringfield, 2005), the certification process also made its way into public education and secondary schools.

School-to-work practices have an increased focus when considering high schools as a preparation ground for the workplace. Rosenbaum (2001), in his book *Beyond College for All*, worked with the idea that not every student should take the path toward college. Education had created a push for all students to go to college after high school graduation. With this, he noted that school counselors would therefore not discourage any student from pursuing that college education – even those with poor performance in high school. While, the college education itself is not a misguided idea, his impression is that the college for all mentality creates a 'forgotten half' (Rosenbaum, 2001).

Rosenbaum (2001) posed a question pertinent to public education and industry: "do employers need youth who are more educated?" (Rosenbaum, 2001). His point is in relation to the history of Career and Technical Education. He brought up the notion that for years, high school graduates have been entering the workforce in many different areas. In fact, the training offered through vocational education allowed many individuals to develop a specific skill set for employment (Rosenbaum, 2001). This skill set was particular to a career pathway and ultimately a working career for those

individuals. Based on the assumption that the skills set developed will be useful in the career pathway of the individual, more education may not be required for some workers.

A next question is then posed by Rosenbaum as well. His work discussed how this practice has occurred for several years and the job market has remained saturated, especially with the number of individuals out of the Baby Boomer generation. This great number of workers is now going to be exiting the job market, creating many jobs for those seeking employment. His question deals with advancements in society and industry. He asked, "will their jobs need replaced? Or has technology changed the way jobs will look?" (Rosenbaum, 2001) His well-timed question brings about the discussion of job types and industry needs. He went on to answer himself by stating it is partially both – a need for some jobs to be replaced yet a need for meeting jobs with different demands (Rosenbaum, 2001). This idea brings to light a discussion of traditional vocational education needs versus the needs of a new industry in society as Career and Technical Education looks to fill the role of preparing individuals for workplace needs and careers.

In addition to having a role in industry and workplace needs, Career and Technical Education has a role in public education. Much of this discussion has been devoted to the need and purpose for students to enroll and earn industry certifications. However, it is also important for high school students to take advantage of the vocational programs during their secondary time in order to supplement their academic education (V, 2017). Stevenson attributed the advantages of vocational education to the

development of problem-solving skills. His book referred to skills that are needed in the workplace and additionally in life; problem solving skills and the ability to be creative in difficult situations. He placed high value on Career and Technical Education as he feels vocational education is a great avenue for this type of teaching and learning (Stevenson, 2003).

Even with the understanding of the role of Career and Technical Education and the importance within industry and society, there exists some resistance to use vocational education to its fullest potential. Part of this may be attributed to perceptions of vocational schools as some believe them to be dumping grounds for students who are struggling or underprivileged (Arum & Shavit, 1995). Arum and Shavit discussed the relationship between vocational schools and college attendance, noting a negative relationship in their research. They do, however, show a positive relationship between vocational education and employment opportunities. This research may substantiate the perceptions that lead to more dumping of students in those schools as they become a safety net. Educators and others may believe as the authors do, that providing the students the opportunity might "reduce the risk of falling to the bottom of the labor queue (Arum & Shavit, 1995, p. 187)." Perceptions such as this, may not elevate the importance of Career and Technical Education and may perpetuate the misnomer that vocational schools can be a catch all for lower level students.

Regulations placed on vocational education and public schools also affect the role of Career and Technical Education. Jacob (2017) noted that Career and Technical Education has been on the decline for several years. The decline is attributed to the

regulations and accountability requirements for high school graduation in the academic core areas according to the author. The author also suggested that the decline could be due to a greater encouragement for students to obtain a four-year degree (Jacob, 2017). With these possible explanations, the role of Career and Technical Education would lessen. This suggested declination of the role of Career and Technical Education is concerning as upper-level Career and Technical Education course work and even simple participation in vocational education and career academies is associated with higher future wages (Jacob, 2017).

Tracking of students

The role of Career and Technical Education in public education and in society seems to be ever changing. Because of the fluid status, multiple strategies have been involved in directing students into or out of vocational education. This type of influence, or perhaps intentional guidance in the case of public schools, can be called tracking. Tracking is not a new concept. It was the very idea of the original federal legislation so as to prepare individuals for future employment. Stone and Aliaga highlighted the benefits in a particular area. Their research, from the End of the 20th Century, found evidence of the positive relationship between participation in Career and Technical Education and critical measures of high school achievement (Stone & Aliaga, 2005). They also noted that most students do not concentrate in Career and Technical Education, however. With a greater academic focus beginning at the time of their research, they also expressed concern over the future of Career and Technical Education and tracking students in a pathway (Stone & Aliaga, 2005). Their research indicates a

positive correlation, but with more emphasis on academic courses they question how Career and Technical Education coursework might be affected. They fear there will be less room in the high school schedule for Career and Technical Education courses, which might lead to a negative effect on student achievement (Stone & Aliaga, 2005).

Tracking also exists in the core academic courses. With the push for college-for-all, as described by Rosenbaum, counselors may track students into the pre-college curriculum, even though their performance may not indicate a readiness for it (Rosenbaum, 2001). This level of tracking would be detrimental to Career and Technical Education as students with vocational education interests and the need for skill development might miss out on opportunities. Tracking in this example, is not in itself a poor idea, but without proper guidance could lead to poor results for students.

Research by other groups demonstrate that tracking might have a negative effect on individuals. Meer suggested that there is little or no evidence of the economic benefit of vocational education at the secondary level (Meer, 2007). He noted that those students on a technical track are not likely to earn more than if they had chosen a different track in high school, as often methods allow for self-selection in track choice (Meer, 2007). This idea, however, may be influenced greatly by local demographics. If individuals are tracked based on interest and skill potential rather than socioeconomic status or local demographics, perhaps tracking could provide opportunities that peak student achievement.

Ineffective tracking could lead to a negative view of the academic pathway. Perceptions from a variety of individuals are responsible for the negative effect (Nagle,

2001). The work by Nagle is a collection of stories of vocational education students from varied backgrounds and creates the sense that there are certain types of coursework for certain types of people. Tracking, or pathways, that are designed to lead solely to factory workers created a separation of the class of individuals involved in the pathway. The author made a statement, reflective of stories collected through interviews, that "through instruction and social relationships in school, school participants learn their place in the world as well as the lessons that are being taught (Nagle, 2001, p. 9)."

Much of the debate and uncertainty over tracking can be summarized in an article by Wyman. Wyman studied the practice of tracking students, researching as far back as the 1950s. He noted that up until that time, students were taught, in addition to reading, writing, and arithmetic, vocational and job-ready type skills (Wyman, 2015). However, during that decade a new philosophy began to emerge. One that grouped students according to their ability levels – tracking. Some students were bound for college and would focus on the traditional academic courses without any vocational training. Other students, not bound for college, would take basic academic courses along with vocational training (Wyman, 2015). Although tracking might have been the new philosophy in education, parents quickly disagreed with the concept. They claimed that students were assigned tracks more by socio-economic status than by ability and aptitude. Therefore, what was earlier accepted as a full education, now was viewed as a way to separate and segregate students, particularly the minorities and working-class families (Wyman, 2015). The author went on to comment that the uproar did not

eliminate tracking and place vocational education on equal ground with regular academia, but rather created a focus where college-for-all was the new philosophy; a philosophy that still drives the curriculum of the secondary schools in the Nation (Wyman, 2015).

Importance of Career and Technical Certifications for Individuals

A general purpose of education could be described as the practice of preparing individuals for their future. With this outlook, the courses and pathway taken by students would ultimately be used to guide their training in preparation for a career. This opportunity is provided through Career and Technical Education.

Career Choices

The origins of Career and Technical Education are closely related to the needs of society. Economic influences and interests were a driving force in the birth and development of vocational education (Wright, Washer, Watkins, & Scott, 2008). These influences and interests were due to the power of Industrialists as they influenced higher education for the benefit of workforce training, which in turn aided in the movement of public education toward the practical arts (Wright, Washer, Watkins, & Scott, 2008).

The movement of public education toward the practical arts and opportunities through vocational education established a pattern of labor preparation. While those individuals bound for college would enroll in the core academic courses, others enrolled in Career and Technical Education courses for dissimilar reasons. Some would take Career and Technical Education courses to supplement their academic background. Some would enroll in Career and Technical Education based on interest and skill. A few

might have been forced to enroll. This collection of reasons, in addition to others, probably led to the perception described by Wright, Washer, Watkins, and Scott (2008) that career and technical education may be perceived less as a college preparatory subject and more of program pathway. The authors noted that employers represented in their study shared this perspective (Wright, Washer, Watkins, & Scott, 2008). Still today, common language in Career and Technical Education represents the idea of a career pathway model as opposed to a college preparatory model.

The career pathway language is further reinforced through suggestions made by other studies. Comments by Meeder (2008) are made in relation to how Career and Technical Education might prepare students for college and career, but seemed to focus on the career aspect. The author suggested that Career and Technical Education courses could supply the need for basic soft skills which are needed for employment in the 21st century (Meeder, 2008). These same comments were previously made by Castellano, Stringfield, and Stone (2003) in earlier research.

Although some perception exists that Career and Technical Education is an alternate pathway, there is also an embracing of the education. Hull discussed ways high schools can improve their overall academics. He mentioned the need in society for high level skills in order to meet labor market demands. He suggested that academia should build on what has been learned through Career and Technical Education and the technical preparedness of students (Hull, 2005).

A perception and trajectory that should be avoided in Career and Technical Education is the fallacy that it is only for those that are unable to attend college. As

demonstrated in *Voices from the Margins*, there can be a perception that students taking vocational education courses will develop an idea that their place in the world is determined by their courses in high school (Nagle, 2001). This misconception may occur through misguidance, poor vision, or unhealthy advising relationships in secondary schools.

V (2017) suggested that healthier perception of Career and Technical Education promotes the career pathway model. V suggested that for some, attending a technical school is a means toward an industry certification and perhaps employment. For others it is an opportunity to supplement their academic education (V, 2017).

Time of Certifications

Vocational education and the earning of industry certifications create pathways for students to employment and potential careers. As early legislation demonstrated, a focus was placed on preparing individuals for work in industry and to benefit the economy. Much debate, however, has taken place on the benefits and timing of when credentialing should occur for students.

In a study performed by Tamar-Belgraves (2016), there was inquiry into whether industry certifications are more valuable when earned during post-secondary education versus secondary. It notes that an argument exists for credentialing during post-secondary as those students have a greater foundational knowledge. They have an increased marketability and more advantages in securing a long-term career.

Age appropriateness is also a discussion when comparing secondary and post-secondary. Tamar-Belgraves (2016) suggested in her study that secondary students

should be offered introductory concepts and skills suitable for high school. This introduction of introductory concepts and skills would begin the foundation on which post-secondary may build and the advantages discussed in the study would begin to surface.

The foundational education for certification readiness was also addressed by Randall and Zirkle. They suggested that high school graduates lack the strong theoretical foundation. Those students simply do not have the previous experiences to draw from, particularly when faced with new concepts (Randall & Zirkle, 2005). They discussed how the impact of the information technology certification on student success depends greatly on the educational level of the student when the credential is earned. They argued that the long-term career prospects are limited for high school graduates. They noted post-secondary students not only have the stronger background, but through increased marketability have a better chance for long term success (Randall & Zirkle, 2005).

Although there seems to be mixed reactions to offering industry certifications to secondary students, there remains evidence that vocational education during high school is beneficial for the student. The skill and the employability development through Career and Technical Education are advantageous. Lekes et al. (2007) found that Career and Technical Education transition programs do not hinder academic course taking and actually show on some testing the Career and Technical Education students out performed their non-Career and Technical Education peers. Bragg and Ruud (2007) found that although predicting feelings on behaviors is difficult, there is reporting that

Career and Technical Education transition students felt better prepared for college and careers in vocational education programs.

Dougherty (2015) found that there are earnings benefits for secondary exposure to Career and Technical Education. The focus of the study was in Massachusetts and looked at how participation in Career and Technical Education affected personal capital for those individuals. While the study did not show if effects differed under the high-stakes accountability model, it demonstrated the effects on graduation. The study showed on-time graduation is increased by Career and Technical Education participation. The increase is three to five percentage points for higher income students and seven percentage points for lower income students (Dougherty, 2015). This report demonstrated benefits of Career and Technical Education in secondary schools as debates may continue to occur with respect to the effectiveness and timing of the credential process.

Labor Market

The relationship between the labor market and Career and Technical Education is a unique one. The needs of the labor market can help determine which types of vocational and technical offerings should be available for students while in secondary or post-secondary education. When Career and Technical Education has done its job well, the labor market has potential employees that possess the required skills. The alignment between the two, however, may not be so simple, particularly when considering secondary.

In an analysis by Fletcher and Tyson (2017), there exists different outcomes when considering the labor market. They submitted that research demonstrates short- and medium-term advantages for Career and Technical Education graduates. However, they suggest long-term workforce outcomes are not well known with respect to the differentiated schooling experiences such as Career and Technical Education (Fletcher & Tyson, 2017). While graduates may be likely to gain employment soon after completing their schooling, the research analyzed by Fletcher and Tyson is minimal in determining the career influences of Career and Technical Education.

A major positive for the labor market with respect to Career and Technical Education is the credentialing of individuals. Bartlett (2012) advocated for the high importance of industry certifications. He suggested that the labor market, as well as potential employees, are constantly trying to determine the best way to identify individuals with the proper skills and the abilities to fulfill a position. Certifications or credentials are a signal for both employers and employees. He noted that potential employees are able to provide evidence of skill level with the possession of their credential. Employers are able to determine which individuals already possess desired skills and abilities based on certifications (Bartlett, 2012).

Bartlett, Horwitz, Ipe, and Liu (2005) suggested the relevance of certificates with regard to recruiting. They suggested a significant difference is found on the influence of credentials when comparing the recruitment of potential information technology employees with credentials to those without (Bartlett, Horwitz, Ipe, & Liu, 2005). This type of information, they proposed, is extremely beneficial for educators

and policy makers, in addition to researchers and employers. As Meeder and Castellano, Stringfield, and Stone pointed out, Career and Technical Education can also supply the basic soft skills which are needed for employment (Castellano, Stringfield, & Stone, 2003; Meeder, 2008).

Some are not convinced of the positive labor market outcomes associated with Career and Technical Education. Crouch, Finegold, and Sako (1999) explored the relationship between education or training and employment. The authors commented on the importance of training that occurs in the vocational fields with respect to the workforce, but then addressed a larger issue of concern. They questioned the relationship between education and the economy. They proposed that if education is relied upon to supply skills which some hope to, in turn, use to solve economic or social problems, there is possibly a problem bigger than employment. Their suggestion is this issue leads to larger gaps in society. As federal, state, or local government becomes restricted to caring for the unemployed and acting to create policies for training opportunities, the levels of work production may decrease. They also suggested there would be lower levels of entitlement of the displaced workers. These concerns would then lead to a larger gap between the skilled labor and managerial positions, resulting in bigger salary differences. This cycle would exacerbate the problem. Finally, they posed the question, “can vocational education and training help solve the problem of mass unemployment (Crouch, Finegold, & Sako, 1999)?”

