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A STUDY OF THE IMPACT OF CAREER AND TECHNICAL EDUCATION IN
DETERMINING THE SKILLS GAP IN SELECTED RURAL COMMUNITIES IN
NORTH CAROLINA

By
Chad Beasley

A Dissertation Submitted to the
Gardner-Webb University School of Education
in Partial Fulfillment of the Requirements
for the Degree of Doctor of Education

Gardner-Webb University
2021

Approval Page

This dissertation was submitted by Chad Beasley under the direction of the persons listed below. It was submitted to the Gardner-Webb University School of Education and approved in partial fulfillment of the requirements for the degree of Doctor of Education at Gardner-Webb University.

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Abstract

A STUDY OF THE IMPACT OF CAREER AND TECHNICAL EDUCATION IN DETERMINING THE SKILLS GAP IN SELECTED RURAL COMMUNITIES IN NORTH CAROLINA. Beasley, Chad, 2021: Dissertation, Gardner-Webb University.

This study was an investigation of three rural high schools in western North Carolina to examine the perceptions of community employers, principals, and career and technical education (CTE) directors as to the skill levels of graduates from CTE programs. The skill levels are the skills the job market deems necessary to be successful in a particular industry. The study also determined if the skills being taught in secondary schools meet the needs of community employers. Data were collected from several sources. Qualitative data were collected via open-ended questions and one-on-one interviews with the top three industries in three select rural counties. Qualitative data were obtained from high school principals and CTE directors from selected school systems via open-ended questions and one-on-one interviews to get their perspectives on how they are meeting the needs of local employers and if they are preparing students to meet the needs of local employers. The qualitative data were used to determine the needs of local employers and to gain the perceptions of local employers as they pertain to the preparedness of new entrants into the workforce. Qualitative data were used to examine the performance of the CTE programs in three mountain counties in western North Carolina.

Keywords: skills gaps, career and technical education, essential skills, career and college ready

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Chapter 1: Introduction

The mission of career and technical education (CTE) is to help empower students for effective participation in an international economy as world-class workers and citizens. In fact, according to the North Carolina Department of Public Instruction (2018),

Hundreds of thousands of North Carolina students get their start each year in careers through secondary Career and Technical Education (CTE) courses.

Regardless of their postsecondary plans whether they be community college, university, military or directly entering the workforce, secondary CTE can be the first step in a pathway toward productive employment and citizenship. (para. 3)

Programs in CTE are designed to contribute to the broad educational achievement of students, including basic skills such as reading, writing, and mathematics, as well as their ability to work independently as a part of a team, to think creatively and solve problems, and to utilize technology (North Carolina Department of Public Instruction Accountability Services Division, 2018). Local districts use the Local Planning System (LPS) for strategic planning, managing performance, and accountability for CTE at local, state, and federal levels. The LPS has transformed from being a mechanism for approval and release of state and federal CTE funds to one for short- and long-term strategic planning, improving performance, and ensuring accountability (North Carolina Department of Public Instruction, 2019).

Through the LPS, schools can analyze measurable performance based on trend data and analyze system and subsystem performance based on relevant subcategories crucial to stakeholders and customers. School systems use predetermined rational short- and long-term benchmarks and locate like organizations affinity groups performing well

in order to benchmark them. Through the LPS, school systems will develop strategies based on the greatest opportunities for improvement and be accountable for all students (North Carolina Department of Public Instruction, 2019).

One of the primary goals of the educational system in the United States has been and still is to prepare students for employment (Greenspan, 2000). Greenspan (2000) stated, “The history of education in the United States traces a path heavily influenced by the need for a workforce with the skills required to interact productively with the evolving economic structure” (p. 419).

In the report, *No Child Left Behind: Expanding the Promise*, the major initiatives in President George W. Bush’s 2006 Education Agenda were outlined (U.S. Department of Education, 2005). The High School Initiative (U.S. Department of Education, 2005) noted that it is the goal to “ensure that every student graduates from high school with the skills to succeed in either higher education or our globally competitive workforce” (p. 4). During President Barack Obama’s address to Congress, he stated that the fastest-growing occupations required advanced skills (Obama Speech to Congress Focuses on Economy, 2009). In his speech delivered on January 21, 2015, President Obama continued to voice his support of CTE programming to develop America’s workforce in his State of the Union address (Lynch, 2015). In a White House Press Briefing released on July 31, 2018, President Trump stated that CTE programs help provide students with the skills they need to succeed in the economy of today and tomorrow (President Donald J. Trump is Committed to Preparing America’s Workers for the Jobs of Today and Tomorrow, 2018). In addition, President Trump noted he was committed to preparing America’s workers for the jobs of today and tomorrow, stating that “these programs will benefit secondary and

postsecondary students across America who utilize CTE programs to gain the skills and knowledge needed for rewarding careers” (President Donald J. Trump is Committed to Preparing America’s Workers for the Jobs of Today and Tomorrow, 2018, para. 8).

Accomplishing an administration priority, President Trump made workforce development a top priority of his administration and acted to follow through on this priority. On July 19, 2018, President Trump signed an Executive Order (Daniel, 2018) establishing the President’s National Council for the American Worker. The purpose of the council is to raise awareness of the skill gaps, help expand apprenticeships, and encourage investment in worker education. A number of major companies attended the signing and pledged to offer millions of new education and job-training opportunities for American workers. In February 2018, President Trump released an infrastructure plan that reformed and modernized federal education and workforce development programs. The Perkins CTE reauthorization was a benefit to more than 11 million students (Carl D. Perkins Career and Technical Education Act of 2006). On July 31, 2018 (Ujifusa, 2019), President Trump signed the Strengthening Career and Technical Education for the 21st Century Act into law. This bill reauthorized the Carl D. Perkins Career and Technical Education Act of 2006 and will be referred to as Perkins V (Ujifusa, 2019).

Throughout the years, it has been difficult to track both the high school dropout rate and graduation rate because there have been no standardized methods to record a student’s entrance into kindergarten and exit from high school (NGA Center for Best Practices, 2007). The percentage of students graduating from high school has been increasing and the number of dropouts decreasing for the past 40 years. Mishel and Roy (2006) found that graduation rates are exaggerated when calculated using only enrollment

and diploma data. The study also found that in the 2014-2015 school year, the adjusted cohort graduation rate for public high school students rose to 83%, the highest rate since the measure was first collected in 2010-2011. In other words, more than four of five students graduated with a regular high school diploma within 4 years of starting ninth grade. According to the National Center for Education Statistics (n.d.a), Asian/Pacific Islander students had the highest adjusted cohort graduation rate (90%), followed by White (88%), Hispanic (78%), Black (75%), and American Indian/Alaska Native (72%) students. The National Center for Education Statistics (n.d.b) defined a dropout as a “young adult, aged sixteen to twenty-four who was not enrolled in school and have not earned a high school credential with either a diploma or an equivalency credential such as a GED certificate” (para. 1).

Based on the data from the Current Population Survey (National Center for Education Statistics, n.d.a), the status dropout rate decreased from 10.9% in 2000 to 5.9% in 2015. From 2010-2015, the status dropout rate fell from 7.4% to 5.9% (National Center for Education Statistics, n.d.a). Between 2000 and 2015, the male status dropout rate declined from 12% to 6.3%, and the female status dropout rate declined from 9.9% to 5.4% (National Center for Education Statistics, n.d.a). While the rate for male youth was 2.1 percentage points higher than the rate for female youth in 2000, there was no measurable difference between the rates for males and females in 2015 (National Center for Education Statistics, n.d.a).

The status dropout rate represents the percentage of 16- to 24-year-olds who are not enrolled in school and have not earned a high school diploma or an equivalency credential such as a GED certification. Based on the data from the Current Population

Survey (National Center for Education Statistics, n.d.a), the overall status dropout rate decreased from 8.3% in 2010 to 5.1% in 2019. During this time, the Hispanic status dropout rate decreased from 16.7% to 7.7%, the Black status dropout rate decreased from 10.3% to 5.6%, and the White status dropout rate decreased from 5.3% to 4.1%. Nevertheless, in 2019, the Hispanic and Black status dropout rates remained higher than the White status dropout rate (National Center for Education Statistics, n.d.a).

In each year from 2010 to 2019, the status dropout rate for Hispanic 16- to 24-year-olds was higher than the rate for those who were Black, and the rates for both groups were higher than for those who were White. In 2019, the status dropout rate was higher for male 16- to 24-year-olds than for female 16- to 24-year-olds overall (6% vs. 4.2%); status dropout rates were higher for males than for females among those who were Hispanic (9.3% vs. 6%), Black (6.8% vs. 4.3%), of Two or More Races (6.2% vs. 4.1%), and White (4.7% vs. 3.5%). There were no measurable differences in status dropout rates between males and females for those who were Asian, Pacific Islander, or American Indian/Alaska Native (National Center for Education Statistics, n.d.a).

According to the U.S. Department of Education (2019), 8 years after their expected graduation date, students who focused on CTE courses while in high school had higher median annual earnings than students who did not focus on CTE. Also, high school students who were CTE concentrators were employed full-time at higher rates 8 years after their high school graduation compared to non-concentrators (72% compared to 67%), which results in an almost 17% increase in annual earnings (U.S. Department of Education, 2019).

According to Friedman (2005), the United States is suffering from a shortage of

workers with both academic and technical skills. Given that dropouts are not getting the academic and technical skills they need to be successful in the U.S. workforce, U.S. employers are outsourcing jobs to other countries or employing skilled international workers to meet the U.S. workforce need. In 2003, Jobs for the Future released a report indicating that the educational system must radically change how we educate low-income and minority students if the United States is going to meet the needs of providing 12 million highly skilled workers by 2020 (Steinberg et al., 2003).

CTE, formerly known as vocational education, provides students with that connection between theory and application. CTE is a critical component of the educational system in that it provides students with the opportunity to learn what is needed to get and keep a job; receive information about careers; have opportunities to experience careers in which they have an interest; and make informed decisions about their next steps after high school, be it further education or direct entry into the workforce. Currently, CTE courses are offered throughout the United States in high schools, career and technical schools, career centers, and a multitude of postsecondary programs and facilities (Brand et al., 2013).

Research suggests that CTE, integrated with academic learning, has a positive impact on keeping students in school. Courses that integrate academics with CTE make the subject matter relevant and help students apply skills learned in the workplace setting (Brand et al., 2013). According to the U.S Department of Education, each high school CTE course a high school student completes results in an almost 2% increase in annual earnings (Silverberg et al., 2002).

Research validates that student enrollment in CTE courses can positively impact

dropout rates, prepare students for the job market needs of the future, and increase the future earning potential of students. However, the success CTE programs can achieve is challenged by one major barrier to student participation in CTE; that is, the benefits of such programs are not realized by many educators, students, and parents (Association for Career and Technical Education [ACTE], 2007). According to Wonacott (2002), negative perceptions associated with earlier vocational education programs persist. Wonacott stated that in the past, it was widely thought that vocational education was for students not planning to go to college, for special needs students, or for students at risk of dropping out. Perceptions that CTE is only for high-risk or special needs students began with the federal legislation that created CTE programs and by the students who took and completed CTE programs (Jacob, 2017).

Background

Research conducted by the National Research Center concluded that the perception of CTE needs to change (Lewis, 2001). Many people feel that CTE offers an inferior curriculum and that students who cannot meet college entrance requirements need to enroll in CTE courses. Efforts have been made to change the perception of CTE, such as changing the name from vocational education (Lewis, 2001).

There is limited research on the profile of a student enrolled in CTE programs. Understanding the profile of high school students enrolling in CTE programs during their regular school day regarding their academic standing and socioeconomic status will assist educators in understanding why students choose to participate. This information will assist educators in developing strategies to reach out to all students to enroll in CTE programs. Researchers (Bowden, 1998; Kerka, 2000; Langland, 1999; Ries, 1997) have

found that students of different levels of academic standing participate in CTE. Levesque and Hudson (2003) found the students in high academic achievement groups were less likely to be in a CTE concentration. Gaunt (2005) found that grades of non-CTE students were approximately one grade classification higher than that of CTE students.

As in past studies (e.g., Levesque et al., 2008), students who started high school at lower academic achievement levels were found to participate in CTE at higher levels than those who started at higher academic achievement levels. Focusing on assessment scores, a negative relationship between initial academic achievement and CTE course taking was also found in most CTE subject areas (National Center for Education Statistics, 2021).

Arbeit et al. (2017) found 79% of high school graduates earned at least one credit in CTE; however, among graduates who scored at different levels on the Grade 9 mathematics assessment, no significant differences were found for credits earned in engineering, design, or healthcare. Graduates whose assessment scores were in the highest 25% earned more credits in computer and information sciences (Ingels et al., (2007).

The value of a student's high school experience can be supported through involvement in CTE. The Carl D. Perkins Vocational and Technical Education Act was first authorized by the federal government in 1984 and reauthorized in 1998 and again in 2006 (Enzi, 2006). The act (Enzi, 2006) aimed to increase the quality of technical education within the United States to help the economy. On August 12, 2006, President George W. Bush signed into law the reauthorization of the act of 1998 (Enzi, 2006). The law, the Carl D. Perkins CTE Improvement Act of 2006 (Enzi, 2006), was passed almost unanimously and included three major areas of revision. Those revisions included using

the term CTE instead of vocational education (Enzi, 2006), maintaining the Tech Prep program as a separate federal funding stream within the legislation, and maintaining state administrative funding at 5% of a state's allocation. The law also included new requirements for "programs of study" that linked academic and technical content across secondary and postsecondary education and strengthened local accountability provisions that will ensure continuous program improvement.

Research has documented that a skills gap exists between new entrance into the workforce and the qualifications that are required of existing positions. Studies have also shown that students who enroll in CTE courses are more likely to graduate from high school, acquire employability skills, and increase their learning potential. What makes the study important is the fact that while CTE classes are popular, only 25% of students take courses that would lead to the nation's biggest industries (Stringer, 2019).

One of the expectations of our educational system is to prepare students for employment, yet approximately 20% of high school students in the United States do not graduate from high school (Mishel & Roy, 2006). By the end of the first decade of the 21st century, there were signs that the U.S. was failing to meet its obligation to prepare millions of young adults. Education has never been more important to economic success, and the U.S. has fallen behind many nations in educational attainment and achievement. Within the U.S. economy, there is also growing evidence of a skills gap in which many young adults lack the skills and work ethic needed for many jobs.

Research of the literature has documented that a skills gap exists between new entrance into the workforce and the qualifications that are required of existing positions. The Organisation for Economic Co-operation and Development (OECD, 2013) published

OECD Skills Outlook in 2013: First Results from the Survey of Adult Skills. The results showed that the United States has fallen behind other nations. The results showed that poor skills severely limit people's access to more rewarding and productive jobs. The distribution of skills has significant implications for how the benefits of economic growth are shared within society. If a large number of adults have poor skills, it becomes difficult to introduce productivity-enhancing technology and new ways of working. Fewer than 12% of the 5,000 assessed Americans scored in the top two levels of the literacy test. The United States was about average in terms of problem-solving with computers. The biggest deficits for the United States were in math (OECD, 2013). The selection process of the participants involved was not disclosed, which could have a positive or negative impact on the results of the study.

Is Perkins a Good Investment?

The graduation rate for students who take a concentration of CTE courses is about 93%, approximately 10% higher than the national average (Perkins Data Explorer, Program Year 2016-2017, n.d.). The estimated impact of achieving a 90% graduation rate nationwide, calculated for the class of 2015, is a \$5.7 billion increase in economic growth and \$664 million in additional federal, state, and local taxes (Alliance for Excellent Education, 2017). CTE is a proven strategy to strengthen the U.S. economy as it engages learners, strengthens the workforce, and closes the critical skills gap. Forty-six percent of employers have difficulty finding skilled talent, costing an estimated \$14,000 to businesses per job that goes unfilled (Manpower Group, 2013).

Problem Statement

One of the expectations of the educational system is to prepare students for

employment, yet according to the National Center for Education Statistics (n.d.b), approximately 17% of high school students in the United States do not graduate from high school. Studies have shown that students who enroll in CTE courses are more likely to graduate from high school, acquire employability skills, and increase their earning potential (Jacob, 2017). In 1980, only 84% of adults between the ages of 18 and 24 had graduated from high school. In 2019, the national graduation rate was 84.6%. The graduation rate has increased since World War II (1945) when graduation/completion rates were closer to 50%. In 2018, 93% of adults between the ages of 18 and 24 and 89.8% of adults over the age of 25 had completed a diploma, GED, or another equivalency credential (Hanson, 2021).

Hiring trends in the last year will dictate where opportunities are in 2021, and job seekers must look at ongoing patterns to position themselves for a new role. LinkedIn News Senior Editor Andrew Seaman (2021) stated, “The data shows that in the next five years, we’ll see 150 million more technology-related jobs across industries globally, so demand for digital skill is very much on the rise” (para. 14).

CTE courses focus on improving the academic and technical achievement of CTE students, strengthening the connections between secondary and postsecondary education, and improving student college and career preparedness; however, despite the amount of extensive research that has been conducted to support this focus, few academic studies address the effects participation in CTE courses has had on overall academic achievement. In addition, little research has been conducted to analyze the impact of participation and completion of CTE courses on student levels of efficacy, self-worth, development of identity, and student perception or “liking” of school (Cohen &

Besharov, 2002).

By 2017, an estimated 2.5 million new middle-skill jobs were expected to be added to the workforce, accounting for nearly 40% of all job growth according to an analysis of local data from Economic Modeling Specialists International and CareerBuilder (Gerrain, 2016; Webster, 2014). These jobs require some training but far less than a bachelor's degree. Technology has given many a makeover, leaving them worlds away from their assembly-line predecessors and challenging the notion that good blue-collar jobs are dead and that the only path to a good career is a 4-year degree (Gerrain, 2016).

In most metro areas, some of the highest paying middle-skill jobs earn an average income of more than \$70,000 per year (U.S. Department of Labor: Bureau of Labor Statistics, 2018). Although manufacturing jobs have declined 35% since 1980, according to the U.S. Department of Labor: Bureau of Labor Statistics (2014), there has been a resurgence in recent years as American companies have found that moving jobs offshore did not work for products requiring highly skilled labor.

Mike Rowe host of the television show *Dirty Jobs* worries there are too many young people going to 4-year colleges, racking up huge amounts of debt, and ultimately ending up unemployed, when they could have taken a less-expensive path and ended up with a good-paying job (Gerrain, 2016). “‘What’s aspirational about “middle skill”?’ says Rowe, ‘It’s going to take a generation to get people to really challenge the stereotypes that come along with skilled-labor type jobs’” (Webster, 2014, para. 30). Nationally and within North Carolina, there is a sense of urgency to address the difficulties some employers have finding qualified workers (North Carolina Department of Commerce,

2014). Even with high numbers of unemployed individuals as a legacy of the recession, some employers claim it is difficult to find qualified employees to fill vacant positions in a variety of industries and occupations. Employers report that the North Carolina labor pool is not matching the growing demand for jobs that require strong skills, both “hard skills” and “soft skills,” proper training and certification, sufficient levels of education, and previous work experience (North Carolina Commission on Workforce Development, 2014).

During the fall of 2019, the North Carolina Department of Commerce asked over 2,000 business establishments about their hiring practices, with emphasis on hiring difficulties and workforce needs. Respondents came from all 100 of the state’s counties. The industry mix and firm size of the overall sample are reflective of the state. Over half of the employers trying to hire in the past 12 months reported affirmatively that they had difficulty (North Carolina Department of Commerce, 2020).

Employers with hiring difficulties were asked to select reasons for difficulty from a list of potential explanations. The following list shows responses from the overall sample: lack of employability qualities, lack of work experience, lack of soft skills, lack of technical skills, and lack of educational credentials (North Carolina Department of Commerce, 2020).

Today, as never before, Americans look to our nation’s businesses and industries to create innovative strategies for providing jobs and bolstering American competitiveness in the global marketplace (CORD, n.d.). To fulfill that task, business and industry must have access to an abundant pool of well-qualified workers which, in turn, requires that our public school system produce graduates who are ready for the

challenges of college and the workplace. Despite the efforts of countless dedicated teachers and administrators, American public education continues to fall short of its potential. Yesterday's educational system is inadequate to meet today's realities (Center for Occupational Research and Development, n.d.). Our current education system is built on the Industrial Revolution model and focuses on IQ; in particular, memorization and standardization. We must update education with job readiness and the ability to compete against smart machines and the creation of long-term economic value in mind (Krishnan (2020). We need to fix the bridge from education to employability. Sixty percent of future jobs have not been developed yet, and 40% of nursery-age children in schools today will need to be self-employed to have any form of income. What students need to learn, how students learn, and the role of the teacher are all changing (Leopold et al., n.d.).