The book by Rosenbaum, while commenting on both positives and negatives, brought about a perspective on the need for high school Career and Technical Education

in relation to the workforce. It questions if employers really need more educated youth. If the answer to this is yes, it goes on to question if high school is the effective time to prepare them for job readiness (Rosenbaum, 2001). As technology and jobs have changed, the workforce needs have changed. This idea has Rosenbaum suggesting that society is reaching a crossroads with respect to the handling of the education-job market relationship.

Kincheloe (1999) brought to light another aspect of the job market in practical business sense. He made the point that business is still business, and there are often the cut-throat happenings that occur based on the bottom dollar (Kincheloe, 1999). He noted that businesses may hire employees as part-time only or may not provide benefits for employees. Businesses may not be concerned with the employee's well-being, but rather the mighty dollar. Considering this, he questioned whether vocational education is effective in today's economy (Kincheloe, 1999). Although, this publication was at the turn of the century, the idea that businesses are interested in profits is still true. Perhaps it provides the realization that business drives its own needs for training, despite regulations that may be in place for educational institutions.

Long-term Earnings

An important component to business and industry, and especially the individual employee, is long-term earnings. The desire is that workers are able to find a job and career that fits them personally, but in reality, the financial portion typically plays a role in the decisions of individuals. The research found concerning this demonstrated

differing viewpoints, but largely positive relationships were discovered in readings on the connection between Career and Technical Education and earnings.

The first work focused on secondary vocational education and tended to find little financial benefit. Meer's (2007) methods indicated for those students who self-selected in their career track choice, those choosing the technical track were not likely to earn more than if they had chosen differently. He suggested that differences may be due to natural demographics of these students. Meer also provided examples showing secondary Career and Technical Education does not lead to higher earnings or economic benefit.

Fletcher and Zirkle (2009) made an analysis dealing with the National Longitudinal Survey of Youth 1997 dataset. The purpose of that study was to link participation in secondary tracks to degree attainment and occupational earnings. They suggested that the findings indicated the Carl D. Perkins Vocational and Applied Technology Education Act of 1990 may not be meeting its objectives in terms of postsecondary degrees earned by Career and Technical Education students (Fletcher & Zirkle, 2009). However, in terms of occupation earnings, they found that Career and Technical Education students were outperforming the general, dual, and college preparatory tracks. They found a significant relationship between secondary tracking and earnings, noting that students from the Career and Technical Education track were expected to have higher earnings than peers (Fletcher & Zirkle, 2009). They cite average incomes from 2006, which were based on earnings nine to ten years after

secondary graduation, and give evidence showing Career and Technical Education track individuals earned the highest average salary (Fletcher & Zirkle, 2009).

Kemple (2008), in his study in career academies, suggested earnings impacts were concentrated among young men. He provided data showing the earnings gains from Career Academy graduates was eleven percent more per year than for non-Academy individuals. He noted that particular group had experienced a decline in earnings, making these data a positive in terms of labor outcomes.

Anthony, Hanson, and Fasules (2018) published a work that takes the idea of Career and Technical Education coursework and earnings to a different level. They noted how regulations and requirements continually change in academia. Because of this constant changing of regulations and requirements, sometimes students take courses, even vocational courses, without being prepared for any type of employment. They provided data, however, that demonstrates those students who take the required number of courses to be considered a concentrator by Carl D. Perkins regulations, earn ninety cents more per dollar than those who don't reach the same coursework level (Carnevale, Hanson, & Fasules, 2018). They suggested that requirement and regulations have forced some students out of Career and Technical Education courses and into regular academic courses, leading to secondary training that is no longer job specific. They went on to discuss how the reauthorization of the Perkins Act is a step in the right direction as it creates a push for career readiness (Carnevale, Hanson, & Fasules, 2018).

A declination of Career and Technical Education has been attributed to the increase in regulations and requirements for the past several years (Jacob, 2017). Jacob

suggested the encouragement for students to obtain a four-year degree through a college or university has been a contributing factor in the decline. He indicated this increased encouragement for four-year degrees is a strongly correlated reason for the waning of Career and Technical Education. The lack of progress is troubling to the author as he noted upper-level vocational courses and even simple participation in vocational or Career Academies increases future wages for an individual (Jacob, 2017).

Organizational Responses with respect to Career and Technical Education in Kentucky

At all levels of education, there are characteristics that prepare students for various phases of their career, both in education and the workforce. At the primary, secondary, postsecondary, and labor force levels there is sequence of learning that occurs, preparing the individual for a career. Particularly in secondary and postsecondary, there is an emphasis on transitioning into the workforce and because of this, great importance is placed on the training and education that takes place. Each level plays its own role, but with Career and Technical Education there needs to be a connectedness between secondary, postsecondary, and the workplace.

Secondary versus post-Secondary

According to Stubbs and Stubbs (2017), secondary schools with high performing Career and Technical Education programs in Kentucky have great importance in student preparation. Students graduating from those high performing schools are prepared to enter the skilled workforce or college (Stubbs & Stubbs, 2017). Part of this is attributed to the influence of a drive for increased accountability, but it is

noted that Career and Technical Education programs regularly collaborate with advisory boards in order to enhance the pathways as a factor as well (Stubbs & Stubbs, 2017).

Secondary schools do not always receive high praise from higher education and industry, however. As reported by Hart (2005), only 61 percent of high school graduates were prepared for entry-level work and less than half were prepared for jobs beyond entry-level (Hart, 2005). Of those attending postsecondary institutions, less than half of the students reported they were prepared for college and less than one-fifth of the college instructors reported that their students were very well prepared (Hart, 2005). With respect to Career and Technical Education in secondary, though, there have been more optimistic reports, such as that by Bragg and Ruud (2007). They suggested it is a positive result that Career and Technical Education transition program students reported higher levels of preparation for college and careers (Bragg & Ruud, 2007).

Part of the argument on industry certification effectiveness is based on when students earn the certification. Randall and Zirkle (2005) argued that postsecondary students have a stronger foundation upon which to build and have better chances for long-term career success. Specifically, with information technology, they suggested that a certification earned by a high school student will have a limited impact for the individual (Randall & Zirkle, 2005). They attributed this not only to the foundational background, but also from experiences, particularly when faced with new and changing technologies (Randall & Zirkle, 2005).

Some proponents of offering potential certifications to high school students suggest the certifications should be more introductory in type and provide skills suitable

for secondary students (Tamar-Belgraves, 2016). Also, according to Tamar-Belgraves, critics argue that industry credentials earned during postsecondary education offers more advantages to students (Tamar-Belgraves, 2016). This sentiment seems to be prevalent in the research performed.

College and Career Readiness

With research demonstrating effectiveness of industry certifications at different levels of Career and Technical Education and a general push for students to be more transition ready, there is a greater emphasis on accountability and preparing students for college and careers. Rothman (2012) suggested that common core standards were explicitly designed around the goal of ensuring college and career readiness for students. A portion of the standards are designed for technical or vocational education and, in particular with Kentucky schools, can have great impact on their accountability ratings.

Stubbs and Stubbs (2017) noted that high schools in Kentucky which have high performing Career and Technical Education programs have a definite influence on the accountability scores. A portion of this high performance can be credited to the collaboration between Career and Technical Education teachers and the local advisory boards. The communication and ability to adapt to changing needs helps Career and Technical Education programs prepare students for college or the workforce. Their study analyzed strengths of high performing Career and Technical Education programs which could be shared and utilized to impact procedures in other schools and aid in increasing the college and career readiness indicators (Stubbs & Stubbs, 2017). Part of

their findings suggest planning and scheduling of secondary classes is a major obstacle. The predetermination of course sequences and entrance into pathways, as done in Career and Technical Education, would be beneficial for improving the overall college and career readiness of students.

The benefits of Career and Technical Education have been demonstrated in other states as well. In a Massachusetts study by Daugherty (2015), Career and Technical Education participation was shown to have a positive effect on graduation. According to the study, higher income students increased on-time graduation by three to five percentage points, while the increase for lower income students was seven percentage points (Dougherty, 2015). This type of benefit promotes Career and Technical Education as a meaningful and valuable opportunity for students.

Accountability changes seem to occur regularly, but the latest Kentucky accountability changes underscore a more well-rounded approach for students. With students as the focus, the emphasis on individuals being transition ready and prepared with knowledge and skills specific to their pathway signifies a redesign based on much feedback (Sims, 2018). This emphasis also allows further opportunities in career and technical education for students as academic and school measures include multiple factors, not simply academic indicators.

According to Whitaker from the Kentucky Department of Education, the changes in the accountability model "spotlight Career and Technical Education as a viable means to a high school diploma and preparation for postsecondary training and career" (Whitaker, 2019, p. 1). The Career and Technical Education content, in addition

to the academic foundation, provide opportunities for students. The changes in the accountability system are reflective of the Commonwealth's strategy to improve the state economy and workforce development. Students are provided meaningful chances to "engage in pathways that build awareness of career opportunities, provide real-world instruction and lead to credentials with labor market value" (Whitaker, 2019, p. 1).

The effort of promoting college and career readiness is echoed in a book thusly titled by Sambolt and Blumenthal (2013). They noted that states have already begun the process of expanding previously siloed departments in order for collaboration to occur through secondary, postsecondary, and the workforce. They suggested that failure to develop more college and career readiness would be detrimental to the nation as it impacts the success of individuals and the United States as a whole, and subsequently the country's global competitiveness (Sambolt & Blumenthal, 2013).

Industry Certifications

Through the exploration of an exhaustive list of sources, research shows there are a variety of responses to the effectiveness of industry certifications based on level of education. Some research tends to suggest post-secondary credentialing is the most beneficial time for individuals while others suggest that secondary can be extremely effective. There are even authors who feel industry should be the place for the certification process. Although consensus does not exist on the level of education that most benefits the credentialing process, there seems to be an understanding of the importance of industry certifications. As noted earlier, the certificate itself can be a

signal to industry and to the potential employee that the individual's skill level meets expectations for the specific area (Bartlett, 2012).

Specifically, in Kentucky, there exists a definitive process for recognizing pertinent industry certifications. According to Whitaker, the Kentucky Department of Education works to ensure the practicality and relevance of industry-recognized credentials as well as the alignment to career pathways (Whitaker, 2019). Although the list of available industry certification for Kentucky secondary students is approaching four hundred, each of them have been selected specifically to meet needs of the Commonwealth. According to Whitaker:

The valid industry certification list is based on information provided by local workforce investment boards (WIBs), reviewed by multiple business and industry groups, presented to the Kentucky Workforce Innovation Board (KWIB) Business and Education Alignment Committee and approved by the KWIB. (Whitaker, 2019)

This level of involvement along with the redesigned accountability provides opportunity for students and gives them career pathway options at their disposal.

This level of detail then must translate into opportunities for individuals. According to Klein and Staklis (2010), the industry certifications given to high school students had not related to subsequent employment or postsecondary enrollment. Most specifically, their data showed no significant relationship between credentials and enrolling in higher education.

The study previously mentioned by Tamar-Belgraves, also suggested secondary certifications are less relevant. She expressed that credentials during secondary must be

appropriate for the age group and introductory in concept. Her study went further and noted that postsecondary students simply have more advantages based on their greater academic foundation and marketability (Tamar-Belgraves, 2016).

Industry credentialing is important to workers. These credentials can sometimes be earned in secondary or postsecondary courses. Whether the changes in the accountability system will signify constructive changes for industry certifications in Kentucky is yet to be seen and an intention of this study.

Perkins

Federal legislation enacted over one hundred years ago and subsequent legislation and amendments, have purposed to strengthen vocational education. Most recently, the Carl D. Perkins Career and Technical Education improvement Act of 2006 and the amendment in 2018 aim to focus responsiveness to the economy and tighten up the accountability for academic and technical education (Threeton, 2007).

The reauthorization of the Carl D. Perkins Act in 2018, commonly known as Perkins V, is specifically designed to prepare Career and Technical Education for the 21st Century. According to a report by Granovskiy (2018), under Perkins V, states may reserve up to 15% of allocations for Career and Technical Education programs in rural areas or areas with high numbers of students in Career and Technical Education or for Career and Technical Education programs which are innovative. This allowance is up 5% from that which was permissible under the previous Perkins IV regulations (Granovskiy, 2018).

Also, in the report by Granovskiy, there are requirements for needs assessment by local Career and Technical Education providers. This needs assessment is designed to create better alignment between the programs of study being offered in local Career and Technical Education with the labor market needs and in demand jobs (Granovskiy, 2018). This requirement, while perhaps not matched exactly by the Commonwealth of Kentucky prior to the reauthorization, is the direction demonstrated through the actions of The Kentucky Department of Education and its partners.

The partnership between the Commonwealth and the Kentucky Workforce Innovation Board confirms the existence of a relationship based on economic and local business needs. The findings from the partnership then allows the Department of Education to support and guide secondary schools in their Career and Technical Education efforts. While Perkins V is pushing all Career and Technical Education toward this, Kentucky already established the strategy to grow and improve workforce development (Whitaker, 2019).

Industry Needs

As legislated by the reauthorization of the Carl D. Perkins act, the needs of local business and industry are assessed and used to inform decisions by the Department of Education and local Career and Technical Education institutions. This emphasis is attributed to the gap that exists between what education curricula offer and the industry skills needed. The gap exists due to the quickly and ever-changing needs of industry world-wide. The adaptations by higher education have not been fast enough to keep up with demands, ensuring the gap has continued. In response to this, the United States

was the first to develop the competency-based education to combat the issues (Abdelaziz & Gasmi, 2018).

In Kentucky, evidence of addressing gap issues can be found through efforts of the Office of Career and Technical Education and Student Transition. Currently, all approved Career and Technical Education pathways are related to the top 120 occupations in Kentucky. Each of the pathways are also pathways which can lead to a high-wage career (Office of Career and Technical Education and Student Transition, 2019). This kind of effort acts to increase the value of Career and Technical Education in the Commonwealth. Further analysis shows students who complete Career and Technical Education program pathways achieve high wages after graduation from high school. It also shows Career and Technical Education pathway completers enroll in postsecondary institutions at rates only exceeded by students classified as exceptional (Office of Career and Technical Education and Student Transition, 2019). This return on investment is important for the advancement of Career and Technical Education and the positive relationship with industry.

Apprenticeships (TRACK)

Another student-centered route available in Kentucky is the Tech Ready Apprentices for Careers in Kentucky (TRACK) program. The TRACK program is a youth pre-apprenticeship program that exists due to the partnership between the Kentucky Department of Education's Office of Career and Technical Education and the Kentucky Labor Cabinet. The program is a Career pathway for secondary students

which offers opportunities leading into Registered Apprenticeship programs (Taylor, 2019).