Career pathways offer a number of benefits to educators, students, employers, and society in general (Stone, 2002). Career pathways show students how academic concepts are used outside the classroom. They motivate students and give them a desire to stay in school. Every career pathway leads the student toward personal and professional goals while providing flexibility to change at any time. Pathways are academically rigorous and integrate STEM subjects with language arts, social studies, history, and other academic subjects in the context of the world of work. Career pathways take into consideration the variety of student learning styles (U.S. Department of Education, 2017).

According to the Bureau of Labor Statistics Occupational Outlook Handbook (U.S. Department of Labor: Bureau of Labor Statistics, 2018), many of the fastest-growing jobs through 2022 will be in CTE fields, including healthcare, the skilled trades,

STEM, IT, and marketing. Many of the highest-paid jobs are also in fields for which CTE prepares students, including healthcare, STEM, architecture, IT, and marketing (U.S. Department of Labor: Bureau of Labor Statistics, 2014). According to research from Georgetown University Center on Education and the Workforce (Carnevale et al., 2013), the U.S. will need at least 4.7 million workers with postsecondary certificates. Of the 55 million job openings projected through 2020, 30% will require some college or a 2-year associate degree, although this will vary by occupation (Carnevale et al., 2013).

Despite the amount of research that has been conducted, few academic studies address the effects that participation in CTE courses has had on academic achievement, levels of efficacy, self-worth, and low levels of identification with and liking of school.

CTE works for high school students. The average high school graduation rate for students concentrating in CTE programs is 90.18%, compared to an average national freshmen graduation rate of 74.9% (Owen & Hierholzer, 2017). High school students involved in CTE are more engaged, perform better, and graduate at higher rates. When surveyed, 81% of dropouts (Auger, 2015) say relevant, real-world learning opportunities would have kept them in high school. CTE works for businesses and addresses the needs of high-growth industries and helps close the skills gap. The skilled trades are the hardest jobs to fill in the United States, with recent data citing 806,000 jobs are open in the trade, transportation, and utilities sector and 293,000 jobs are open in manufacturing. STEM occupations will experience faster than average growth (ACTE, 2019). CTE course completion benefits not only the students who enroll but also the national economy (Jacob, 2017).

America faces a shortage of available workers. To be globally competitive, the

United States must increase the number of high school graduates who are skilled due to the increasing demand for these jobs. This is especially important as the workforce is entering a period of realignment due to the retirement of the baby boomer generation (Barrington et al., 2006).

The concern with a workforce skills shortage is something that is worrying businesses all over the world. Companies that are not able to fill positions with skilled workers will be left with stretched resources that result in damaging implications for the short- and long-term outlook of the business. Some 83% of businesses are struggling to find workers with the right skillsets, according to the Society for Human Resource Management (Burner et al., 2019). The economic benefits of education are well known, as any education above a high school diploma boosts a worker's likelihood of being employed, their earnings, and the economy as a whole (Burner et al., 2019).

Seven million jobs were open in December 2018, but only 6.3 million people were looking for work. Business and human resource (HR) leaders view the skills shortage as a top concern that needs to be addressed. Among HR professionals, 75% of those having recruiting difficulty say there is a shortage of skills in candidates for job openings. Filling those jobs will require worker training, education, and closely collaborating with educational institutions to improve graduate employability (Burner et al., 2019).

A strong CTE curriculum that is current and relevant to the needs of our students and a changing economy is a solution to this problem. Development of Pathways to Prosperity will continue to be a major CTE thrust in the future. Partnerships with local businesses/industry and community colleges are essential. A focus on high educational

expectations in CTE, support of expanding student credentialing, and WorkKeys opportunities will help develop student preparedness for the demands of high-skill and high-wage jobs (Brand et al., 2013).

The field of CTE has worked hard to establish an image as a program for all students who intend to enter the world of work or continue their education beyond high school. The Pathway to Prosperity, Career and College Promise, Career Clusters, Future Ready Core, CTE Essential Standards, and high school accountability have made CTE as important as the academic areas in preparing students for life beyond high school (Brand et al., 2013).

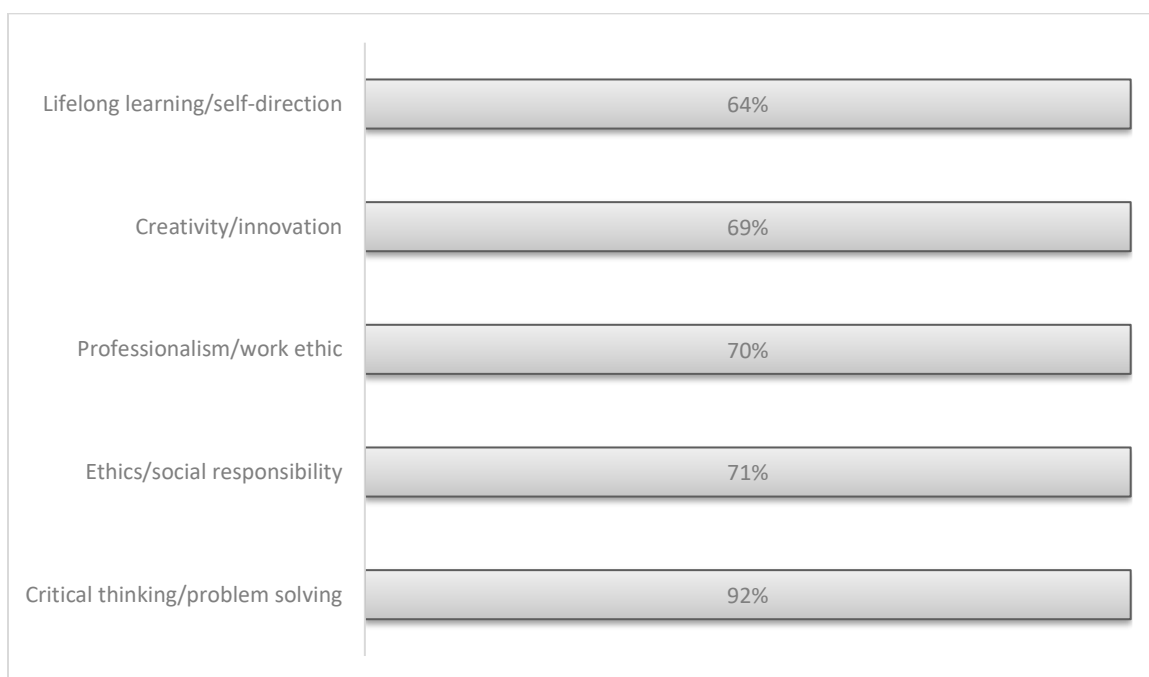
The strength of any LPS is to continually evaluate, assess, and create strategies for improvement. The LPS for CTE continues to be a work-in-progress system. Strengths associated with CTE programs are the highly qualified teachers who are preparing students to contribute economically. CTE offers many employment opportunities for students as well as credential opportunities in the classroom. Teachers increase engagement and retention in the classroom with problem-solving activities, collaboration, and strong community interaction. All these strengths have led to higher CTE graduation rates in the state of North Carolina. The CTE local plan specifically targets local, regional, and state economies and preparing students to enter the 21st century prepared to work (Brand et al., 2013).

In 2009, the Ill-Prepared U.S. Workforce report was released (Barrington et al., 2006). The data for the report were obtained by surveying 217 employers to examine corporate practices on training newly hired graduates at the high school level, the 2-year college level, and the 4-year college level. Of the companies surveyed, almost half

provided remedial training programs to erase deficiencies among newly hired entrants in skills they are expected to have when hired; however, many of the companies found that these remedial programs failed to fully accomplish their purpose (Barrington et al., 2006). Figure 1 illustrates the percentage of employers who believed that additional training was needed in the perceived high need areas. Furthermore, the study examined the perceptions of new entrants to the workforce and employers as to the skill levels needed to be successful in the 21st century industry.

Figure 1

“High Need”



Note. Graph gives percentages of high need areas for training (Barrington et al., 2006).

Purpose of the Study

The purpose of the study was to determine the impact of participation in CTE in determining the skills gap in selected rural communities. The study also examined the effectiveness of the CTE program in three mountain counties in western North Carolina.

The study examined CTE's role in keeping students in school and closing the skills gap. Research has shown that students who complete a CTE program are likely to complete high school (Bishop & Mane, 2003). CTE is an effective method of dropout prevention and is credited with keeping a number of at-risk students in school.

Research Questions

It was the intent of the study to answer the following questions, which will enhance curriculum and program development of CTE programs.

1. What effect does participation in CTE classes have on students and their ability to be career and college ready?
2. Based on the perception of local employers, how well did the CTE programs of three mountain counties of western North Carolina prepare students for job and career readiness?
3. What is the overall effectiveness of the CTE experience in the school districts of three mountain counties of western North Carolina?

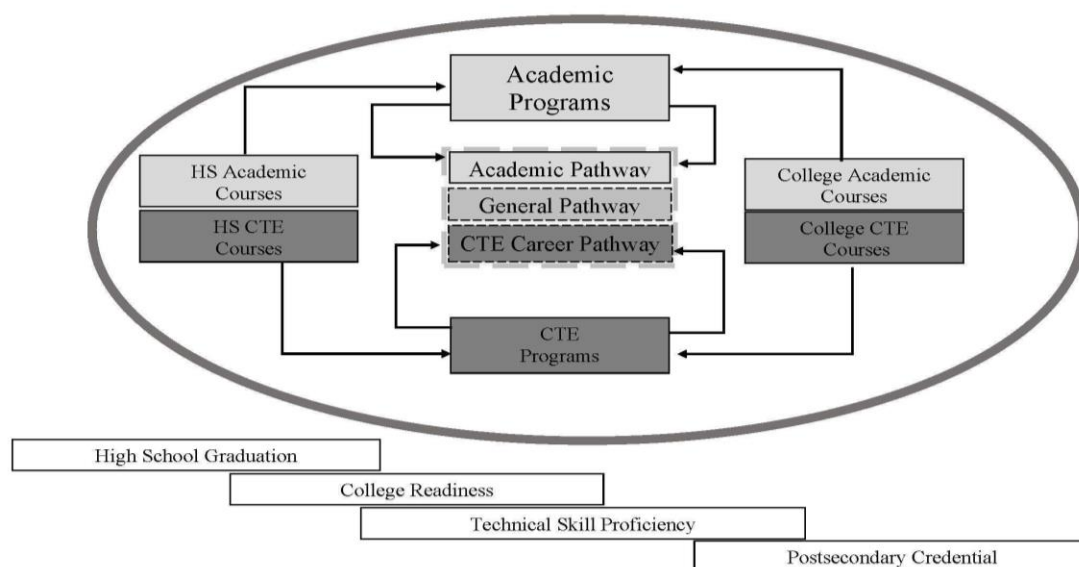
Conceptual Framework for the Study

Four things must be taken into consideration to develop a conceptual framework for CTE research. First, develop a precise definition of who a CTE student is, and that definition should clearly indicate the boundaries of their experiences. Second, develop a standardized data system that will keep track of a CTE student's educational progress across defined career pathways that span Grades 9-14. Third, measures must be constructed precisely to indicate the level of success at different stop-out points CTE students encounter along the way. Last, the back-and-forth transitions between education and employment of many CTE students must be clearly considered. Taking these four

elements into consideration, valid and reliable student success measures would be covered from high school graduation through college readiness. Technical skill proficiencies and postsecondary credentials with employment success and wage earnings in a self-determined career pathway are also measures of student success (Kotamraju, 2007).