According to Taylor, TRACK is a program driven by business and industry. It creates a pipeline for students to enter post-secondary training and apprenticeships. Since the program includes educational components determined by business and industry, employers are able to tailor the program for their specific needs, including the individual selection of Career and Technical Education secondary courses. The program is intentional in the effort to establish a good foundation for students with an interest in a particular occupation and allow employers to prepare future employees for their industry specific job. In addition to the benefits afforded the student, it allows them to receive a nationally recognized credential at little or no cost (Taylor, 2019).

Conclusion

This chapter has provided an extensive review of literature relating to the research topic. An exhaustive effort was made in finding relevant literature on Career and Technical Education and how it translates into employment for graduating students. Much of the literature focused on other areas and highlighted the benefits of Career and Technical Education with regards to salaries and income as well as post-secondary benefits. The organization changes that have been made and the legislative mandates have helped direct Career and Technical Education to its current state. Current policies and procedures are encouraging more involvement in Career and Technical Education and further partnerships for secondary schools, stakeholders, and business and industry.

Employment seems consistently to be a topic of conversation in society. It often is a debate topic in the political realm and through personal experiences and has certainly been found to be the focus of many conversations with local business and industry. In these personal conversations, a consistent topic includes working skills; both job specific and interpersonal related. A career and technical type school has the potential to provide skill development in both areas. Some researches, such as Castellano et al. (2003) and Meeder (2008) suggested something employers may desire to hear about Career and Technical Education: Technical type courses help increase the soft skills for students, those skills necessary for successful employment (Castellano M. S., 2003; Meeder, 2008). This study will look to investigate the technical aspect through the job specific skill correlation. Subsequently, the focus of this study is in determining the relationship between credentials earned during high school and ensuing employment. This correlation will be beneficial in the area of technical education, as research has produced a lack of information about the credential-employment relationship. Castellano, Stone, and Stringfield (2005) bring to the forefront concerns with the age appropriateness where teachers question if high school is too early for these certifications. They discussed the belief that earning the certifications is a valuable asset for students, but express concern with the preparedness for this situation in their young lives (Castellano, Stone, & Stringfield, 2005).

Klein and Staklis (2010), in a study performed on Pennsylvania secondary students, found the lack of a relationship between industry certifications earned in high school leading to employment, and especially in certifications leading to enrollment in

higher education. However, career and technical education continues to make technical education and certifications a point of emphasis as it understands the benefits for those students ready to enter the workforce (Uy & Green, 2009). Uy and Green cited the enactment of the Carl D. Perkins Career and Technical Education Act in 2006 as evidence that accountability is placed on career and technical educators to increase achievement and to indicate the readiness of students entering the workforce (Uy & Green, 2009).

Chapter 3: Methodology

Introduction

The purpose of this study was to explore the bivariate correlation between industry certifications earned by graduating high school seniors to the employment of those graduates in the same area as their certification pathway. Chapter 3 will include the research methodology and design used to gather data and determine results, as well as the potential limitations of the study.

Research Questions

These research questions were designed to guide the data collection for this specific study. The years to be studied were specifically chosen attributable to a change in the Carl D. Perkins Act. Due to the timing of the change, the study worked to encompass school years just prior to the update in legislation and focused on years that schools were all performing under the Carl D. Perkins Act of 2006. The intention was to increase the reliability of data instead of collecting data under different legislative rules. Beginning in 2019 there was an update to the Federal Act and although not part of this study, the attention given and the changes made to the Act are designed to further strengthen accountability and the pathway from secondary to postsecondary and/or work (Advance CTE, 2019).

1. Is there a significant difference in the number of industry certifications earned from graduating students in the Cumberlands Region of Kentucky between the school years 2013-2014 and 2017-2018?

2. Is there a significant difference in the number of students gaining employment in their credentialed area between the school years 2013-2014 and 2017-2018 in the Cumberlands Region of Kentucky?
3. What is the correlation between number of industry certifications earned and the number of students gaining employment in their credentialed area between the school years 2013-2014 and 2017-2018?

The findings of this research intended to offer supplementary information regarding the value of available industry certifications for secondary age students with regard to finding employment post-graduation.

Research Design

With the purpose of determining the type of correlation between secondary industry certifications and employment post-graduation, the research questions were quantitative in nature. The collection of the raw numbers for the independent and dependent variables allowed this study to perform paired sample t-tests and descriptive statistics. Data was disaggregated by high-demand sector and by school. The data was entered into SPSS and analysis was performed to determine the bivariate correlation between earned industry certifications and post-graduation employment.

Setting

This study was conducted on the Cumberlands Region of Kentucky. The Cumberlands Region had been identified by the Kentucky Center for Statistics as a Regional Workforce Area and included the following Kentucky counties: Adair, Casey, Clinton, Cumberland, Green, Laurel, McCreary, Pulaski, Rockcastle, Russell, Taylor,

Wayne, and Whitley (KY Center for Statistics, 2019). The counties included in the Cumberlands Region contained similar demographics and were recognized as rural. The Kentucky Center for Statistics listed five criteria in the determination of a work-ready community: internet availability and speed, high school graduation rate, some college or higher degree, associate degree or higher, and working age population (18-64 years) without a high school diploma (KY Center for Statistics, 2019). The Dashboard illustrated two of the thirteen counties met four out of the five criteria for Work Ready Communities; four of the thirteen counties met three of five criteria; and seven of the thirteen counties met two of five criteria (KY Center for Statistics, 2019). Of the counties included in the Workforce Area, seven included Commonwealth of Kentucky operated Area Technology Centers and two more included other technology centers that aided in the promotion and education of students in Career and Technical Education.

Target Population

This study was conducted on the Cumberlands Region of Kentucky using data from public high schools. It utilized data signifying the number of seniors that earned industry certifications while in high school and the number of graduating seniors who earned employment in the same pathway area as their career and technical credential. Students nor schools were identified with their data through the data analysis.

Data Collection

Data was collected using the Kentucky Center for Statistics website, by means of the Dashboard to navigate through the necessary charts and diagrams, in addition to the Technical Education Database System (TEDS) and the Kentucky School Report

Cards made public by the Department of Education. Data was disaggregated according to school, yet precautions were taken to avoid direct labeling of schools with their respective data. A code system was utilized for the schools in the analysis of this study. Data collection focused first on the number of industry certifications earned by seniors for each of the school years 2013-2014 and 2017-2018. Then, the number of graduating seniors earning employment in their specific program pathway was collected. The analysis was then performed on the Cumberlands Region as a whole.

Instruments to be Used

As previously mentioned, more than one source was utilized to retrieve the data. The Kentucky Center for Statistics website contained information as reported by the Kentucky Department of Education. The Kentucky Department of Education employed the TEDS system in collecting data as well as other reports for the assortment of data on Career and Technical Education.

Once collected, the data was organized into a spreadsheet where special care was taken to keep confidentiality of data and the 13 counties selected. Although identifiers such as socioeconomic status and disability were accessible in the data through the Commonwealth of Kentucky reporting, those factors were not utilized in the determination of the correlation of variables in this study. Since those identifiers are attached to the collected data, however, they were discussed as potential supporters or barriers to the relationship during the analysis portion of this study.

Correlational Analysis

Once all data was collected, it was input into the Statistical Package for the Social Sciences (SPSS) software program. Utilizing this program, paired sample t-tests and bivariate correlational analysis was performed on the data and results were displayed using tables and charts or graphs. Of the data collected, industry certifications earned by high school students was the independent variable. The number of students gaining employment in the credentialed program pathway was the dependent variable. The regression analysis performed allowed observance of the significance of the correlation between the variables and determination of whether the significance was positive, negative, or lacking.

Limitations

Potential obstacles existed in this study. While there were a large number of graduating seniors from the thirteen-county area represented in this study, the correct and full reporting of data was dependent upon the institutions in those counties. Each school or district was responsible for reporting its own data in TEDS. Accurate reporting by schools or districts was critical to these data. A limitation might have been if schools did a poor job of follow up with graduated students in determining their work status post-graduation. Although expected to be much less likely, incorrect or incomplete reporting of industry certifications during high school would also skew the data.

There was a limitation of the study that existed concerning post-graduation pathways of students. While some students transitioned directly into the workforce – the

data desired for this study – there were some students that furthered their education prior to entering the workforce. Students may have elected to enroll in a post-secondary institution to receive further training or degrees prior to entering the workforce. Even though their pathway may have been a continuation of the secondary credentialed sector, the data for this transition was available at the post-secondary level and would not be analyzed in this study.

Another limitation that might have existed is the availability of the disaggregated data. While the Kentucky Department of Education released data yearly, the reports to be utilized through the Kentucky Center for Statistics could have only showed data for the region or county, instead of according to high school or technical school. This phenomenon was not detrimental to the determination of the correlation, but may have prevented an in-depth analysis for possible causes and patterns leading to the relationship.

Ethical Considerations

The data to be utilized for this study was accessible through the web via the previously mentioned reporting sites. The researcher for this data collection attained institutional Review Board (IRB) approval. Since the study was quantitative in nature and data was obtained through the Kentucky Department of Education, the Kentucky Center for Statistics, and TEDS, there was no need for consent agreements or surveys. The researcher did utilize a code system, which was kept private and protected, to preserve anonymity of the schools and counties selected for this study.

Summary

Chapter 3 provided an overview of the methods and procedures that were utilized in this study. This particular study was unique to the Cumberlands Region of Kentucky, but generalizations might have been made for other Regions with similar demographics. This study could have been performed on any Region of Kentucky to determine the relationship of industry certifications in high school to post-graduation employment. Much other information about workforce, wages, and readiness, while not pertinent for this study, was available for all Regions of Kentucky through the Dashboard on the Kentucky Center for Statistics website to be used (KY Center for Statistics, 2019).

Chapter 4: Data Analysis

Purpose of the Study

The purpose of this study was to research the bivariate correlation between industry certifications earned by secondary students in the Cumberlands Workforce Area of Kentucky with the employment of those individuals in their credentialed pathway area after graduation from high school. The inclusion of industry credentialing in multiple pathways through career and technical education may offer greater exposure and access to employment opportunities available to students in Kentucky post-graduation. Various authors (Arum & Shavit, 1995) have applauded the importance of career and technical education in student preparation for the workforce and the advantages afforded to vocationally trained students when entering the workforce, while another author (Rosenbaum, 2001) was less confident, declaring a disconnect between education and the business world.

Demographics of Kentucky Students

Kentucky is comprised of 120 counties, many of which hold multiple school districts for a total of 171 school districts in the Commonwealth. During the 2017-2018 school year, there were 656,394 students in the more than 1200 schools (Office of Education Accountability, 2019). During that year, 29% of the student population were in grades nine through twelve and the graduation rate was 90%, which was an increase of one percentage point from the previous year, continuing the upward trend in graduation rate (Office of Education Accountability, 2019). The demographics in

Kentucky were not reflective of the demographics in the United States as Kentucky reported a much lower percentage of non-white students. In Kentucky, white (Non-Hispanic) students encompassed 78% of the population, with only around 22% of the population made up of other ethnic groups (Office of Education Accountability, 2019). In the United States, non-white ethnic groups comprised nearly half of the student-age population at 49%, with the white (non-Hispanic) population at 51% (De Brey, et. al. 2019).

Table 1. Student Population Percentages

Ethnic/Racial Group	United States	Kentucky
White (Non-Hispanic)	51%	78%
Black	14%	10%
Hispanic	25%	6%
Other	10%	5%

Source: (De Brey, et. al. 2019)

Educational Attainment

Graduation from secondary schools, among other benefits, could provide opportunities for students to continue their education or earn employment. The changes in accountability seemed to be designed to help encourage the attainment of graduation, and consequently possible employment, for students not pursuing additional education with the offered courses for earning industry certifications during high school. Tracking of the graduation rates was done by the Commonwealth and during the time studied

there was an overall increase in graduation rates. From the 2013-2014 school year to the 2016-2017 school year (year data was available), the graduation rate increased from 88.0 to 89.7 for the entire state of Kentucky. The 89.7 graduation rate from 2016-2017 was higher than the national average of 84.6 during the same school year (Gewertz, 2019).

The graduation rate of the schools in the Cumberlands Local Workforce Area improved for all except four schools, which were still above the state average. This increase, while not researched for this study, may have been due to the changes in accountability and possibly connected to the increased focus on credential attainment.

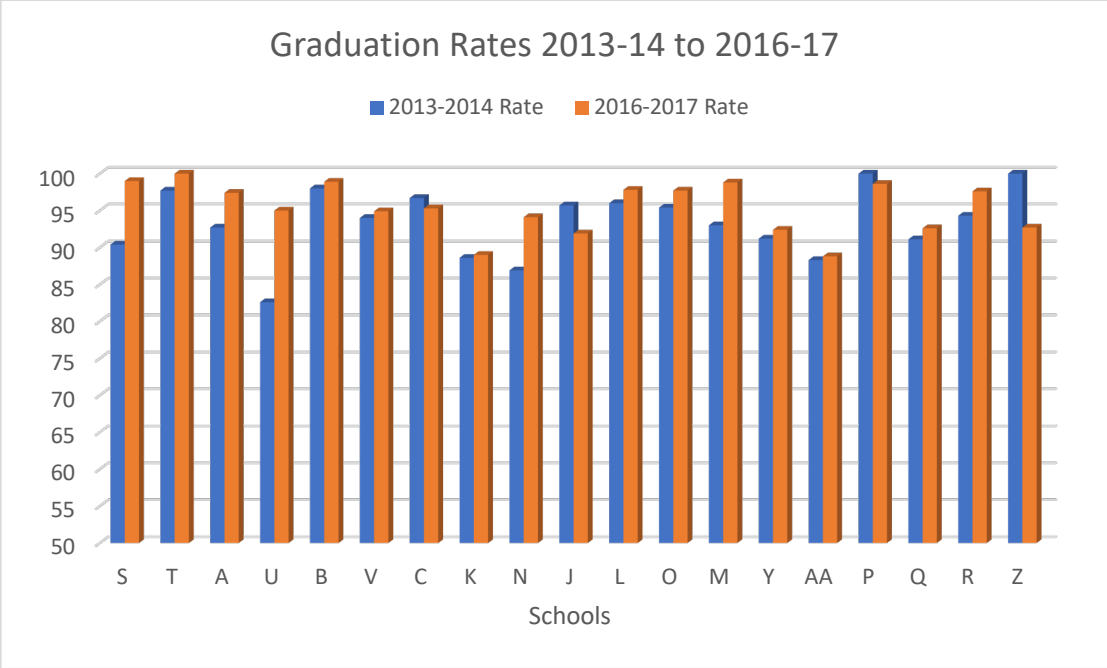

Figure 1. Graduation Rates of Schools in Cumberlands Local Workforce Area
Source: (KY Center for Statistics, 2019)

During the same school years as the graduation rate data, the Cumberlands Local Workforce Area showed an increase in the percentage of students enrolled in college, while the percentage for the Commonwealth of Kentucky decreased. The percentage of college enrollment for the Commonwealth dropped by 0.06 from 53.9 to 53.3 over the period, while the Cumberlands Local Workforce Area college enrollment percentage climbed 1.8 from 53.1 to 54.9.

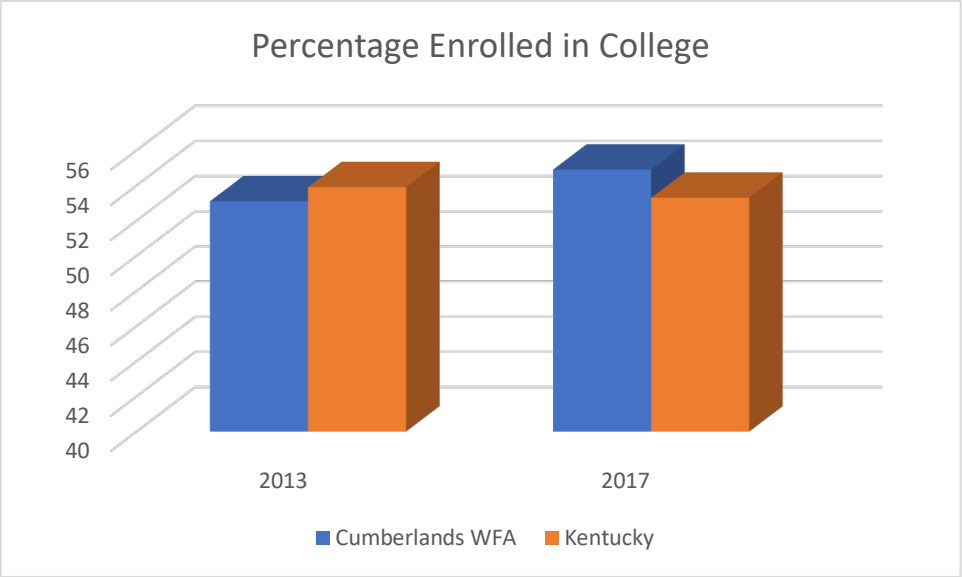

Figure 2. College Enrollment Percentages
Source: (KY Center for Statistics, 2019)

When considering completion of a continued education and not just enrollment in college, specifically student postsecondary attainment, Kentucky had lower completion rates than the nation. The percentage of people in Kentucky who had earned a bachelor's degree or higher was 22.7%, falling behind the national average of 30.3%.

Furthermore, when simply comparing continuing education as an option for Kentucky residents, relatively more people chose not to pursue further education beyond high school when compared to the nation (KY Center for Statistics, 2019).

Considering the college enrolled percentage was slightly more than 50% and the lower rate of earned bachelor's degree or higher, workforce outcomes became an important component to study when considering successful transitions after secondary graduation.

Workforce Outcomes

Workforce outcomes were reported in a variety of ways. One of the ways included all employment after graduation for students. When all of the Local Workforce Areas of Kentucky were compared, the data showed only two had a decrease in employment rates one year after graduation for the 2013 and 2017 graduates. The Cumberlands Local Workforce Area showed the third highest rate of employment for 2017 graduates and the second largest jump in rate from 2013 graduates to 2017 graduates (KY Center for Statistics, 2019).

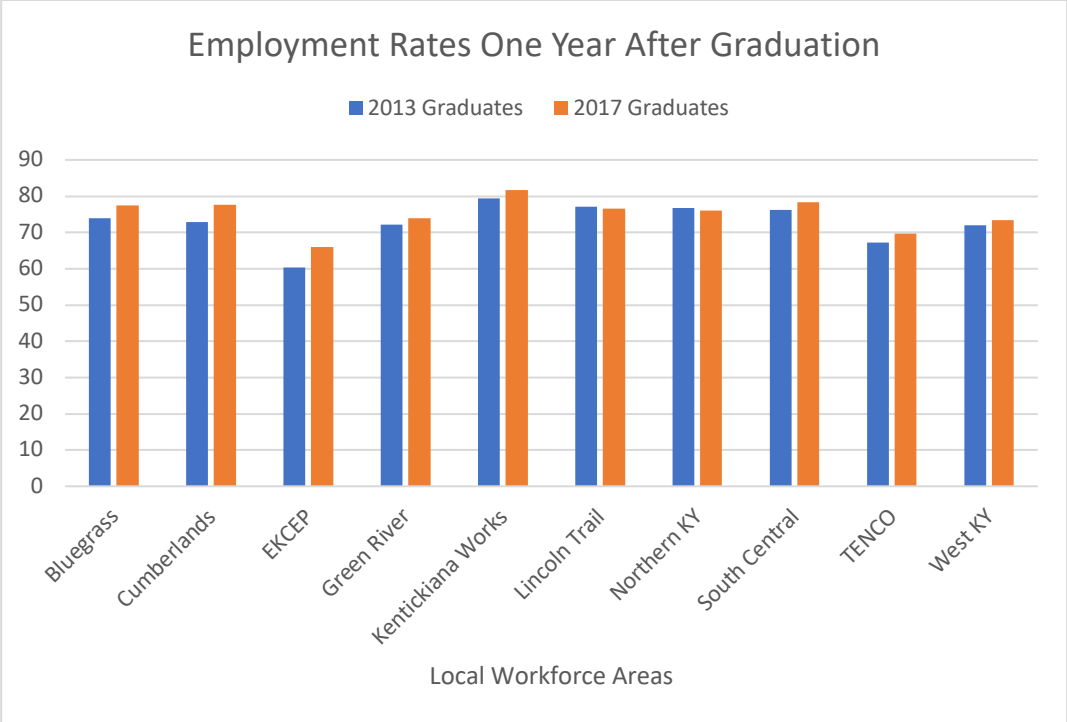

Figure 3. Kentucky Graduate Employment Rates
Source: (KY Center for Statistics, 2019)

Another reported method excluded those students enrolled in a postsecondary institution, consequently focusing only on individuals foregoing postsecondary education and earning employment. For the purposes of this study, excluding post-secondary as a factor and focusing only on employment data after high school graduation was the method which provided the necessary data for the chosen research questions.

The data reported from fiscal year 2017 in Kentucky, showed students who reached pathway completion status by completing a secondary program had a 73.7%

likelihood of being employed the year after graduation. Students who did not complete a pathway yet took enough courses to reach the preparatory status (completion of two classes and enrolled in a third class) showed a 70.1% employment in the following year after graduation. The completers employment percentage remained consistent through a five-year period after graduation, while the preparatory students increased their employment percentage to 71.5% five years after graduation. Each of these pathway status categories demonstrated a higher likelihood of employment than students not invested in a pathway and subsequently labeled as non-preparatory students who showed only 63.5% likelihood of employment after one year and 65% five years beyond graduation (KY Center for Statistics, 2019).

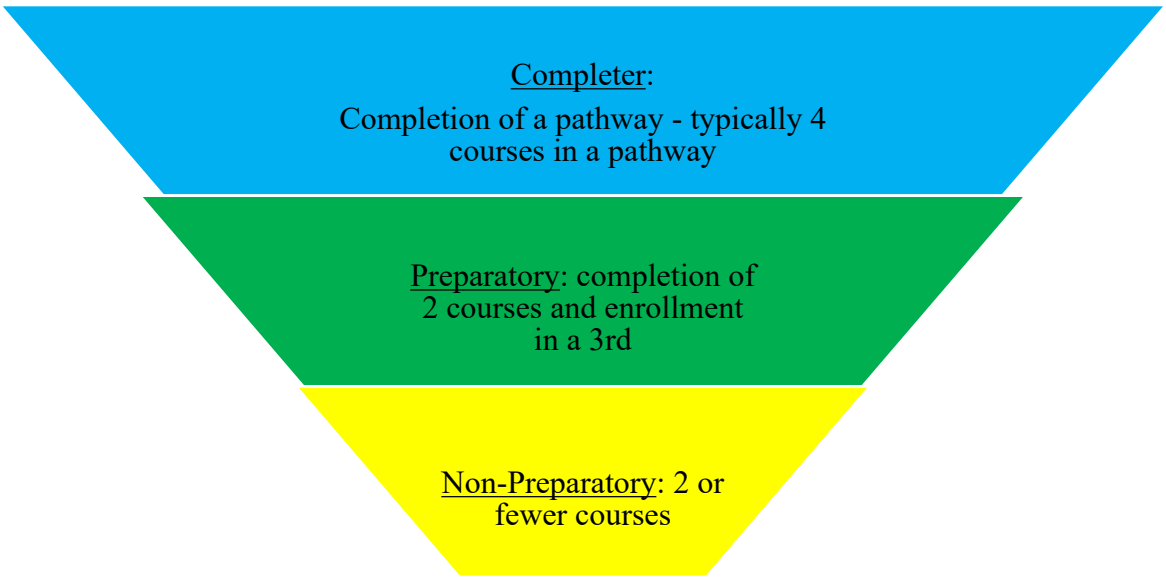

Figure 4. Hierarchy of Carl D. Perkins Classifications

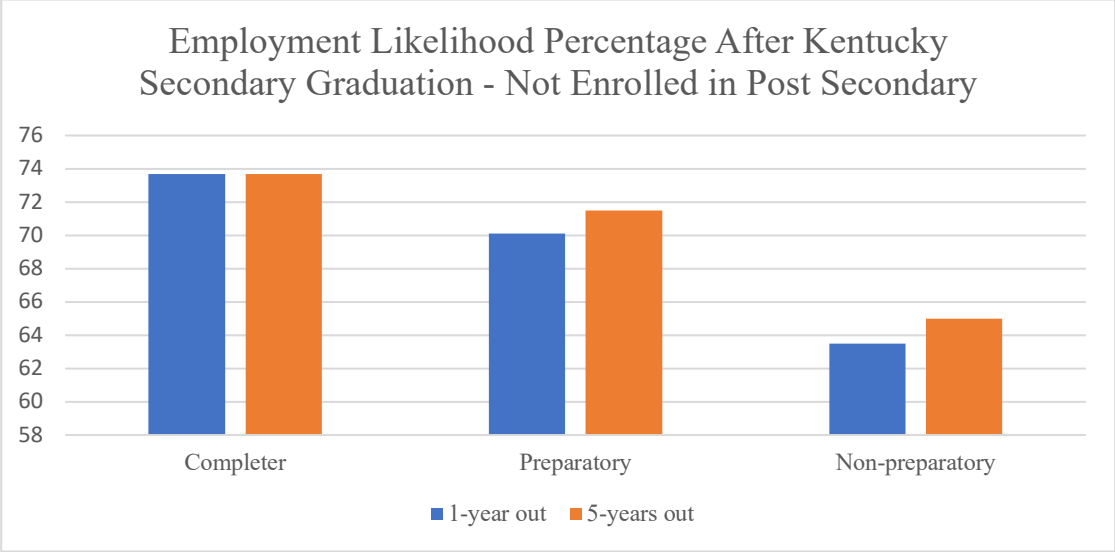

Figure 5. Post-Graduation Employment Comparison
Source: (KY Center for Statistics, 2019)

This data demonstrated that nearly three-fourths of graduating students not enrolled in post-secondary, but who still completed a pathway during high school, earned employment soon after graduation. However, this data did not distinguish the specific pathway in which a student participated nor show if their employment corresponded to the student's pathway area.

Data existed which showed the number of graduates in their credentialed area and whether they were employed in the field only. It compared it to those that were employed in their credentialed area, but were also pursuing additional education or were part of an apprenticeship in their area. The graphs below illustrate the numbers represented by 2013-2014 school year graduates and 2017-2018 school year graduates. This data was not disaggregated into the different pathway areas, however, and did not demonstrate if the employments were in the high demand areas focused on for this study; health care, manufacturing, or transportation.

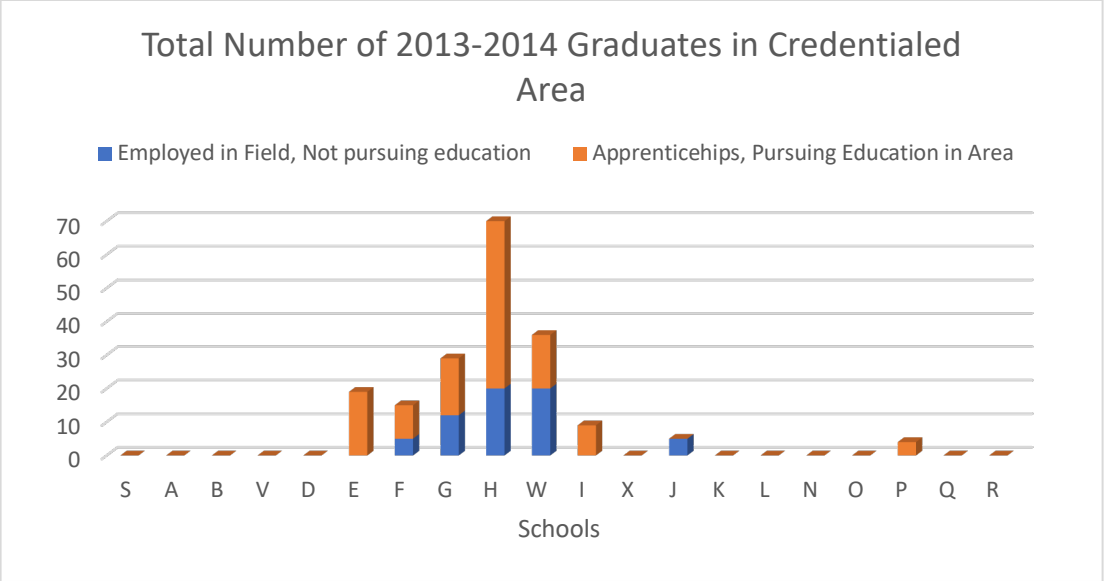

Figure 6. 2013-2014 Graduates in Their Particular Credentialed Area
Source: (KY Center for Statistics, 2019)

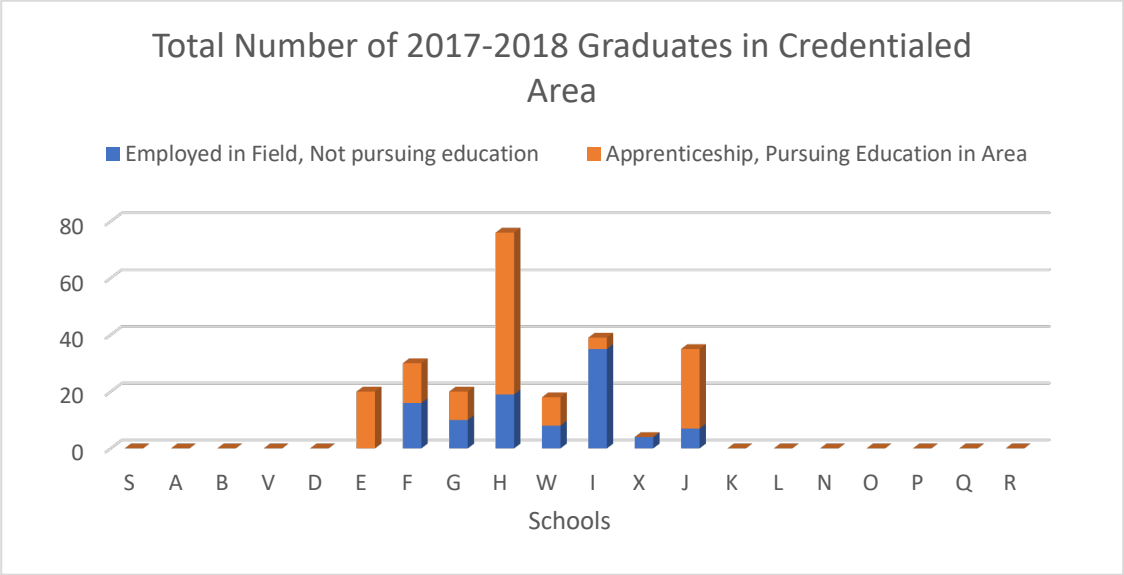

Figure 7. 2017-2018 Graduates in Their Particular Credentialed Area
Source: (KY Center for Statistics, 2019)

Other notable employment information focused on the workforce location reported for Kentucky and all of its residents. This data was considered relevant as graduating students needed opportunities for employment. In 2018, people that worked in Kentucky tended to live in Kentucky as 88.4% of the workforce of Kentucky resided in the Commonwealth. There were only 5.6% of Kentucky residents that left the Commonwealth's borders to work in other States. Additionally, only 6% of commuters from other States traveled to and worked in Kentucky (KY Center for Statistics, 2019).