Figure 2

CTE Conceptual Framework



Definition of Terms

The following terms are used in the study.

CTE

A term applied to schools, institutions, and educational programs that specialize in the skilled trades, applied sciences, modern technologies, and career preparation (Glossary of Education Reform, 2019).

21st Century Skills

Skills that are relevant to all academic subject areas and that can be applied in educational, career, and civic contexts throughout a student's life (Glossary of Education Reform, 2016).

Career and College Ready

A high school graduate who has the English and math knowledge and skills needed to qualify for and succeed in postsecondary job training and/or education necessary for their chosen career (i.e., community college, university, technical/vocational program, apprenticeship, or significant on-the-job training; Achieve, Inc., 2017).

Student Achievement

The achievement of a student within an academic setting, as measured by weighted and unweighted GPA calculations (National Board for Professional Teaching Standards, 2019).

Ethnicity

A person's ethnic affiliation based on No Child Left Behind designation: White, Black, Hispanic, and Other (New Race and Ethnicity Guidance for the Collection of Federal Education Data, 2010).

Future Ready Core

The course of study in which students engage during their high school career (Pitre-Martin & Brown, 2011).

Career Cluster

A framework that provides a vital structure for organizing and delivering quality

CTE programs through learning and comprehensive programs of study (Career Clusters, 2018).

Credentials

Testimonials or certified documents showing that a person is entitled to credit or has a right to exercise official power (Merriam-Webster, n.d.)

Statement of Assumption

This study used a qualitative research approach. In collecting and analyzing data sources, an assumption is made that participants will answer interview questions accurately and honestly. This is significant as one focus of the study is identifying if CTE course enrollment enhances student overall perception, engagement, or “liking” of school. The study focused on a rural region of western North Carolina. The study assumed that the results would apply to other rural school systems outside this region and state. This is important as findings could be beneficial to other regions and states that seek to improve their CTE programming.

Additional assumptions of the study revolved around existing beliefs and common misperceptions of CTE programming. One such assumption of the study was that students, parents, and even educators may lack an understanding of the importance and benefit of CTE as well as many misconceptions as to student placement in CTE courses. As efforts are made to educate the adults responsible for informing high school students of their options and opportunities, there is also a need to inform high school students and their parents directly about CTE to alleviate misconceptions regarding CTE.

Another assumption of the study was that not all stakeholders view CTE as a viable option to prepare students for college and career readiness. Workforce skills and

demands have changed dramatically in the past 40 years. Our system of education was built for an economy that no longer exists. A vision for education will inevitably draw upon the issue of workforce and career preparedness in a digital economy (Kay & Greenhill, 2012). Today's learners are digital natives. As educators, we need to embrace the power of technology and make learning relevant for all students. Using technology thoughtfully will allow us to stretch student thinking in ways that will lead to success in our increasingly global economy (Daggett, 2015). In 2014, 40% of employers reported difficulty in filling job openings even though approximately 13 million people are unemployed at any one time (Manpower Group, 2013). Employers say they cannot find people with the necessary skills to fill these positions. A U.S. Department of Education report found higher unemployment among college graduates who majored in general majors in liberal arts or humanities compared to those who majored in technical fields aligned with occupations like healthcare or education (Staklis & Skomsvold, 2014). Forty-eight percent of employed recent 4-year college graduates are holding jobs that require less than a 4-year degree (Bidwell, 2013).

An additional assumption of the study was that there is resistance to the acceptance and promotion of CTE as an integral aspect of our educational system. Perhaps one of the most urgent issues in education today is creating an educational system that is designed to prepare our students for their future rather than designed to meet the needs of the educators' past. The biggest challenge is not changing the student but shifting the attitudes of the adult decision makers. The language that is used by adults to describe CTE courses and programs often continues to perpetuate the perception that CTE courses are for non-college-bound potential dropouts or other students with special

needs. These influences have a negative impact on high school student perceptions of CTE.

Preparing our teachers to deliver rigorous and relevant academics that will prepare students for college and career will require focused and sustained professional development, plus a number of fundamental shifts in how we organize the instructional programs in our schools. It will also require a shift in our collective mindset from protecting the existing system toward fighting for the interest of our students (Daggett, 2015).

Scope and Delimitations

The literature indicates there is a need to understand the demographic profile of high school students enrolled in CTE courses as well as the factors that influence their decisions to enroll. In addition, presenting the advantages of enrolling in CTE courses will assist in educating people about CTE. The study focused on rural high school students, Grades 9-12, enrolled in CTE courses.

The study was a comparison of CTE and non-CTE students enrolled in rural public schools in North Carolina. One of the specific problems with the study was the lack of knowledge regarding the impact CTE has on graduation rates and a student's potential participation in employment or secondary education after graduation. High schools that combine the essentials of a college preparatory academic core with CTE studies and opportunities to use math, reading, and science knowledge can improve student motivation to stay in school and graduate.

Limitations

A variety of forces directly or indirectly affect CTE, ranging from the persisting

stigma or negative image of CTE, the school's curricular structure and requirements, and federal laws such as the Perkins Act. State and federal laws guide administrator decisions at the local level that affect CTE. Goals have been set for all students to improve academic achievement, reach high standards, and graduate from high school. With an increased emphasis on academic rigor and progress on student state assessments, holding schools accountable to annual yearly improvement has put an increased emphasis on core academics that may in turn reduce or eliminate effective CTE programs.

The spread of COVID-19 sent shockwaves across the globe. While the long-term impact of the crisis is uncertain, the pandemic may affect public spending on education, as funds are diverted into the health sector and the economy. The lockdowns in response to COVID-19 interrupted conventional schooling. CTE has been hit hard by the crisis. CTE programs suffered a double disadvantage as social distancing requirements were put into place and businesses began to close. These disadvantages limited the learning that is so crucial for the success of CTE and have made things difficult or impossible for student success (Schleicher, 2020).

The findings from the study are grounded in small rural counties in North Carolina. The study specifically focused on students who participated in CTE courses, with a broader focus on CTE concentrators. It should be noted that the findings from a small study of this nature cannot be generalized to other larger districts.

The results of the study have the potential to generate improvements on how local school districts develop their CTE programs in the future, despite funding limitations. It is anticipated from these results that future explorations on improving CTE opportunities for students and their ability to be career and college ready will help in student

motivation and greater achievement on state-mandated tests.

Significance

The significance of the study was to explore the idea that CTE is an underutilized learning pathway that could help to increase the educational engagement, achievement, and attainment of students who are not excelling in more traditional academic programs (Glossary of Education Reform, 2016). The practical learning experiences that are often provided in career and technical programs appeal to many students and certain common elements (e.g., the focus on critical thinking, new technologies, real-world strategies, hands-on activities, and the application of learning to solve practical problems) align with a growing emphasis on 21st century skills. Twenty-first century skills are relevant to all academic subject areas and can be applied in educational, career, and civic contexts throughout a student's life (Glossary of Education Reform, 2019). Such a finding would indicate that participation in CTE could be used in schools as a means for closing the skills gap for all participants, irrespective of gender or ethnicity, and enlighten school district superintendents, high school administrators, CTE directors, local boards of education, and policy makers at the state level.

Summary

Participation in CTE affords many positive outcomes in the academic setting. Student participation in CTE helps to create positive school connections through increased student engagement inside and outside the classroom. A body of research associates CTE participation with heightened academic achievement through the building of practical learning experiences such as a focus on critical thinking, new technologies, real-world settings, hands-on activities, and the application of learning to solve practical

problems. Perhaps most fundamentally, we need to change our attitude about CTE and work to remove the stigma associated with an education that is not part of a 4-year college degree. CTE programs are rigorous, demanding, and relevant to regional employers and the labor market as a whole. They prepare youth and adults for a wide range of high-wage, high-skill, and high-demand careers.

The study is organized into five chapters. Chapter 1 introduced the reader to the research study and included background information, the statement of the problem, and the research questions to be answered. Chapter 1 also included the purpose of the study, limitations, assumptions, and definition of terms. Chapter 2 presents a comprehensive review of the literature related to CTE. Chapter 3 explains the design of the study, the instrumentation utilized, the selection of respondents, data collection procedures, and the data analysis techniques. Chapter 4 presents the findings of the study. Finally, Chapter 5 gives an analysis of the major findings of the study, provides specific conclusions, and offers recommendations for further study.

Chapter 2: Literature Review

Overview

In organizing a critical analysis of the literature that defines CTE and its impact on student achievement, it is important to understand the diverse facets of CTE. For students to feel successful and enjoy involvement, the classes must be based on student interest with a career preparation; therefore, for high schools to have a positive impact on students with their involvement in CTE, they should listen to the student's voice. "It is not enough for schools to provide resources: instead, they ought to also offer activities that match student interest and encourage students to participate in those activities" (Stearns & Glennie, 2010, para. 6).

The following four primary groups that are a part of the study define CTE involvement: (a) CTE, (b) career and college ready, (c) CTE concentrators, and (d) motivation. These represent areas within the high school CTE setting that typically provide avenues for student achievement. It is important to understand these groups and to define the potential benefits of participation in CTE. The literature review for the study addresses the following areas: CTE, career and college readiness, CTE participation and student achievement, concentrators, and participation in employment or secondary education.

Several studies have shown how CTE programs benefit high school students. Schargel and Smink (2001) identified five potential benefits for students who take CTE courses:

- Enhancement of student motivational and academic achievement,
- Increased personal and social competence related to work in general,

- A broad understanding of an occupation or industry,
- Career exploration and planning, and
- Acquisition of knowledge or skills related to employment in particular occupations or more generic work competencies.