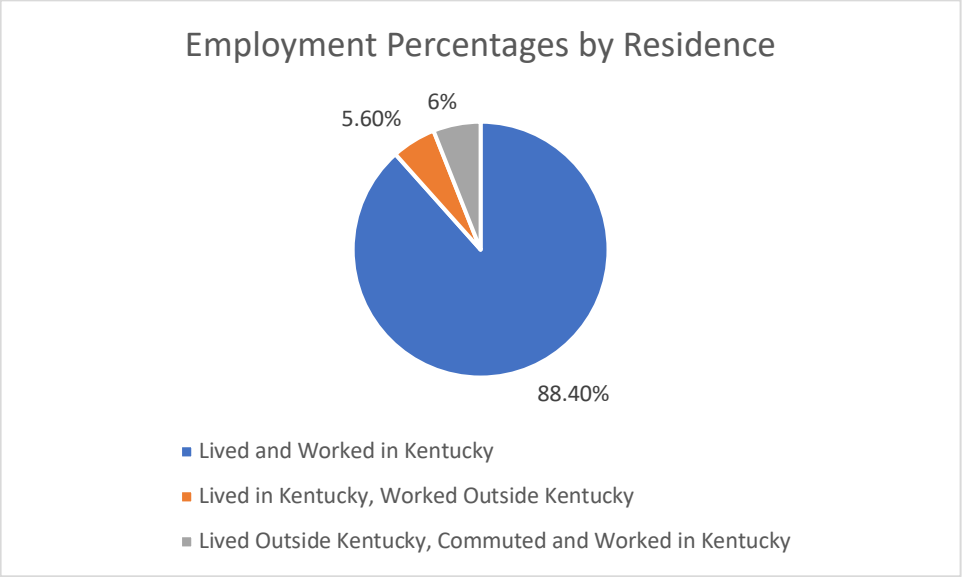

Figure 8. Kentucky Workforce Residence Chart
Source: (KY Center for Statistics, 2019)

Kentucky Local Workforce Areas

The Kentucky Center for Statistics, for purposes of educational and workforce data collection, had divided the 120 counties of the Commonwealth into 10 local workforce areas. These areas were based on geographic location and similar demographics within an area. The following table provides a list of the workforce areas including the number of counties that comprised each area. Additionally, the map created by Kentucky Center for Education and Workforce Statistics illustrated the geographical layout of the workforce areas in Kentucky, including borders.

Table 2. Kentucky Local Workforce Areas

Local Workforce Area Name	Counties Included
Bluegrass	17
Cumberlands	13
Eastern Kentucky Concentrated Employment Program (EKCEP)	23
Green River	7
Kentuckiana Works	7
Lincoln Trail	8
Northern Kentucky	8
South Central	10
TENCO	10
West Kentucky	17

Adapted from KY Center for Statistics (2019)

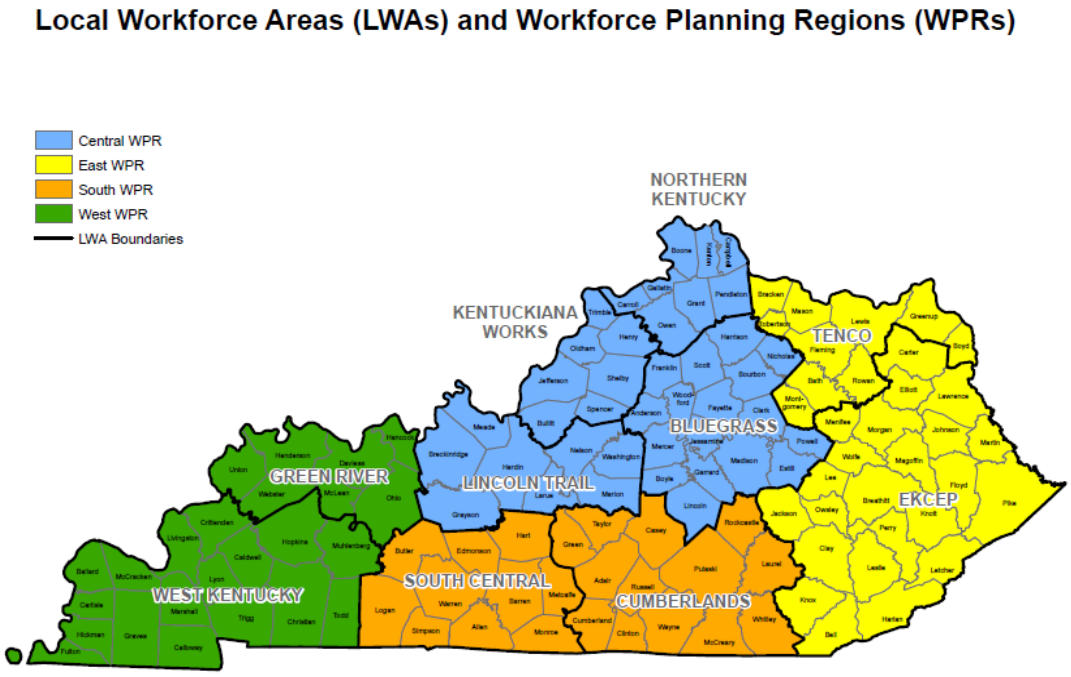

Figure 9. Map of the Local Workforce Areas in Kentucky
Reprinted from KY Center for Statistics (2019)

Although the Commonwealth was divided into ten Local Workforce Areas based on location and demographics, the population from one area to another greatly varied. Due to a few larger cities and more dense populations, greater than half of the Commonwealth's population lived in three of the Local Workforce Areas; Bluegrass, Kentuckian Works, and Northern Kentucky. The Commonwealth's population was also considered relatively homogeneous as 85% of the total population was classified as White, Non-Hispanic, compared to the national average of 61.3% (KY Center for Statistics, 2019).

This study focused on the Cumberlands Local Workforce Area of Kentucky. The Cumberlands Local Workforce Area was located in the South Workforce Planning Region and was the sixth most populous Local Workforce Area in Kentucky. The Cumberlands Local Workforce Area consisted of thirteen counties and the population in 2016 was reported to be 321,305. Counties included in the Cumberlands Local Workforce Area were Adair, Casey, Clinton, Cumberland, Green, Laurel, McCreary, Pulaski, Rockcastle, Russell, Taylor, Wayne, and Whitley Counties. The population was not evenly distributed, with more than one third of the people living in Pulaski and Laurel counties. In 2016, the Cumberlands Workforce Area was comprised of 94.3% residents classified as White, Non-Hispanic, which was greater than the statewide average of 85% (KY Center for Statistics, 2019).

Within the thirteen counties, there were nineteen total public-school districts that contained high schools. Included in the thirteen counties were seven Commonwealth-owned and operated Area Technology Centers. These Area Technology Centers were not stand-alone schools with their own separate enrollment population. Instead, while each Area Technology Center might have had a few non-public school students enrolled, most of their enrollment was accounted for by attending students from their local public-school districts. Additionally, in the Cumberlands Local Workforce Area, there was a locally district-owned technology center serving students from its particular county (KY Center for Statistics, 2019).

Research Question 1

Is there a significant difference in the number of industry certifications earned from graduating students in the Cumberlands Region of Kentucky between the school years 2013-2014 and 2017-2018?

Industry certifications had become a greater focus in Kentucky schools during the previous few years. Part of the focus was to provide students with opportunities to better prepare for post-graduation life, but part of the focus was also due to the Commonwealth's accountability on secondary schools. As accountability changes were implemented, the new calculation methods provided a variety of approaches graduating students could earn the transition-ready or career-ready label. With the changes, schools no longer relied largely on national testing scores, but instead provided students additional opportunities for transition readiness as they neared graduation. These opportunities provided potential benefit to both the individual students and the schools and seemingly increased the participation in transition ready programs which led to industry recognized certifications, particularly in the high-demand areas included in this study - healthcare, transportation, and manufacturing. During the 2013-2014 school year, 518 total industry certifications in those high demand areas were awarded in the Cumberlands Workforce Area of Kentucky. Following the increased focus, the number of industry certifications nearly tripled to 1350 total industry certifications in the 2017-2018 school year. Of the reporting schools in this study, only three showed a decrease in certification numbers from the 2013-2014 to 2017-2018 school years.

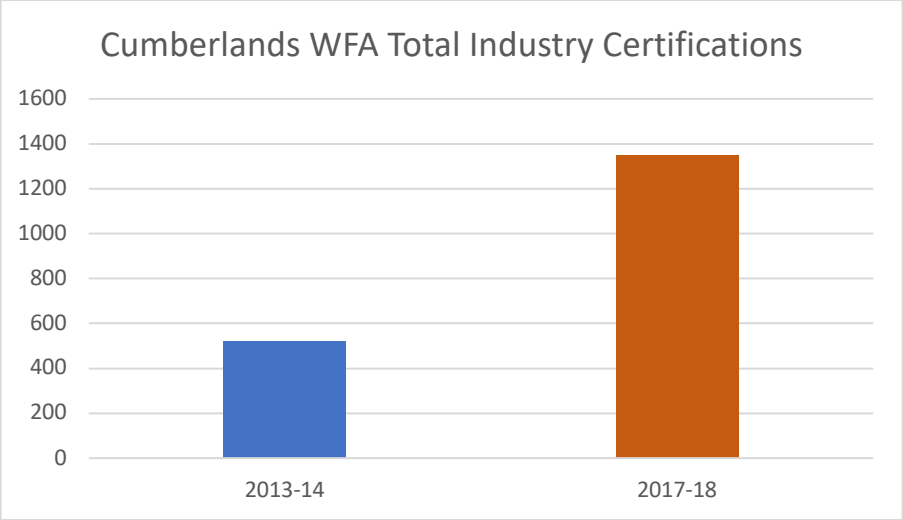

Figure 10. Total Industry Certificates in High Demand Areas for Cumberlands LWFA

Source: (KY Center for Statistics, 2019)

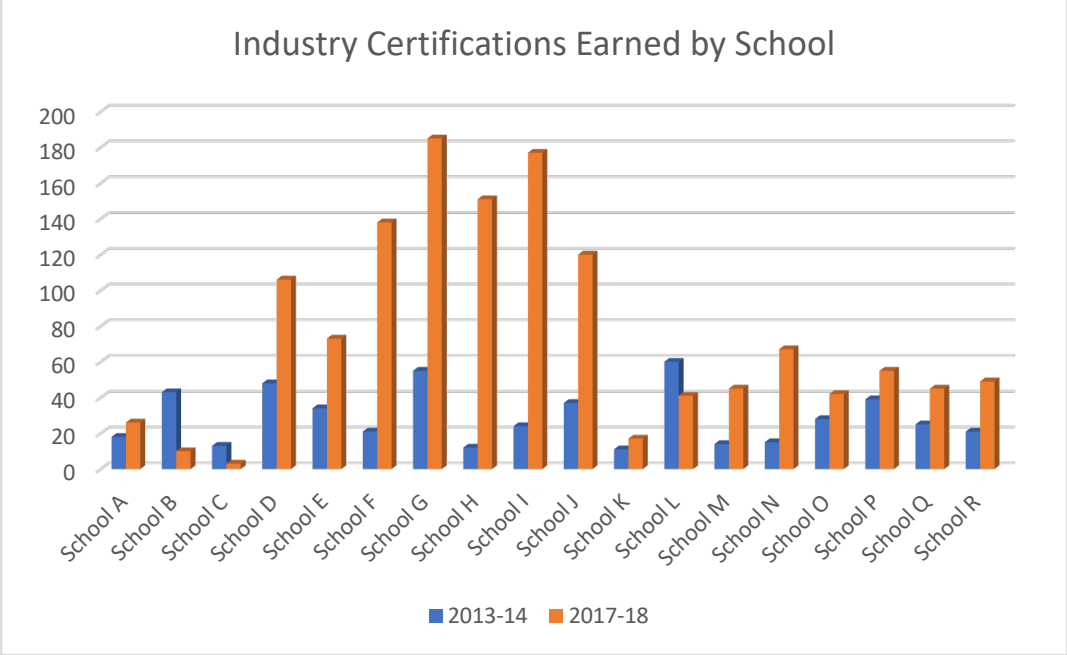

Figure 11. High Demand Industry Certificates by School

Source: (KY Center for Statistics, 2019)

A paired sample t-test was run on this industry certification data and the following results were output:

Table 3. Paired Sample t-test Statistics: Industry Certifications

Paired Sample Statistics

Industry Certifications	*Mean*	*N*	*Std. Deviation*	*Std. Error Mean*
Year 2013-2014	28.78	18	15.268	3.599
Year 2017-2018	75.00	18	57.188	13.479

Table 4. Paired Sample t-test Correlations: Industry Certifications

Paired Samples Correlations

		N	*Correlation*	*Sig.*
Year 2013-2014	*&*	18	.201	.423
Year 2017-2108				

Table 5. Paired Sample t-test: Industry Certifications

Paired Samples Test

	Mean	*Std. Deviation*	*Std. Error Mean*	*95% Confidence Interval of the Difference*	
				Lower	*Upper*
Year 2013-2014 & Year 2017-2108	18	.201	.423	-74.142	-18.302

Paired Samples Test cont.

		t	*df*	*Sig. (2-tailed)*
Year 2013-2014 & Year 2017-2108		-3.493	17	0.003

There was a significant difference in the number of industry certifications earned in the school year 2013-2014 (M = 28.78, SD = 15.268) and the school year 2017-2018 (M = 75.00, SD = 57.188); t (17) = -3.493, p = 0.003. For schools and students, this was a desired outcome as the significantly higher mean represented a greater number of students earning industry certifications during the 2017-2018 school year than had been earned during the 2013-2014 school year.

Research Question 2

Is there a significant difference in the number of students gaining employment in their credentialed area between the school years 2013-2014 and 2017-2018 in the Cumberlands Region of Kentucky?

As explained by signaling theory, there is uncertainty on the part of both employers and job applicants about the best way to identify individuals with the necessary skills and abilities to fill vacant positions. Credentials and certifications play a signaling role by providing potential employees a way to indicate their fit for a particular vacancy and for employers to quickly identify employees who can perform on the job with minimal additional training (Bartlett K. , 2012).

This study was designed to discover if the employers and schools were connected with these signals; the certifications earned during secondary school by students. The focus for research question one was the actual credential, which could have acted as a signal for employees that a student had earned an industry recognized certification and was ready for employment. Research question two was designed to determine how the employment numbers of those particular graduating students increased, decreased, or remained constant over the same time period as research question one.

During the 2013-2014 school year, there were sixty-two total employments in the credentialed area reported by schools in the Cumberlands Work Force Area. The number of employments in the credential area for the 2017-2018 school year increased

to ninety-five. Of the reporting schools, only six schools had numbers large enough to be reported and only five of those had numbers reportable each time.

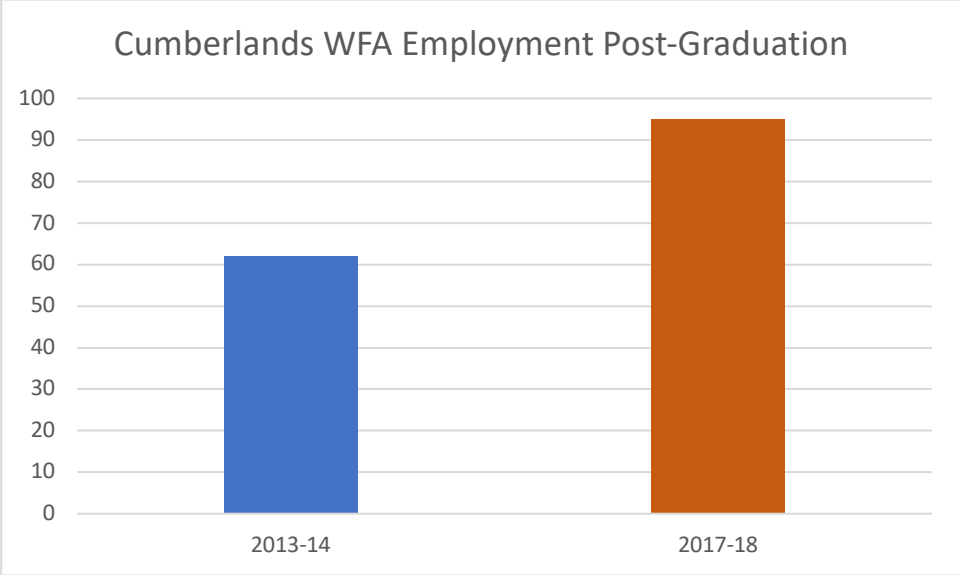

Figure 12. Total Employment in Particular Credentialed Area Post-Graduation
Source: (KY Center for Statistics, 2019)

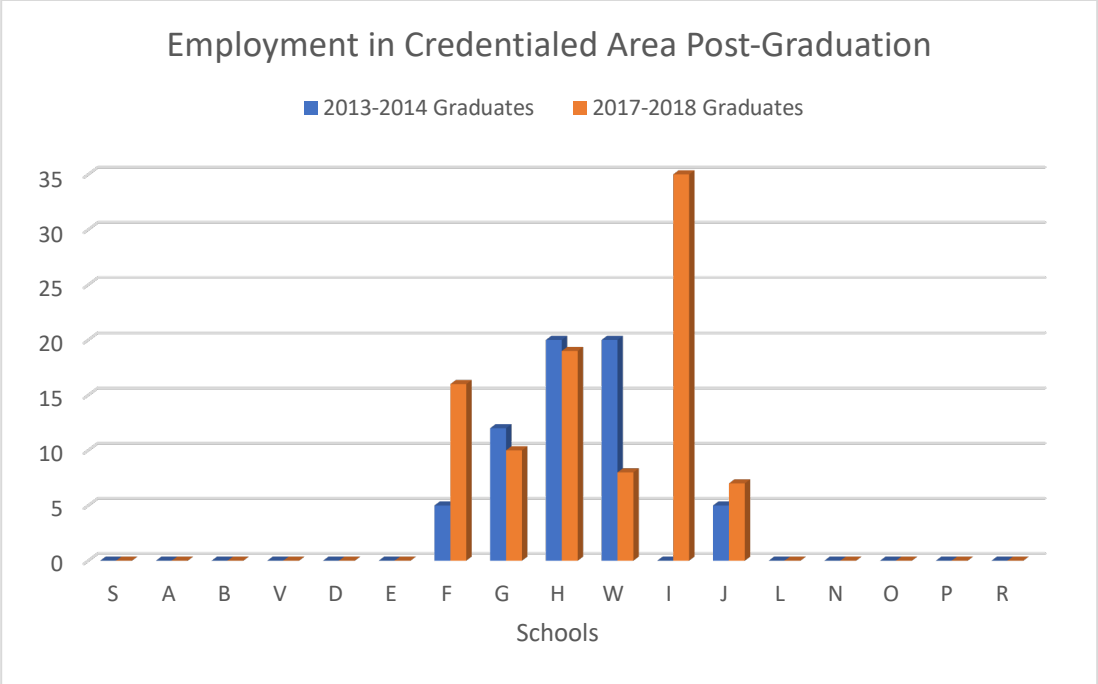

Figure 13. Employment Post-Graduation by School
Source: (KY Center for Statistics, 2019)

Due to the low reported numbers from the schools for employment of graduates in their particular credentialed area, there is insufficient data for the planned statistical analysis. Most schools reported numbers of employment for 2017-2018 graduates at or below three which resulted in the Commonwealth redacting those numbers for confidentiality reasons. Redacted numbers were represented with an asterisk in the original data and therefore it was unknown if the redacted number was three, two, one, or zero. To maintain the integrity of a correlational analysis, it was decided that the sample size in this instance was too small for an effective statistical analysis.

For schools and students in the Cumberlands Local Workforce Area, this was a less than desirable outcome as it represented very few total employments reported by schools for the 2013-2014 and 2017-2018 graduating students in their credentialed area. While most schools reported data of three or less, resulting in their data being redacted, there were data reported by a few schools. Notably, five of six schools were Area Technology Centers which reported numbers for both school years. However, even in this extremely small data set, half reported an increase and half reported a decrease, showing possible inconsistencies when comparing industry certifications earned to employment of graduates during those years.

Research Question 3

What is the correlation between number of industry certifications earned and the number of students gaining employment in their credentialed area between the school years 2013-2014 and 2017-2018?

This researcher designed the study for the purpose of determining the correlation between industry certifications earned by students and their subsequent employment post-graduation in the credentialed pathway area. Data from research question one, demonstrated that an increase in industry certifications existed from the 2013-2014 school year to the 2017-2018 school year. Data from research question two was inadequate to perform the statistical analysis. The lack of non-redacted data across the Cumberlands Local Workforce Area for employment of graduating students demonstrated employments were not keeping pace with the increase in industry

certifications earned. Regardless of the minimal data for employment, statistical analysis was still able to be performed to determine the type of correlation that existed between the two variables.

First, a paired sample t-test was performed and the following tables contain the data output.

Table 6. Paired Sample t-test Statistics: Industry Certifications and Employment

Paired Sample Statistics

	Mean	*N*	*Std. Deviation*	*Std. Error Mean*
Year 2017-2018 certs	75.00	18	57.188	13.479
Year 2017-2018 jobs	5.28	18	9.560	2.253

Table 7. Paired Sample t-test Correlations: Industry Certifications and Employment

Paired Samples Correlations

		N	*Correlation*	*Sig.*
Year 2017-2018 certs	&	18	.274	.271
Year 2017-2108 jobs				

Table 8. Paired Sample t-test: Industry Certifications and Employment

Paired Samples Test

	Mean	*Std. Deviation*	*Std. Error Mean*	*95% Confidence Interval of the Difference*	
				Lower	*Upper*
Year 2017-2018 certs & Year 2017-2108 jobs	69.722	55.334	13.042	42.205	97.239

Paired Samples Test cont.

		T	*df*	*Sig. (2-tailed)*
Year 2017-2018 certs & Year 2017-2108 jobs		5.346	17	.000

There was a significant difference in the number of industry certifications earned during the 2017-2018 school year (M = 75.00, SD = 57.188) and the number of employments of the 2017-2018 graduates (M = 5.28, SD = 9.560) in their particular credentialed area; t (17) = 5.346, p = 0.000. For schools and students, this was not a desired outcome as the significant difference represented very few of those students earning certifications gained employment in their credentialed area.

Next the bivariate correlation, as intended to be used in research question three, was performed on the data. The data output is shown in the following table:

Table 9. Correlations Between Employment and Industry Certifications

Correlations 2017-2018 Employment and Certifications

		Year 2017-18 Certs	*Year 2017-2018 Jobs*
Year 2017-18 Certs	Pearson Correlation	1	.274
	Sig. (2-tailed)		.271
	N	18	18
Year 2017-18 Jobs	Pearson Correlation	.274	1
	Sig. (2-tailed)	.271	
	N	18	8

The results of the Pearson Correlation indicated there was not a significant positive association between industry certifications earned during 2017-2018 and 2017-2018 graduates gaining employment in their credentialed area; $r(17) = 0.274$, $p = 0.271$.

This bivariate correlation represented a less than desirable outcome for schools and students as it also represented very few of the 2017-2018 graduating students earned employment in their credentialed area.

Summary

Chapter 4 included data and discussion of results from the paired sample t-test and the bivariate correlation analyses as well as visual representations of the results in tables and charts. Chapter 5 includes the summary, conclusions, and recommendations for future researchers.

Chapter 5: Summary, Conclusions and Recommendations

Summary of Results

The results of this study suggest that earning of industry recognized certifications during secondary school in the high demand areas of healthcare, manufacturing, and transportation did not lead to an increase in post-graduation employments for those high school graduates in their particular credentialed pathway in the Cumberlands Local Workforce Area of Kentucky from the school year 2013-2014 to the school year 2017-2018. Encouragingly, over the span of the school years researched in this study, there was found to be a significant increase in the number of industry certifications earned during secondary. During that same time, there was a slight increase in graduate employment numbers. However, there was found to be no positive correlation between the earned industry credentials during high school and the number of employments post-graduation, excluding those students furthering their education through a post-secondary option.

The specific region researched in this study, the Cumberlands Local Workforce Area, showed great increases in industry certifications over the time span studied. Based on accountability changes and addition of certificate stacking – in which some pathways began to require more than one certification assessment for credentialing – these increases were anticipated and also encouraging for Career and Technical Education in Kentucky and the Cumberlands Workforce Area. A greater number of certifications and more students were reaching the transition readiness benchmark for the Commonwealth

of Kentucky. Unfortunately, data reporting for employment numbers of graduates in their credentialed area were extremely low. Nearly all of the public-school high schools reported such few numbers the Kentucky Department of Education redacted much of the data. Of the schools which did report numbers large enough to remain unredacted, it is of note Area Technology Centers dominated the list. The Area Technology Centers, although reliant upon local public-school districts for students, are designed to offer courses and certifications in technical areas corresponding to the needs of their local communities. The data reported showed an overall increase in employments for the Area Technology Centers in the Cumberlands Workforce Area, but still demonstrated inconsistencies in growth, as some showed gains while others showed regression in employment numbers for graduates.

Connection to Research

As indicated by research in the literature review, the signaling role of industry certifications can play a part in graduates gaining employment post-graduation. According to the signaling theory, earned certifications or credentials provide an indication for employers that the potential employee could be a fit for a vacancy. This identifier also indicates that the credentialed graduate may be able to perform on the job with minimal additional training (Bartlett K. , 2012). Uy and Green additionally noted the importance of the signaling role with their connection of assessments as a credentialing tool to workplace entrance (2009). Data from this study suggests the

certifications earned did not yet lead to significant gains in employment numbers, although some Area Technology Centers did show substantial increases.

While the Carl D. Perkins Career and Technical Education Act of 2006 seems to have brought a greater awareness to certifications as potential signals, the assessment and accountability portion possibly caused schools to heavily work on standards and preparedness instead of employer and community connections. The latest Carl D. Perkins Act seems to have shifted focus more toward the community connections with the increased requirements for representatives and committee members who are stakeholders in the community as well as encouraging alignment of secondary and post-secondary schools in a regional area.

Conclusions

The number of industry certifications in the high demand areas of healthcare, manufacturing, and transportation earned by students in the Cumberlands Local Workforce Area of Kentucky significantly increased from the 2013-2014 school year to the 2017-2018 school year. This demonstrated success coincided with the increased focus on Career and Technical Education and changes in accountability which began to include career readiness and transition readiness rather than primarily the college readiness emphasis. This positive increase was shown across nearly the entire Cumberlands Local Workforce Area and may soon align with an increase in employments for secondary graduates as changes continue to occur.

The number of employments researched in this study, however, did not show a significant correlation to the growth in industry credential numbers. The data required for the bivariate correlation analysis was incomplete as most high schools reported numbers of three or less, resulting in the Commonwealth redacting those numbers for confidentiality purposes. The redacted numbers not only caused the data from this research to show a lower total number for the Cumberlands Workforce Area (redacted numbers were unknown and therefore were recognized as a zero), they also prevented this researcher from knowing if those schools had reported any numbers above zero in either of the school years. Small progress could have been made from the 2013-2014 to 2017-2108 school years, however due to the reporting method it is unknown from this study.

Area Technology Centers generally reported numbers of employments for each of the school years. As reported in the results and analysis, there was a total increase in this number when considering only the Area Technology Centers, although some showed a decrease and some showed an increase. While a significant relationship what not shown, this statistic nevertheless demonstrates that Area Technology Centers, especially when compared to their partnering high schools, were able to place some students into employment opportunities corresponding to their pathway of study.