Throughout history, reform efforts have focused on solving society's ill by reducing economic, class, and racial inequalities. The vehicle for this reform has been the educational system; and for many years, people in the United States have expected that education plays a key role in helping the poor improve their lives. This was also a belief of Thomas Jefferson, who believed that education is the instrument that can improve the condition of man (Friedman, 2005; Oakes, 2005).

A recent survey from Rethink Ed in 2019 of students, parents, and employers found that real-world skills are more important than ever (Scheidegger, 2019). The survey illuminated that there is a broad recognition that American high schools are not doing enough to prepare students for success outside of academic settings. Employers, even white-collar employers, responded that they would hire someone without a college degree if they had the experience. Experience stood out as the most important factor in hiring decisions, with employers rating it more important than success with subject matter.

Many recognize the world of work is changing. Of those surveyed, roughly one in five adults (18%) believed their job will not exist in 20 years; and over a quarter (26%) of high school students believed the job they will hold in 20 years has not even been invented yet. High school students are perceived as being less prepared to join the workforce than their parents' or grandparents' generations. Seventy percent of adults

surveyed said graduates in the 1950s and 1980s were prepared to succeed in the workforce, but less than half of adults (49%) believe that students graduating high school today are even somewhat prepared to succeed. When asked for open answers, real-world exposure was important to parents, students, and employers, with a greater influence on internships, entrepreneurial skills, and financial literacy for workforce competitiveness.

Students recognized the importance of technology skills needed for the future, as survey participants focused on highly technical industries like computer science, healthcare, and engineering as the fastest growing industries. Employers are putting a higher emphasis on skills that only humans can provide, like creativity and perseverance. It will be essential for the growth and development of a new generation of change-makers to cultivate a culture within schools to foster employability skills, getting students in real-world learning opportunities, and providing new insights and information on how to navigate the future.

CTE

When the Carl D. Perkins Act was reauthorized in 1990, known as Perkins II, the National Center for Education Statistics (2003) defined vocational education as “organized educational programs offering a sequence of courses which are directly related to the preparation of individuals in paid or unpaid employment in current or emerging occupations requiring other than a baccalaureate or advanced degree” (p. 2). Perkins II required integrated academics in CTE curriculum and work-based learning experiences (Stone, 2002). Integrating academics into the CTE curriculum was a shift back from when the focus shifted to academics and college prep in response to *A Nation at Risk*.

In 1998, the Carl D. Perkins Act was again reauthorized, known as Perkins III (Enzi, 2006). The act eliminated special populations; integrated academics; emphasized industries and careers in place of entry-level, job-specific training; and strengthened ties with postsecondary institutions (U.S. Department of Education, 2002, p. 4). In 1998, the Vocational Education Association changed its name to ACTE (2006). Perkins III, along with Workforce Investment Act, refocused the need to align CTE programs with workforce investment activities that increase employment, retention, and earnings; thereby improving the quality of the workforce.

In 2002, the No Child Left Behind Act was signed into law by President George W. Bush (Gordon, 2008). This act reauthorized the Elementary and Secondary Education Act of 1965 and put into motion the most comprehensive reform effort in education in years (Gordon, 2008).

In 2006, the Carl D. Perkins Act was again reauthorized and is known as Perkins IV. Vocational education was changed to CTE; 8 years after, the Vocational Education Association changed its name to CTE. In 2006, CTE programs looked different; therefore, the name change. The Perkins Act provides for secondary and postsecondary partnerships with business and industry, industry assessments, credentialing of students, and placement of students after graduation (Gordon, 2008). Perkins IV eliminated the restriction that CTE programs could not prepare students for a baccalaureate degree (Gordon, 2008).

There appears to be a different trend occurring in CTE: More students are taking CTE courses to explore different career options than identifying one and concentrating in this area. Concentrating was less common in 2005 (58.3%) than it was in 1982 (72.8%)

(Silverberg et al., 2004). Is this because the objective for enrolling in CTE courses has changed? According to the U.S. Department of Education, there are a variety of other reasons students enroll in CTE courses (DeLuca et al., 2006). These include (a) to gain exposure, (b) to help them select or prepare for a college major, (c) to use a fallback if college or other career plans fail to materialize, (d) to pursue a leisure interest, and (e) to take classes that present less of an intellectual challenge than others.

Bill Gates stated, “If the United States truly wants to secure its global leadership in technology innovation, we must commit to a strategy for innovation excellence...so that America’s students have the skills to succeed in the technology- and information-driven economy” (Pyka, 2016, para. 1).

CTE works for high school students. A ratio of one CTE class for every two academic classes minimizes the risk of students dropping out of high school (Plank et al., 2005). CTE students are significantly more likely than their non-CTE counterparts to report developing problem-solving, project completion, research, math, college application, work-related, communication, time management, and critical-thinking skills during high school. The Society for Human Resource Management has identified employer demand for many of these skills (ACTE, 2018). CTE research has also found that work-based learning helps students apply and extend classroom learning, gain motivation and understanding, explore careers, and develop a critical understanding of the work environment (Alfeld et al., 2013); however, despite this research, policies do not mandate participation in these courses as they do academic courses, and students are not equitably encouraged to enroll in these courses as part of their high school course of study.

Concentrators

CTE programs are organized into 16 career clusters or similar occupational groupings that identify the knowledge and skills students need as they follow a pathway to their goals (North Carolina Career and Technical Education, 2017). Once students choose the pathway they want to follow, the career-specific instruction they receive can lead to a high school diploma, an industry-recognized credential, a certificate, or a college degree. The career clusters framework serves as an instructional and guidance model that provides students with a seamless transition from high school to postsecondary and work opportunities. Under student definitions of the Carl D. Perkins Career and Technical Education Act of 2006 (Gordon, 2008; Perkins Collaborative Resource Network, n.d.), a CTE concentrator is a secondary student who has earned three or more credits in a single CTE program area or two credits in a single area but only in those programs where two credit sequences at the secondary level are recognized by the state and/or its local eligible recipients.

For students in North Carolina, a concentrator is a student who has earned four or more technical credits in a career cluster, at least one of which is a completer course. The student may earn all four credits from foundation courses or three from foundation courses and one from enhancement courses for the career cluster. H.R. 5587's (ACTE & National Alliance for Partnerships in Equity, n.d.) proposed definition for secondary "CTE concentrator" raises concerns around the appropriateness of the definition for performance measures, as well as comparability with research and current federal and state data systems. CTE student populations, as defined in the research, are secondary CTE students currently classified in the research literature by the number and type of

courses in which they enroll. The most common classification scheme includes the following categories: non-investors (nonparticipant, fewer than one occupational credit earned; and sampler, one to fewer than three occupational credits earned) and investors (explorer, three or more occupational credits but no single occupational area with three or more credits; and concentrator, three or more occupational credits in one area).

The latest trend data from the National Center for Education Statistics show that in 2009, 19.1% of all high school graduates had earned three credits in a single occupational area and 35.5% of all high school graduates had earned three credits in any occupational area (including those earning three credits in a single area and across multiple areas). While these definitions have not appeared in a statute in the past, states have used variations of the secondary CTE concentrator definition above to determine the population of students to whom to apply the law's accountability measures.

The current definition incorporates two very distinct populations—those exploring various career opportunities, “explorers,” and others who are invested in a single career pathway, “concentrators”—which undermines the law's ability to measure a common student population. Congress desires to renew Perkins to improve the educational and labor market outcomes of CTE students; however, including explorers as part of the concentrator definition significantly limits the ability to evaluate and assess the impact of CTE programs on these outcomes. The shift in focus away from actual CTE concentrators will undermine stakeholder abilities to build coherent pathways and meet employer needs by reducing the focus and importance of this population, setting back current improvement efforts that use a sequence of rigorous CTE courses as a framework for CTE delivery.

The average high school graduation rate in 2012 for CTE concentrators was 93%, compared to the national adjusted cohort graduation rate of 80% (ACTE, 2018).

Postsecondary CTE concentrators achieve significantly higher earnings than those who majored in academic fields, particularly those employed in an industry related to their program of study (Jacobson & Mokher, 2014). Even though CTE recruits from a wide range of academic performers, students in the highest achievement groups are less likely to be a CTE concentrator (Levesque & Hudson, 2003). In other words, students who enter CTE courses who are already high achieving academically are least likely to complete a CTE pathway. Although these students do not complete a CTE concentrator, they still reap the benefits of participation in CTE curriculum and programming.

Opportunities for challenging careers and good salaries are changing the demographics of CTE students. Educators in individual districts are knowledgeable about the enrollment demographics of students enrolling in CTE courses. Since decisions are made based on an understanding of who the students are who are enrolling in CTE programs, this is valuable information. The decisions include what programs to offer and how to market these programs to encourage high school students to enroll. Researchers have found that students of different levels of academic standing participate in CTE (Bowden, 1998; Kerka, 2000; Langland, 1999; Ries, 1997). Levesque and Hudson (2003) found the students in high academic achievement groups were less likely to be in a CTE concentration.

There is limited research indicating that students enrolled in CTE courses are from lower socioeconomic groups. Gaunt (2005) conducted a study that looked at the profile of both CTE students and non-CTE students. He found the following: (a) CTE

students were slightly more disadvantaged than non-CTE students, (b) 39.9% of the survey respondents live with both their mother and father, (c) 19.8% live with their mother and stepfather, (d) 15% live with their mother only, (e) high school students who enrolled in CTE courses were performing lower academically, and (f) high school students who did not enroll in CTE courses were performing at one classification higher than those enrolled in CTE courses (Gaunt, 2005). This research indicates that students may be disproportionately enrolled in CTE courses based on their socioeconomic status. This further supports the broader concern that students do not have equitable access to CTE curriculum based on misconceptions about the benefits of CTE courses and appropriate student enrollment for these courses.

Motivation

Fewer than 5% of Americans finished high school in 1890 (Kantor & Tyack, 1982). In 1900, only 8% of youth attended and graduated from high school (Tyack & Cuban, 1995). In 1980, 71% of American youth attended and graduated from high school. Throughout history, it has been difficult to track both the high school dropout rate and graduation rate because there has been no standardized method to record a student's entrance into kindergarten and exit from high school (NGA Center for Best Practices, 2007). States have not had a system to track each student. In 2005, all United States governors acknowledged that states did not have a standardized system for tracking students and signed the Graduation Counts Compact (NGA Center for Best Practices, 2007). By signing the compact, the governors pledged to gather accurate data using a national formula based on research. The compact also includes common standards for reporting dropout data.