While schools within the Cumberlands Local Workforce Area of Kentucky were the focus of this research, business and industry was also a factor in the employment numbers. According to the statistics, the Cumberlands Local Workforce Area did not

take advantage of the hiring potential afforded to them by credentialed graduates. The local employers were not contacted by the researcher for potential reasoning which could have been attributed to lack of applicants from those graduating during the time span or poor fits of applicants for a particular job, in addition to the actual job availability for each employer.

One of the qualifiers for this specific research included only graduating students entering the workforce after secondary graduation. This research did not account for students whom decided to further their education through universities, colleges, or community colleges prior to gaining employment. Research supports, as included in the Literature Review, taking Career and Technical Education courses during high school typically predicts greater success in college. With this predictor, the researcher understood many students may have pursued further education prior to searching for employment, whether based on personal decisions or guidance from counselors, teachers, and administrators from their respective schools. The reported employment numbers from the high schools in this study may have showed fewer graduates earning employment but there may have been higher numbers of graduates from Career and Technical Pathways entering a college or University.

Limitations

After data collection and analysis, an additional limitation was uncovered by the researcher. With a focus only on the Cumberlands Local Workforce Area of Kentucky, which consisted of thirteen counties, the sample size ended up being low. While the

population in the Cumberlands Local Workforce Area could have supported a higher sample size, reported numbers from schools was a limitation. As discussed, many schools in the study had numbers which were reported as zeros when considering employment of graduates. Due to the lack of schools with reportable numbers and the subsequent overall low sample size for the one local workforce area of Kentucky, the statistical power of the data was low.

Implications

The results of this study highlight a disconnect that existed between graduates with industry credentials and their employment in their particular credentialed area. The statistical gap which was uncovered may close as the updates and changes to the latest Carl D. Perkins Act take their full effect. Accountability changes which involved more focus on transition readiness (including career and work readiness as opposed to only college readiness) for students, as researched in the Literature Review, also may take time to progress in being able to show the post-graduation benefits for students. The accountability model in place during the time frame for the research awarded extra points to schools for students achieving both college and career readiness. This provided opportunities for schools to further their standing in the accountability model and could have been a factor in creating a disconnect between certifications earned and students seeking employment post-graduation.

Research indicated that Career and Technical Education provided benefits, not only for traditional vocational education type courses such as welding and automotive,

but for healthcare pathways and other Science, Technology, Engineering, and Mathematics pathways. With healthcare and manufacturing as two of the high demand areas in the Cumberlands Local Workforce Area, these pathways, which were often associated with the high school 'academic' offerings, sometimes were ignored as Career and Technical pathways and also were considered legitimate STEM pathways as discussed by Fletcher and Tyson (2017). In addition to their research showing Career and Technical Education's legitimacy for the traditionally academic pathways, they also noted the importance of strengthening high school programs and guidance in the programs to broaden participation of minorities and women in the STEM and Health fields. These statements were encouraging for Career and Technical Education as it showed potential career opportunities and benefits for students seeking jobs who were in the previously traditional academic only pathway.

However, regardless of the many benefits of Career and Technical Education afforded to students through participation in a program pathway and industry certification, the data from this study has also brought up questions surrounding the students and their paths toward employment after graduation. The data demonstrates a lack of correlation, positive or negative, between earned industry certifications by students and their employment in the field. The statistics do not expand on the implications of this. Students graduating with credentials did not go on to employment in the area at a significant rate, especially students who took Career and Technical Education courses through their high school as opposed to those taking courses in an

Area Technology Center. This could have been due to a variety of reasons. If students are simply not following through in the career pathway, then intentional conversations for career pathway guidance must increase in the schools and community. If graduates are not filling vacancies in the community job market, particularly if they possess the required credentials, the relationship with local businesses and the schools needs to strengthen for the sake of local education and its economy.

Students may be playing a role in the disconnect. The data suggested that Area Technology Center students were experiencing some success in obtaining employment after graduation while other high school students were less successful. If students were self-selecting for their career pathway choices and course selections by choosing to attend an Area Technology Center, does this make them more likely to enter the field immediately after high school? If the answer to this is yes, it should be considered if students were self-tracking and if natural demographics played a role in which students chose this path. According to research by Meer, these things may even lead to differences in earnings in their career (2007). If students were self-selecting for participation in the Area Technology Centers, those students showed more success in gaining employment post-graduation. Whether due to demographics or by chance, data demonstrates those students had a greater rate of earning a job after high school. Career guidance should become an increased focus in high schools as students make choices, regardless of their career aspirations, to ensure self-selection by students was not random and a driving force which caused the gap between credentials earned and

employment. While many students perhaps chose furthering education prior to employment searching, the role of counselors and teachers becomes magnified to ensure students are considering multiple possible career options during their secondary career.

Another implication of this study could be how schools, whether the traditional high school or an Area Technology Center, see their role as a school. The data from this study suggests Area Technology Centers do a better job than public-high schools of placing graduates in employment vacancies. However, according to Wright, Washer, Watkins and Scott, there is evidence that suggests Technical Education may have the perception of being a career program for students as opposed to college preparatory subjects (2008). With this suggested perception, the Area Technology Centers possibly could have focused more on supporting students for employment and possibly in their employment search. The opposite perception for non-Career and Technical Education would then have had high schools preparing students more for post-secondary education instead of pursuance of employment. This perception, addressed by Wright, et.al, could have been a factor that led to the lack of correlation when considering the schools of the Cumberlands Local Workforce Area. The guidance provided by schools to students should consider the needs of the local communities as well as the desires of the student when assisting in making course choices and ultimately career pathway decisions. This type of guidance and support may have been accomplished, as post-secondary data with pathway continuation was not researched in this study.

Carl D. Perkins Acts

The latest changes made in the reauthorization of the Carl D. Perkins Act, reauthorized at the end of this study's time span, did not have an effect on the data in this study. The newest version of the Act forced a more regional approach for participating schools. In the Cumberlands local Workforce Area and all of Kentucky, schools are required to coordinate stronger relationships and establish career pathways that continue through post-secondary institutions. Community input will be sought from an entire region around a post-secondary institution and include an analysis of employer needs and projections. Stakeholders, to include community, school, and parent representatives, are required to have more involvement in the discussion and decision process in Kentucky through the changes. As noted by Granovskiy, under Perkins V, the Career and Technical Education providers are required to carry out a needs assessment. The needs assessment is purposed to better align the programs of study with local labor market needs and the in-demand occupations in the area (2018). The requirements of Perkins V should aid in the development of more communication and potentially a strong positive correlation between industry credentials earned and subsequent employment of graduates from secondary institutions.

Kentucky Recruitment Programs

Apprenticeships. The Tech Ready Apprentices for Careers in Kentucky (TRACK) youth pre-apprenticeship program is a partnership between the Kentucky Department of Education's Office of Career and Technical Education and the Kentucky

Labor Cabinet to provide secondary students with career pathway opportunities into Registered Apprenticeship programs (Taylor, 2019). Based on the data from this study, this type of program could strengthen the correlation between credentials earned and employment. This pre-apprenticeship program is designed to create a direct avenue for students through a pathway which creates connections to an employer and can possibly lead to a long-term job or even career. While not part of this study, the amount of apprenticeships in Kentucky is still a small number (KY Center for Statistics, 2019). As the program continues to grow and develop it could be a way schools are able to engage local businesses in conversations about employing graduates. The design of the TRACK program even allows the employer the flexibility to adapt the program for the needs of their business. Students must apply for the pre-apprenticeship with a company, which also creates a recruiting environment where companies conduct interviews and receive recommendations which ensure students have legitimate interest in the field. The program furthermore holds great benefit for the student as they can receive a nationally recognized certification with very little or no cost in addition to the invaluable on-job training and possible full-time employment following the apprenticeship program.

Teacher Assistance. In addition to providing guidance and support to students, the teachers in Career and Technical Education in Kentucky needed assistance in planning and developing their programs and student support systems. A program that started during the end of this study's time frame was called the New Teacher Institute. It was designed to provide professional development and assistance to beginning Career

and Technical Education teachers. From curriculum support to classroom management support, the newly hired teachers were afforded resources and trainings which had never been available prior to the creation of the program. Mentor teachers and regular meetings became part of the design which not only reduced the anxieties of being in a new profession, but provided support in addition to the school level assistance. As the New Teacher Institute continues to provide new teacher directives and support, the students could benefit from the teacher understanding of career pathways and the options available for student certifications. The Institute can also provide professional development and information pertaining to the opportunities established by the Commonwealth, such as the Tech Ready Apprentices for Careers in Kentucky program which can be essential in establishing community relationships and the development of pipelines for potential student employment opportunities.

Recommendations

There are dozens of industry certifications available to secondary students in the Commonwealth of Kentucky. The importance of providing straight-forward guidance and support for students as they choose career pathways is critical for both students and the school to employment pipeline. Proper guidance is also significant to local businesses and cities as industry needs can change in the Cumberlands Local Workforce Area and in all of Kentucky based on saturation of job markets and economies. The analysis of this study's data brought several questions to the forefront for this researcher. The lack of correlation between earned credentials by graduates and ensuing

employment in their pathway area could be due to a myriad of factors. This subsequently has provided many potential avenues for further research and brought on further recommendations.

Certification Availability

This study focused on specific types of certifications. Specifically, this research was restricted to the high demand areas of healthcare, manufacturing, and transportation for the Cumberlands Local Workforce Area. These particular areas were the focus of the study due to the lack of available information concerning the relationship and benefit of the certifications for employment in the high demand sectors. However, there are many other areas and certifications available in the Commonwealth of Kentucky. The correlation concerning all certifications awarded in the Local Workforce Area and resulting employment post-graduation should be explored. The exploration could include all certification areas in Kentucky, but concerning further research from this study would be best if focused on the credentialed areas within the Cumberlands Local Workforce Area. As discussed in this study, post-secondary enrollment and attendance was a factor not considered which could have still corresponded to the career pathway for an individual. By exploring all certification areas, the relationship between graduates with any credential and their employment in industry could be determined. This data would supplement the high demand data and provide a broader picture of all graduates during those years of the study.

High School Career Pathway Guidance

High schools across the Commonwealth of Kentucky utilize school counselors in many different ways. One of the roles of a school counselor deals with recommendations of courses based on a student's career pathway choices. These pathway choices include Career and Technical Education classes, but consist of the traditionally known college preparatory classes as well. With the shift in accountability and the updates to the Card D. Perkins Act, school counselors should focus on career discussions with students, particularly those that express interest in the Career and Technical Education courses. As discussed by Sambolt and Blumenthal, college and career readiness will be of benefit to graduates whether they enter the skilled workforce or go on to college (2013). The authors also noted with accountability changes in Kentucky, the college and career readiness indicators will be an aid for schools to reach their goals in the accountability system. They went further to state, "College and career readiness is rapidly supplanting high school graduation as a key of the K-12 education system (Sambolt & Blumenthal, 2013, p. 2)."

Considering the significant role of school counselors in student course enrollment, this researcher recommends the exploration of counselor contribution to student pathway choices with participation and ensuing earning of industry certifications. School counselors serve such a variety of roles, it would be considered atypical for a school to have a counselor devoted solely to Career and Technical Education guidance. Service in a wide array of roles for school counselors may even be

a contributing factor to the disconnect uncovered in this study. School counselors may be able to focus further on pathway guidance if their roles were more defined to student guidance and career guidance as opposed to their large roles in scheduling and school logistics. As such, the exploration of this recommendation might provide insight as to the direction groups of students are steered with regards to college attendance versus employment seeking. It could uncover the mind-set that exists within high schools with regard to college attendance post-graduation. The updated Perkins Act is designed to increase the focus on career pathways and includes the pathway continuing from secondary into post-secondary.

An additional part of the career guidance should reach out to eighth grade students. As students begin working on and exploring their Individual Learning Plans (ILP), career conversations and employment opportunities must be shared and discussed. School counselors as well as administrators and teachers, should begin conversations with students which guide them to thinking beyond their next year of school and even beyond high school into thinking of their career aspirations and plans for achieving them.

Post-secondary Career Pathways

The relationship between post-secondary industry certifications and employment should also be explored. This factor was not a part of the data collected by this researcher for this study as it was designed to determine the correlation for high school students to local business employment. However, students continuing their pathway into

college and pursuing employment in their particular area would also play a major role in meeting the needs of local business and industry. This relationship will be critical for students as well and will be further analyzed as the updated Perkins Act requires better alignment from secondary to post-secondary with respect to career pathways. In addition to exploring the Career and Technical Education pathways, this researcher recommends a comparison of all college degrees leading to employment post-graduation. This further research might uncover the differences in Career and Technical Education placement versus overall placement of students to paint a picture of employment possibilities within a region and the Commonwealth.

Community Promotion

There are strong relationships that exist in each school community with Career and Technical Education. Advisory committees within each technical program are in place to work with teachers and administrators for the purpose of providing suggestions and assisting in decision making for the direction of the particular secondary program. The committee should provide insight into community and business needs and may be called upon for support of classroom needs. Due to the updated Carl D. Perkins Act, conversations with advisory committee should become stronger and have an increased focus on community employment needs. Other community relationships may exist on an individual basis or on a larger scale with the local Chamber of Commerce. All of these relationships should be leveraged to promote the positive benefits of Career and

Technical Education. Strong relationships could lead to employment and potential strengthening of the local community's economy.

According to Whitaker, the Commonwealth of Kentucky has an overall strategy to grow the state's economy and improve workforce development (2019). He claimed the changes in the accountability system support this strategy. The goal of attracting new employers and filling job vacancies with certified and well-educated, highly-skilled Kentuckians could be met under the reorganized system (KY Center for Statistics, 2019). It is recommended by this researcher to explore the differences in employment opportunities from one Local Workforce Area to another. The Commonwealth's population is concentrated in select areas and exploring the employment gained by graduates in urban areas of Kentucky versus those in rural areas could determine the effectiveness that is possible in the Local Workforce Area for credentialing of secondary graduates. If employment numbers of graduates are weak, the promotion aspect – such as community or state showcases of students, programs, and students – could be beneficial to those graduates, even if the individuals consequently find employment in another region.

Career Pathway Completers

The reauthorization of the Carl D. Perkins Act combined with the already existing relationships between Career and Technical Education program coordinators and the local community employers should only increase the focus on the high demand sectors. High demand sectors are based on current and projected needs and therefore are

likely to change over time. Certifications earned in those areas can lead to immediate employment, but could be less attractive as the job market changes. Due to this, Career and Technical Education programs must be ever changing and adapt to local needs.

In addition to programs changing, schools and Area Technology Centers must be willing to add or remove programs for the benefit of students and industry. Programs that no longer lead to employment opportunities should be considered for removal and replaced with programs that better fit the projected needs of the Local Workforce Area. This should apply to secondary and post-secondary institutions. Comments from Gasmi and Houssem in an International article, showed that higher education is one of the main suppliers of the workforce for the economy (2018). The authors went further to comment how the education sector, specifically higher education, is constantly challenged to keep up with the ever- and quick-changing industry needs. Adaptions of programs and curriculum are necessary to provide potential employees to local businesses with the most up-to-date credentials and competencies which are current in the industry (Gasmi & Bouras, 2018).