According to the National Center for Education Statistics, the status dropout rate (the percentage of individuals, age 16-24, who are not enrolled in high school and who lack a high school credential) was 10.7% in the United States—some 3.8 million of the 35.2 million young people between the ages of 16 and 24 in 2001. (ACTE, 2007, p. 1)

However, in recent years, numerous studies, such as those conducted by the Manhattan Institute and Educational Testing Service, estimated that the national high school completion rate is far lower, averaging around 70% (Greene & Winters, 2005). Roughly one third of the students who enter the ninth grade fail to complete high school within 4 years, and the United States has now slipped to 10th place in the world in high school completion.

In the past 50 years, high school completion has grown in importance—moving from the 1950s when a high school diploma was a valued asset in the labor market, to the 1970s when a diploma opened doors to promising careers, to recent years when advances in technology have transformed the labor market into one that demands highly skilled workers with a minimum of a high school diploma (Kaufman et al., 2004).

At a time when economic conditions require a workforce of lifelong learners who can quickly gain the knowledge and skills needed to work with new technologies in emerging careers, a high school diploma, at the very least, is critical for any individual who wishes to compete in the 21st century workforce. Millions of young people are out of school and grossly ill-equipped to compete in the 21st century workforce and economy (Greene & Winters, 2005). Increasing high school graduation rates would not only help put more individuals on the path to success but would also ensure that the American

economy stays strong.

CTE course participation has been demonstrated to improve high school graduation rates. High school graduates are more likely to raise healthier, better-educated children and are less likely to be teen parents (Haveman et al., 1991). Society reaps the rewards of increased graduation rates as high school graduates are also less likely to commit crimes and more likely to engage in civic activities, including voting and volunteering (Teachers College Columbia University, 2005). Increasing the male graduation rate by only 5% would result in \$4.9 billion in crime-related cost savings annually (Alliance for Excellent Education, 2017).

Students drop out of high school for a number of reasons, such as family problems, to find a job, substance abuse, or because they have fallen behind in their course taking or have received failing grades; however, another significant reason for dropping out is emerging. Many students lose interest and motivation in education because the curriculum does not seem to have a real-world application. Academics are often presented in isolation, instead of in a way that shines a spotlight on how the subject is applicable in the context of the real world. Focus groups of dropouts ages 16-24 conducted a recent report, *The Silent Epidemic* (Bridgeland et al., 2006). Sixty-nine percent of those surveyed indicated they did not feel motivated (Bridgeland et al., 2006).

A 2006 poll of at-risk California ninth and 10th graders found that six in 10 respondents were not motivated to succeed in school (Corrigan et al., 2011). In North Carolina, a March 2007 poll of likely voters showed that 91% favored expanding CTE programs specifically to make school more attractive to students thinking of dropping out (ACTE, 2007).

A report released by the Advisory Committee for the National Assessment of Vocational Education (2004) stated,

CTE empowers students by providing a range of learning opportunities that serve different learning styles. For many students, applying academic and technical skills to real-world activities, and being able to see how their learning is related to the world or work make CTE classes more interesting and motivating, and more educationally powerful than standard academic classes. (p. 2)

Positive Relationships

Students need to be known as individuals within the school community and be connected to their peers and positive adult relationships. In the 2006 High School Survey of Student Engagement, 24% of students who have considered dropping out of high school cited the reason, “No adults in the school cared about me” (Yazzie-Mintz, 2007, p. 5). One of the leading efforts in building positive adult-student relationships is the growth of smaller learning communities. Smaller learning communities with a focus on CTE, often known as career academics, have been found to increase the attendance rate and the likelihood of staying in school for students who entered the programs at high risk of dropping out. In 2001, a study conducted by Manpower Demonstration Research Corporation, a nonprofit, nonpartisan social policy research organization, found that career academics significantly cut dropout rates and increase attendance rates, credits earned toward graduation, and preparation for postsecondary education (Kemple, 2001). The career academy group’s dropout rate was reduced by one-third from the rate for the non-academy group (Kemple, 2001).

Another core component of CTE is the longstanding existence of career and

technical student organizations (CTSOs) that engage students in cocurricular activities that are closely related to CTE classroom programs. Young people involved in CTSOs number close to 2 million, and each works regularly with an adult advisor to prepare for local, regional, and national competitions; takes on student leadership roles in the organizations; and develops a range of project management, public speaking, and leadership skills. A recent study found that CTSO activities positively affect student academic engagement; and the stronger the student's involvement, the better the results (Stone, 2002).

Mentoring and providing positive relationships with adults in the broader community are also hallmarks of quality CTE programs. Whether through a formal mentoring program or by placing students in job shadowing or internship opportunities, CTE links the community in ways many other high school programs cannot. MENTOR (n.d.) is an organization focused on the expansion of mentoring activities nationwide. They concluded that given their benefits, such as positive association with student grade point averages, attendance rates, self-esteem, and the feeling that school was relevant to work, work-based mentoring efforts are important strategies for helping high school students make a smooth transition to adulthood (MENTOR, n.d.).

College and Career Readiness

It is commonly said that the goal of high school reform is to ensure all students graduate college and career ready (Achieve, Inc., 2016). What do we mean by college ready? College today means much more than just pursuing a 4-year degree at a university. Being college ready means being prepared for any postsecondary education or training experience, including study at 2- and 4-year institutes leading to a postsecondary

credential (i.e., a certification, license, associate's degree, or bachelor's degree). Being ready for college means a high school graduate has the knowledge and skills necessary to qualify for and succeed in entry-level, credit-bearing college courses without the need for remedial coursework (Achieve, Inc., 2016).

What do we mean by career ready? In today's economy, a career is not just a job. A career provides a family-sustaining wage and pathways to advancement and requires postsecondary training or education. A job may be obtained with only a high school diploma but offers no guarantee of advancement or mobility. Being ready for a career means a high school graduate has the knowledge and skills needed to qualify for and succeed in postsecondary job training and/or education necessary for their chosen career (i.e., community college, technical/vocational program, apprenticeship, or significant on-the-job training; Achieve, Inc., 2016).

In North Carolina, students are considered career and college ready when they have the knowledge and academic preparation needed to enroll and succeed, without the need for remediation, in introductory college credit-bearing courses in English language arts and mathematics within an associate or baccalaureate degree program. The same attributes and levels of achievement are needed for entry into and success in postsecondary workforce education and the military or to go directly into a job that offers gainful employment and career advancement (Southern Regional Education Board, 2015).

Perna (2015) said,

Students who think they want to go to college for a specific career might change their mind completely after experiencing a career program. Or maybe after

experiencing the career program, students will solidify the original decisions made about educational and career direction. The point is students who take part in career-focused learning have a much wider breadth of knowledge, experience, and guidance from which to make their choices. Career programs are a powerful tool to help them know what they don't know in bridge their personal awareness gap. (Southern Regional Education Board, 2015, p. 140)

Aligned standards provide the foundation to improve curriculum, instruction, and assessment and better prepare students for college and the workplace. They also communicate core learning goals to teachers, parents, and students. Adoption of college and career ready standards is a first step; states need to determine what courses align to specific standards, how to incorporate the standards into pathways to graduation, and how to measure college and career ready standards through assessments that signal readiness for college and careers (Achieve, Inc., 2017).

With the growing complexity of the world and the increasing demands of the 21st century workforce, there is little question that all students should graduate from high school fully prepared for college and careers. Simply put, college and career readiness is the umbrella under which many education and workforce policies, programs, and initiatives thrive. From high-quality early education and strong foundational standards in elementary school to rigorous CTE programs and college completion goals, college and career readiness is the unifying agenda across the education pipeline (Achieve, Inc., 2017).

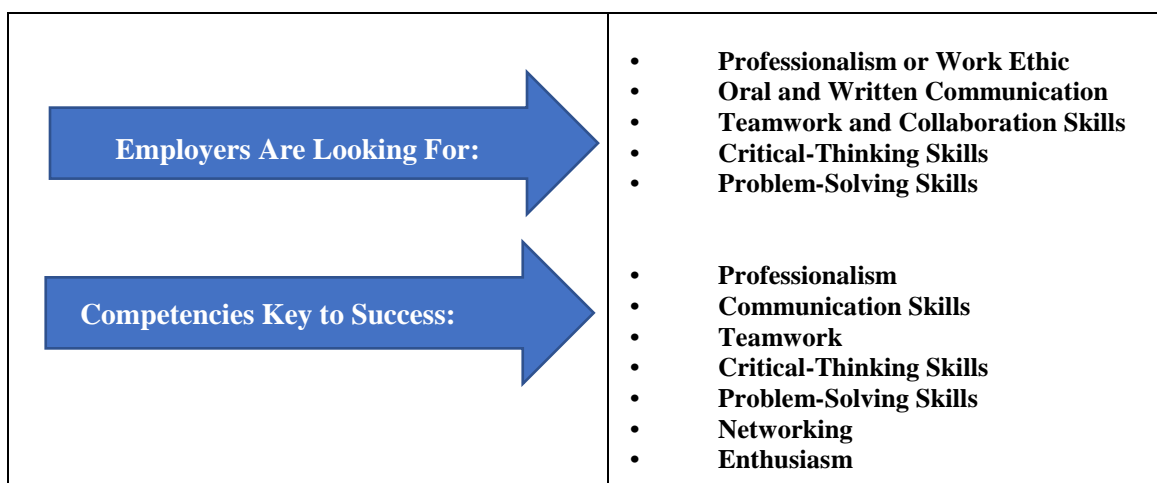
In 2013, Junior Achievement USA sponsored a summit of leading education experts and taught leaders to create a relevant definition for work and career readiness.

After much discussion, the summit concluded that creating a new definition of work readiness would be counterproductive because of the uncertainty about what the future workplace would look like (Junior Achievement, 2013). They did reach a consensus on what knowledge and skills good workers would need. Those skills included the ability to identify a problem, apply effective problem-solving and decision-making skills, and recognize and seize opportunities when they arise.

The U.S. Department of Labor: Bureau of Labor Statistics (2014) asserted there are certain skills key to the success of young workers in the 21st century workplace and that correlate to soft skills that are attractive to employers hiring new workers.

Figure 3

Labor Department: Essential Job Skills







ACT, which is probably best known for its college admissions and placement test, also provides more than 100 other services for education and workforce development. One of those services is the National Career Readiness Certification Plus, which is an assessment of soft skills that helps employers assess the work readiness of job candidates. It focuses on characteristics or traits that are presumably measurable and considered

important by employers for predicting success in the workplace.

Figure 4

ACT: Essential Soft Skills

Domain	Characteristics/Traits
 Work Discipline	Productivity • Dependability
 Teamwork	Tolerance • Communication • Attitude
 Customer Service Orientation	Interpersonal Skills • Perseverance
 Managerial Potential	Persuasion • Enthusiasm • Problem Solving

American employers are deeply concerned about the deficit of foundational skills emerging in the workforce. Many youths are finding it difficult to transition from school to work because they are unprepared for the challenges they face in an unfamiliar environment. This trend will continue unless education organizations and business communities find more creative ways to partner and focus on work-readiness strategies.

Skills Gap

Many of the jobs that are now available require some type of education or training beyond high school. It was projected that by 2020, 65% of all jobs would require some form of postsecondary education (Carnevale et al., 2013).

In recent years, there has been a great deal of discussion about the skills gap—the discrepancy between the skills U.S. workers have and the skills required by U.S. businesses to remain globally competitive. Although researchers have worked to understand the existence and nature of such a gap and although most people—from business leaders to individual contributors—agree there is a skills gap, little is known about how businesses are addressing the issue, whether those solutions are working, and what else needs to be done to prepare for the future of work.

It is a skills gap that threatens the sustainability of businesses around the world. A big part of the skills gap is a shortage of people skilled in STEM (science, technology, education, and math) industries, as well as the gap in soft skills such as communication and advanced leadership skills (Freifeld, 2014).

The skills gap is well documented in Wagner’s (2008) book. Wagner identified seven skills that are essential for success in the workforce. His information was obtained through conducting interviews and surveying CEOs and representatives of major companies in the United States. Through his research, Wagner found that a large number of new entrants in the workforce lack the necessary soft skills. Soft skills are the character traits and interpersonal skills that characterize a person’s relationship with other people. In the workplace, soft skills are considered a complement to hard skills, which refers to a person’s knowledge in occupational skills (Serby, 2003).

Ed Gordon (2008), author of “Winning the Global Talent Showdown” and “Future Jobs: Solving the Employment and Skills Crisis,” believed the education to employment to talent creation system—college through career training—needs to be revamped. Gordon asserted, “It’s not a skills problem; it’s a talent issue” (Freifeld, 2014,

para. 3).

People do not have the liberal arts and thinking skills and specific career training they need in today's technologically advancing world. We need the skills to keep this very complex technology working period this includes medical technology, aerospace, automotive, etc. We need people to build airplanes, keep the lights on at the Super Bowl, fix high-tech cars, and plumbing systems, and teach kids writing skills. (Freifeld, 2021, p. 3)

Gordon (2008) predicted if the structure did not change, there would be 14 million to 25 million vacant jobs in 2020 that we would not be able to fill. "You can have all the latest technology want," he noted, "but if you don't have the talent behind it, your business is not sustainable" (Freifeld, 2014, para. 3).

21st Century Skills

Twenty-first century skills are abilities today's students need to succeed in their careers during the information age. Those skills include critical thinking, creativity, collaboration, communication, information literacy, media literacy, technology literacy, flexibility, leadership, initiative, productivity, and social skills (Stauffer, 2020). These skills are intended to help students keep up with the lightning pace of today's modern markets. Each skill is unique in how it helps students, but they are essential in the age of the Internet.

It should be noted that the 21st century skills concept encompasses a wide-ranging and amorphous body of knowledge and skills that is not easy to define and that has not been officially codified or categorized. While the term is widely used in education, it is not always defined consistently, which can lead to confusion and divergent

interpretations. In addition, a number of related terms including applied skills, cross-curricular skills, cross-disciplinary skills, interdisciplinary skills, transferable skills, transversal skills, noncognitive skills, and soft skills are also widely used in reference to the general forms of knowledge and skill commonly associated with 21st century skills. While these different terms may not be strictly synonymous and they may have divergent or specialized meanings in certain technical contexts, these diverse sets of skills are being addressed in this one entry for practicality in usefulness (Stauffer, 2020).

Generally speaking, the 21st century skills concept is motivated by the belief that teaching students the most relevant, useful, in-demand, and universally applicable skills should be prioritized in today's schools and by the related belief that many schools may not sufficiently prioritize such skills or effectively teach them to students. The basic idea is that students who will come of age in the 21st century need to be taught different skills than those learned by students in the 20th century and that the skills they learn should reflect specific demands that will be placed on them in a complex, competitive, knowledge-based, information-age, technology-driven economy and society.

Given that there is no clear consensus on what skills specifically constitute 21st century skills, the concept tends to be interpreted and applied in different ways from state to state or school to school, which can lead to confusion and inconsistency. In other words, the concept has become a touchstone in a larger debate about what public schools should be teaching and what the purpose of public education should be. The push to prioritize 21st century skills is typically motivated by the belief that all students should be equipped with the knowledge, skills, work habits, and character traits they will need to pursue challenging careers after graduation (Stauffer, 2020).

Ken Kay, CEO of Edleader 21, recognized that some educators have grown weary of the term 21st century learning; the drive to transform education matters more today, a lot more than when we started the conversation (Britten, 2009). The 21st century will require a knowledge generation not just information delivery, and schools will need to create a culture of inquiry (Britten, 2009).

A new study from the National Association of Colleges and Employers identified the gaps between graduate views of their skills and the views of those who hired them (Inside Higher Ed, 2018). The association surveyed 4,213 graduating seniors and 201 employers on eight competent skills it considers necessary to be prepared to enter the workplace. A high percentage of students indicated in almost every category they thought they were proficient, but the employers disagreed.

Table 1

Employer View Versus Student View

	Proficient*	Proficient**
Professionalism/work ethic	42.5%	89.4%
Oral/written communications	41.6%	79.4%
Critical thinking/problem-solving	55.8%	79.9%
Teamwork/collaboration	77%	85.1%
Leadership	33%	70.5%
Digital technology	65.8%	59.9%
Career management	17.3%	40.9%
Global/intercultural fluency	20.7%	34.9%

Note. *Employer View; **Student View.

Brandon Busteed (2017), executive director of Gallup's higher education division stated the easy solution: Set students up in a more professional environment. Busteed said this could be internships or co-op programs. If students can go to an actual office, then the environment should be brought to them, so they have a better sense of how a

workplace runs. This is particularly useful for applying knowledge and skills in real-world settings, critical-thinking skills, and written and oral communication skills—areas in which fewer than three in 10 employers think recent college graduates are well prepared.

Talent

By definition, a skill is something you have learned through work experience, education, training, and volunteer activities (“How to Differentiate Between Hard Skills, Soft Skills and Essential Skills,” n.d.). Knowing your skills is crucial in pursuing and securing the right job. Career skills usually fall into two categories: hard and soft. Hard skills involve specific knowledge such as technical proficiencies and data analysis, whereas soft skills focus on emotional intelligence and behavior such as communication and problem-solving.

Soft skills are unquantifiable, intangible skills that are also known as people skills. Some examples of soft skills include having a positive attitude, communicating well, creative thinking, teamwork, and problem-solving (“How to Differentiate Between Hard Skills, Soft Skills and Essential Skills,” n.d.).

Hard skills are quantifiable, tangible skills that include technical skills. Hard skill abilities include conducting research on the Internet, using specific computer applications, or operating a specific piece of machinery or equipment (“How to Differentiate Between Hard Skills, Soft Skills and Essential Skills,” n.d.).

It is the combination of hard and soft skills that form your overall essential skills, which is what helps you secure and maintain employment. These essential skills vary by occupation or profession. They are determined by analyzing the tasks current workers in that occupation perform daily and are rated based on their degree of complexity (“How to

Differentiate Between Hard Skills, Soft Skills and Essential Skills,” n.d.).

Graduates need strong communication and problem-solving skills if they want to interview well and succeed in the workplace, because effective writing, speaking, and critical thinking enable them to accomplish business goals and get ahead. Dan Schawbel, research director at Future Workplace, said in a statement, “No working day will be complete without writing an email or tackling a new challenge, so the sooner you develop these skills, the more employable you will become” (Dishman, 2016, para. 5).

Data show there are five big challenges in preparing K-12 students for the world of work. Those challenges are college-ready obsessions, few models with limited resources, standardized testing pressures, the rapid pace of technological change, and creating meaningful internships (Klein, 2020).

More than half of the 586 school and district leaders who responded to a survey in December 2019 by the Ed Week Research Center said that updating curriculum to get students ready for the jobs of the future is a top priority (Klein, 2020).

Preparing students for the future of work may sound simple, but educators say there are challenges, and here is a look at five big ones. Challenge 1 is that parents and community members often expect schools to get their students ready for college, not for the world of work. Forty-two percent of educators surveyed cited the perception that schools are supposed to get students ready for college, not work as one of the biggest barriers to offering curricula to address the skills students will need for jobs of the future. William Moran, the principal of Dexter High School near Ann Arbor, Michigan, said “parents would rather see their child take Advanced Placement classes than spend a few hours a week in a research lab, exploring the world of work” (Klein, 2020, para. 11).

Challenge 2 is that nearly a third of educators say there are very few good examples of how to revamp curricula to help students prepare for the future of work. Principal Sara Turrell said it is tough for her relatively remote district to offer salaries that will attract educators who can teach skills her students need for future jobs (Klein, 2020). “It’s very difficult to get people to want to work in a smaller rural community” (Klein, 2020, para. 18).

The third challenge from nearly a third of educators surveyed is the pressure they face from the curricula being tightly tied to standardized tests. Paul Newton, the principal of Westfield Middle School in Massachusetts, said there is a lot of pressure on kids to do well on standardized testing, so the first things that suffer are the employability skills students need in the workplace (Klein, 2020). He stated, “It’s much more important that we are teaching kids to be thinkers and promoting the skills they need to be successful” (Klein, 2020, para. 18).

The rapid pace of technological change is the fourth big challenge schools are facing. Forty percent of educators surveyed said their districts made changes to the curricula to address the technical skills students will need for jobs of the future. Rita Platt, the principal of two elementary schools in St. Croix Fall, Wisconsin, said “it’s more important to make sure students master skills they are sure to need no matter how technology evolves, including goal setting and critical thinking” (Klein, 2020, para. 27).