Included in the higher education pathway is the secondary education pathway. Students who choose a career pathway and continue their pathway into post-secondary may have the skills necessary to be competent and earn employment. Due to the importance of pathway completion to the student, the school, and ultimately for employment, this researcher recommends the exploration of the pathway completion rate for students in secondary and post-secondary. The further research could explore

rates of pathway completers to rates of employment in the Local Workforce Area. If completion rates are elevated and employment rates in the particular program area do not show a positive correlation, the program in question could be further analyzed for its effectiveness in preparing graduates for jobs and the industry needs in the area could be analyzed for potential vacancies. Opposite of that analysis, if pathway completion rates are low, yet employment needs are not being met, the particular program could be analyzed for its effectiveness and promoted to students and the community as opportunities for employment and community growth.

High Wage Emphasis

When considering employment and a potential worker's search for employment, high wages can be the decision threshold for the individuals. Career pathways and industry certifications prepare graduates for potential employment, but personal decisions, often based on wages, are still made when accepting a job. According to an article published through the Kentucky Department of Education, all of the secondary Career and Technical Education pathways in the Commonwealth of Kentucky were related to the top 120 occupations in the state (Office of Career and Technical Education and Student Transition, 2019). In addition, the report noted that each pathway could lead to a high-wage career.

As referenced in the Data Analysis (Chapter 4), students who completed a pathway were more likely to be employed post-graduation than non-completers. This likelihood remained true through five years after graduation for completers versus non-

completers. The report through the Kentucky Department of Education emphasized the importance of pathway completion by highlighting a return on investment analysis. The author concluded students who complete pathways achieve high wages and enroll in post-secondary institutions at rates only exceeded by students classified as exceptional (Office of Career and Technical Education and Student Transition, 2019). As part of the guidance provided for students and when considering the promotional aspect to graduates and families, an understanding of high wages could provide encouragement for students and increase their understanding of the opportunities afforded in Career and Technical Education. Due to employment wages as a potential factor, this researcher recommends the exploration of skilled-labor wage earnings as viewed by secondary graduates when deciding to search for employment or further their education through college. Ultimately exploring if having higher wage Career and Technical Education jobs versus higher wage college or university degree jobs generate a difference in what students decide to pursue after high school.

Career and Technical Education Funding

Funding support for all education and its initiatives is critical. Career and Technical Education was determined to be an important supplier of workers for the United States and a series of legislative moves and acts have led to the current Carl D. Perkins Act which supports schools in their mission to education and prepare children for the skilled work force. In addition to the Act, other funding sources can be available

through Federal and State organizations which support the work of Technical Education.

In order for future graduates of Career and Technical pathways to experience success in the workforce, the financial support must continue. Accountability measures and regulation changes can create stresses on teachers and administrators who need to remain focused on the goal of preparing students for potential employment or post-secondary enrollment. In addition, the Career and Technical Education system functions as a feeder system for business and industry throughout Kentucky and all over the United States. This researcher implores for the exploration of Career and Technical Education funding as a factor in certificate earning and graduate employments. As a part of the exploration, teacher retainment, program retainment, and school supports could play a role in how high schools and technology centers are able to funnel the designated funds toward maintaining success. With educational discussion often at the forefront of society, perceptions of school funding losses drive conversations about student attainment. This researcher suggests the exploring of how funding cuts and increases relate to the graduate employment rates within Kentucky and its Local Workforce Areas. Allowing for post-secondary enrollment as a factor, a positive correlation would signal the importance of maintaining financial support for Career and Technical Education.

Summary

Chapter 5 has provided a summary of results and included researcher conclusions and recommendations. The lack of data from the Cumberlands Local Workforce Area of Kentucky in numbers of graduates gaining employment immediately after high school, excluding those students who chose to pursue further education prior to entering the job market, provided opportunities for many different avenues for future research. This study was designed specifically to find a correlation in credentials earned to post-graduate employments for secondary school students. The benefits of Career and Technical Education, as researched in the Literature Review, can be numerous and this researcher intends to continue working in the field and uncovering positive relationships which exist.

References

Abdelaziz, B., & Gasmi, H. (2018). Education/industry collaboration modeling: An ontological approach. *In Qatar Foundation Annual Research Proceedings* (p. ICTPD1011). Qatar: Hamad bin Khalifa University Press.

Advance CTE. (2019). *Advance CTE: state leaders connecting learning to work.* Retrieved from https://careertech.org/perkins

Aragon, S., Woo, H., & Marvel, M. (2004). *Analysis of the integration of skill standards into community college curriculum*. Retrieved from National Research Center for Career and Technical Education: http://www.nccte.org/publications/infosynthesis/r&dreport/Integ_of_Skill_Stand_Ar

Arum, R., & Shavit, Y. (1995). Secondary vocational education and the transition from school to work. *Sociology of Education, 68*, 187-204.

Bartlett, K. (2012). *A theoretical review of the signaling role of certifications in career and technical education.* Atlanta, GA: Association for Career and Technical Education Research.

Bartlett, K. R., Horwitz, S., Ipe, M., & Liu, Y. (2005). The perceived influence of ndustry-sponsored credentials on the recruitment process in the information technology industry: Employer and employee perspectives. *Journal of Career and Technical Education 21*, 51-65.

Bragg, D., & Ruud, C. (2007). Career pathways, academic perfomance, and transition to college and careers: the impact of two select career and technical education transition programs on student outcomes. *In Brief*, 1-5.

Carnevale, A., Hanson, A., & Fasules, M. (2018, January 1). *Career ready out of high school? Why the nation needs to let go of that myth*. Retrieved from The Conversation: http://theconversation.com/career-ready-out-of-high-school-why-the-nation-needs-to-let-go-of-that-myth-88288

Castellano, M., Stone, J. R., & Stringfield, S. (2005). Earning industry-recognized credentials in high school: Exploring research and policy issues. *Career and Technical Education, 21*. Retrieved from http://scholar.lib.vt.edu/ejournals/JCTE/v21n2/castellano

Castellano, M., Stringfield, S., & Stone, J. R. (2003). Secondary career and technical education and comprehensive school reform: Implications for research and practice. *Review of Educational Research 73*, 231-272.

Christian, C. (2019, September 23). *Kentucky Department of Education*. Retrieved from https://education.ky.gov/CTE/teds/Pages/default.aspx

Crouch, C., Finegold, D., & Sako, M. (1999). *Are skills the answer.* Oxford: Oxford University Press.

De Brey, C. M.-F. (2019). *Status and Trends in the Education of Racial and Ethnic Groups 2018*. Retrieved from National Center for Education Statistics: https://nces.ed.gov/ pubsearch/

Dougherty, S. (2015). *The effect of career and technical education on human capital accumulation.* Storrs, CT: Center of Education Policy Analysis.

Fletcher, E., & Tyson, W. (2017). A longitudinal analysis of young adult pathways to STEMH occupations. *Career & Technical Education Research, 42*, 35-55.

Fletcher, E., & Zirkle, C. (2009). The relationship of high school curriculum tracks to degree attainment and occupational earnings. *Career and Technical Education Research, 34*, 81-102.

Gasmi, H., & Bouras, A. (2018, March). Education/Industry Collaboration Modeling: An Ontological Approach. *Qatar Foundation Annual; Volume 2018, Issue 3*, pp. 10-11.

Gewertz, C. (2019, January 24). *Education Week*. Retrieved from U.S. High School Grad Rate Reaches Another All-Time High. But What Does It Mean?: https://blogs.edweek.org/edweek/high_school_and_beyond/2019/01/2017_high_school_graduation_rate.html

Granovskiy, B. (2018). *Reathorization of the Perkins act in the 115th Congress: the strengthening career and technical education for the the 21st century act.* Washington, D.C.: Congressional Research Service.

Hart, P. (2005). *Rising to the challenge: Are high school graduates prepared for college and work.* Washington, D.C.: Achieve, a nonprofit organizaiton for education reform.

Holzer, H., & Nightingale, D. (2007). Reshaping the American workforce in a changing economy. In R. Lerman, *Career-focused education and training for youth* (pp. 41-90). Washington D.C.: The Urban Institute Press.

Hull, D. (2005). *Career pathways: Education with a purpose.* Waco, Texas: Center for Occupational Research and Development.

Jacob, B. (2017, October 5). *What we know about career and technical education in high school*. Retrieved from Brookings: https://www.brookings.edu/research/what-we-know-about-career-and-technical-education-in-high-school/

Kemple, J. (2008, June 1). *Career academies: long-term impacts on work, education, and transitions to adulthood*. Retrieved from MDRC: https://www.mdrc.org/publication/career-academies-long-term-impacts-work-education-and-transitions-adulthood

Kentucky Education & Workforce Development Cabinet. (2019, May 9). *KYForward*. Retrieved from https://www.kyforward.com/ket-education-and-workforce-development-cabinet-unveil-new-resource-to-aid-states-demand-for-skilled-workers/

Kincheloe, J. (1999). *How do we tell the workers: The socioeconomic foundations of work and vocational education.* Boulder, CO: Westview Press.

Klein, S., & Staklis, S. (2010). *Technical skill attainment and post-program outcomes: An analysis of Pennsylvania secondary career and technical education graduates.* Louisville, KY: National Research Center for Career and Technical Education.

KY Center for Statistics. (2019, August). *Occupational Outlook Dashboard*. Retrieved from https://kystats.ky.gov/Reports/Tableau/OOD_2019

LaFollette, A. M. (2011). *An historical policy analysis of the Carl D. Perkins legislation: Examinig the history, creation, implementation and reauthorization of the law (Doctoral Dissertation, University of Illinois at Urbana-Champaign).*

Lazerson, M., & Grubb, W. N. (1974). *American education and vocationalism: A documentary history, 1870-1970.* New York: Teacher College Press.

Lekes, N., Bragg, D., Loeb, J., C.Oleksiw, J.Marszalek, M.Brooks-LaRaviere, . . . L.Hood. (2007). *Career and technical education pathway programs, academic performance, and the transition to college and career*. Retrieved from National Research Center for Career and Technical Education: https://files.eric.ed.gov/fulltext/ED497342.pdf

Meeder, H. (2008). *The Perkins act of 2006: Connecting career and technical education with the college and career readiness agenda*. Retrieved from http://myboe.org/cognoti/content/file/resources/documents/ab/abb5de6c/abb5de6c5266b0cf5da1fe0ffde6bd5ab9ab9524/AchievePolicyBriefPerkins.pdf

Meer, J. (2007). Evidence on the returns to secondary vocational education. *Economics of Education Review, 26*, 559-573.

Nagle, J. (2001). *Voices from the margins: The stories of vocational high school students.* New York: Peter Lang.

Office of Career and Technical Education and Student Transition. (2019). Proposing legislation encouraging CTE regionalization. *CTE Partnership Forum (59)*.

Office of Education Accountability. (2019, June 18). *Kentucky District Data Profiles School Year 2018*.

Office of Standards, Assessment and Accountability. (25, September 2019). *Accountability.* Retrieved from https://education.ky.gov/AA/distsupp/Documents/Accountability%20Comparison_Working.pdf

Randall, M., & Zirkle, C. (2005). Information technology student-based certification in formal education settings: Who benefits and what is needed. *Journal of Information Technology Education, 4*, 287-306.

Rosenbaum, J. E. (2001). *Beyond college for all: Career paths for the forgotten half.* New York: Russell Sage Foundation.

Rosenbaum, J. E. (2001). Do employers need more educated youth? In J. E. Rosenbaum Eds, *Beyond College for All: Career paths for the Forgotten Half* (pp. 108-131). Russell Sage Foundation. Retrieved from http://www.jstor.org/stable/10.7758/9781610444767.

Rothman, R. (2012). A common core of readiness. *Educational Leadership, 69*, 10-15.

Sambolt, M., & Blumenthal, D. (2013). *Promoting college and career readiness: A pocket guide for state and district leaders.* Washington D.C.: American Institutes for Research.

Sims, R. (2018, August 13). *Assessment/Accountability*. Retrieved from https://education.ky.gov/AA/Pages/default.aspx

Stevenson, J. (2003). *Developing vocational expertise: principles and issues in vocational education.* Crows Nest, Australia: Allen & Unwin.

Stone III, J., & Aliaga, O. (2005). Career and technical education and school-to-work at the end of the 20th century: participation and outcomes. *Career and Technical Education Research, 20*, 125-144.

Strengthening Career and Technical Education for the 21st Century Act. (2019). Retrieved from Advance CTE: https://careertech.org/perkins

Stubbs, S., & Stubbs, J. (2017). Strategies used to enable CTE programs to be high performing in kentucky. *Research in hgiher Education Journal, 33*, 1-9.

Tamar-Belgraves, M. (2016). *Trends in career and technical education enrollment in Florida high schools, and the relation to graduation and students earning industry-recognized certifications (Order No. 10021403).* Available from ProQuest Dissertations & Theses Global. (UMI No. 1769007301). .

Taylor, M. (2019, October 2). *TRACK: Tech Ready Apprentices for Careers in Kentucky*. Retrieved from https://education.ky.gov/CTE/cter/Pages/TRACK.aspx

Threeton, M. (2007). The Carl D. Perkins career and technical education (CTE) act of 2006 and the roles and responsibilities of CTE teachers and faculty members. *Journal of Industrial Teacher Education, 44*, 66-82.

Uy, E., & Green, K. (2009). Raising the bar: technical assessments for secondary CTE programs. *Techniques: Connecting Education and Careers (J1), 84*, 22-26.

V, N. (2017, September 13). *The benefits of vocational training in high school*. Retrieved from Think Tank Learning: https://ttlearning.com/blog/benefits-vocational-training-high-school/

Whitaker, K. (2019, October 18). *CTE, accountability and transition readiness*. Retrieved from https://education.ky.gov/CTE/Pages/CTE-St-Acc.aspx

Winthrop, R., Barton, A., & McGivney, E. (2018). *Leapfrogging inequality.* Washington D.C.: Brookings Institution Press.

Workforce Intelligence Branch. (2016, June). *Kentucky Occupational Outlook*. Retrieved from https://kystats.ky.gov/Content/Reports/2014-2024%20KY%20Occupational%20Outlook.pdf

Wright, M., Washer, B., Watkins, L., & Scott, D. (2008). Have we made progress? Stakeholder perceptions of technology education in public secondary education in the United States. *Journal of Technology Education, 20*, 78-93.

Wyman, N. (2015, September 1). *Frobes*. Retrieved from Why we desperately need to bring back vocational training in schools: https://www.forbes.com/sites/nicholaswyman/2015/09/01/why-we-desperately-need-to-bring-back-vocational-training-in-schools/#78824b9287ad