The fifth big challenge is that educators could offer more meaningful internships. Just 15% of educators surveyed said the internships were required in their districts or that the majority of students do them. Another 44% said their schools offer internships for credit, but most students do not take advantage of the opportunity. Educators say staffing

capabilities to supervise meaningful internships are a problem, and educators in remote rural areas say there just are not a lot of possibilities nearby. Gail Ellis, the technology director for a small rural district in Spokane, Missouri, stated that “many of the companies her students might want to work with are a 30- to 40-minute drive away” (Klein, 2020, para. 34) and this limits their opportunities for school to work opportunities. The lack of internships is a missed opportunity for work-based learning experiences that can help students figure out what careers they might like and which ones are not for them (Klein, 2020).

Workforce

In the United States, unemployment was around 4% to 5% before the Great Recession when large numbers of businesses failed, many people lost their homes, and demand for goods and services—and the labor to produce them—plummeted. Unemployment reached 10% in 2009 but declined more or less steadily to 3.5% in February 2020 (Faulk, 2021).

By 2022, technology is expected to have displaced 75 million jobs globally, according to new research from LinkedIn; yet within that same period, it stated those same forces will have created 133 million new jobs (Gilchrist, 2019). While tech expertise may be useful for pursuing new career paths, the key professional traits that are likely to persist over time and across industries are actually soft skills, said LinkedIn; and these are the skills employers globally are finding it hardest to find (Gilchrist, 2019).

My Future NC

On February 20, 2019, My Future NC unveiled its goal and bold vision for the future of education in our state: My Future NC will work to ensure that by 2030, 2

million North Carolinians have a high-quality postsecondary degree or credential. My Future NC is a statewide nonprofit organization focused on educational attainment and is the result of cross-sector collaboration between North Carolina leaders in education, business, and government. Andrea Smith, Bank of America CEO and My Future NC co-chair, said,

Two of every three new jobs now require some form of postsecondary education—whether that is training credentials, an associate degree, a four-year degree, or higher. The reality underscores how critical education is to career growth and how important it is to increase economic mobility. (The Goal, 2019, para. 3)

The Skills Gap Problem

As our economy grows, the vast majority of new jobs require education beyond a high school diploma, but fewer than half of North Carolinians ages 25-44 have a high-quality postsecondary degree or credential. The attainment rate also varies—sometimes significantly so—by race and ethnicity. The result is our education system and our economy are out of sync. Job seekers struggle to find jobs, and employers struggle to find the talent they need to fill openings. If we stay on the trajectory projected in 2019 of increased degrees and credentials, by 2030, North Carolina will still fall short by at least 400,000 individuals with not having the skills needed to fill our state’s projected job needs (The Goal, 2019).

Cost of College

For those who question the value of college in this era of soaring student debt, the attitudes and experiences of today’s young adults provide a compelling answer. On virtually every measure of economic well-being and career attainment, young college

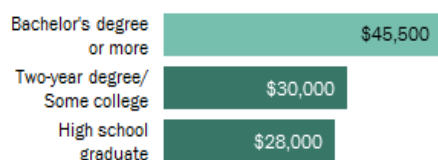
graduates are outperforming their peers with less education. And when today's young adults are compared with previous generations, the disparity in economic outcomes between college graduates and those with a high school diploma or less formal schooling has never been greater in the modern era.

Figure 5

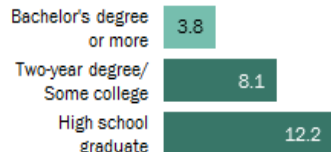
The Rising Cost of Not Going to College

Disparity among Millennials Ages 25-32 By Education Level in Terms of Annual Earnings ...

(median among full-time workers, in 2012 dollars)



Unemployment Rate ...



And Share Living in Poverty ...



Notes: Median annual earnings are based on earnings and work status during the calendar year prior to interview and limited to 25- to 32-year-olds who worked full time during the previous calendar year and reported positive earnings. "Full time" refers to those who usually worked at least 35 hours a week last year. The unemployment rate refers to the share of the labor force (those working or actively seeking work) who are not employed. Poverty is based on the respondent's family income in the calendar year preceding the survey.

Source: Pew Research Center tabulations of the 2013 March Current Population Survey (CPS) Integrated Public Use Micro Sample

Every year, North Carolina's elementary and secondary schools educate more students. In 2000-2001, public and private schools served approximately 1.4 million

students; during the 2016-2017 school year, that total climbed to over 1.8 million. The proportion of students who graduate from high school has increased steadily over the past several years, rising from approximately 74% in 2010 to nearly 87% in 2017 (Edmunds, 2018). Also, the number of students taking college-level courses before graduating from high school has almost tripled over the past 3 years (Edmunds, 2018).

Fifty-one percent of North Carolina high school graduates in the classes of 2009 through 2011 earned a postsecondary degree within 6 years of enrollment, with bachelor's degrees making up the bulk of those degrees (73%), followed by associate's degrees (20%) and other credentials (7%; Tippet & Kahn, 2018).

Eighty-one percent of students who enrolled in postsecondary education immediately after completion of high school persist into their second year of postsecondary education, while more students than ever before are transferring from 2-year to 4-year colleges; more than 12,000 in 2016, compared to only 3,400 in 1986 (D'Amico & Chapman, 2018). Alongside all those successes, however, and behind many of those numbers is a host of students who, every day, continue to slip through the cracks and fall off the continuum. To improve attainment across North Carolina, we must identify and address these slippages (The Goal, 2019).

CTE Perkins V

Perkins V was signed into law by President Trump on July 31, 2018 (U.S. Department of Education, 2018). This bipartisan measure reauthorized the Carl D Perkins Career and Technical Education Act of 2006 (Perkins Collaborative Resource Network, n.d.) and continued Congress's commitment to providing nearly \$1.3 billion annually for CTE programs for our nation's youth and adults. Perkins V represents an important

opportunity to expand opportunities for every student to explore, choose, and follow CTE programs of study and career pathways to earn credentials of value (Perkins Collaborative Resource Network, 2019).

“The law creates new opportunities to improve CTE and enables more flexibility for states to meet the unique needs of their learners, educators, and employers,” said Scott Stump, Assistant Secretary for Career, Technical, and Adult Education (U.S. Department of Education, 2018, para. 2). Provisions in Perkins V allow school districts to use federal funds to provide all students, not just those enrolled in CTE, career exploration and developmental activities in the middle grades and for comprehensive guidance and academic counseling in the upper grades. It removes the department from negotiating state performance levels for student academic attainment and other outcomes, leaving it to states and their stakeholders to determine their performance goals (U.S. Department of Education, 2018).

Summary

As the world of work changes, educational programs preparing students for these jobs need to change as well. As CTE programs change, the public must be educated about these changes. According to Tuttle (1987), to improve the image of CTE, strategic plans need to be developed at every level. With increased accountability for student academic performance, CTE programs must track data and report student performance outcomes to the public (Kibler, 1992).

CTE is a proven strategy that educates students in the context of careers and prepares students to succeed in postsecondary education and the workforce. It is also a critical strategy to addressing the nation’s high school graduation crisis. For thousands of

high school students, including those on the verge of dropping out, CTE offers relevant learning experiences that answer the question, “Why do I have to learn this,” while at the same time enhancing student academic achievement and meeting industry needs.

By providing relevance and strong relationships between students and the education environment, CTE can be an effective means of ensuring that students complete high school. For those students who have already left the education system, alternative delivery programs designed around CTE provide practical skills and an approach to education that can reengage disconnected youth.

The study examined the skills gap students needed for participation in CTE programs, CTE’s effect on student motivation, CTE’s effect on student abilities to be college and career ready, and CTE student participation in employment or secondary education after graduation.

Chapter 3: Methodology

Introduction

The purpose of the study was to examine three small rural schools in western North Carolina to determine the perceptions of the skill levels new entrance into the workforce should and do possess. The study also solicited feedback from high school principals, CTE directors, and employers about the effectiveness of the CTE program in each of their school systems.

A gap is something that remains to be done or learned in an area of research. It is a gap in the knowledge in the field of research in the study. Every research project must, in some way, address a gap; that is, attempt to fill in some piece of information missing in the study. The gap in knowledge for the study was to clearly understand the relationship between CTE participation and factors that influence students to enroll in CTE courses (Maxwell, n.d.).

In this chapter, the research methodology is explained. The guiding question for the study was, “The purpose of the study was to determine the impact of participation in CTE in determining the skills gap in selected rural communities”; specifically,

1. What effect does participation in CTE classes have on students and their ability to be career and college ready?
2. Based on the perception of local employers, how well did the CTE programs of three rural high schools in western North Carolina school districts prepare students for job and career readiness?
3. What is the overall effectiveness of the CTE experience in three rural high schools in western North Carolina school districts?

Research Design

To answer these research questions, a design of qualitative method was conducted. Creswell (2005) explained qualitative researchers rely on participant perceptions and collect data that are steeped in participant words or text. Qualitative research is appropriate when the researcher identifies a complex problem but requires deep exploration through qualitative data analysis. Qualitative data allow researchers to garner a deeper understanding of the various aspects of a particular problem and to analyze these data through both description and theme. Creswell's (2003) work on research design stated,

Examining the relationships between and among variables is central to answering questions and hypothesis through surveys and experiments. The reduction to a parsimonious set of variables, tightly controlled through design or statistical analysis, provides measures or observations for testing a theory. Objective data result from empirical observations and measures. Validity and reliability of scores on instruments lead to meaningful interpretations of data. (p. 137)

Case Study

To answer the research questions, a qualitative methodology was conducted. A case study is an in-depth exploration of a bounded system (e.g., an activity, event, process, or individuals) based on extensive data collection (Creswell, 2005). Educational case studies frequently focus on the comparative experiences of individuals (Creswell, 2005). Breslin and Buchanan (2008) noted that case studies and the use of qualitative data have a "rich history for exploring the space between the world, of theory and the experience of practice" (p. 36). Further, the gathering of qualitative data allows

researchers to examine complex situations by looking at the how and why of individual circumstances (Yin, 2003). Creswell (2005) reported that qualitative research depends on the myriad viewpoints of participants. The researcher asks “broad, general” (Creswell, 2005, p. 39) questions, records the data, and then subjectively analyzes the responses for themes.

Participants

Three principals, three CTE directors, and the top three employers in each selected school district in three rural counties in western North Carolina were asked to participate in this qualitative research study. Qualitative researchers need to focus on the depth, not breadth, of information (Rossman & Rallis, 2012). For this reason, a small sample size allowed me to be more focused on a deeper understanding of the overall effectiveness of the CTE experience.

To gain access to these participants, permission from my chair and committee was requested. In addition, permission to conduct research from the district superintendent was obtained. Upon gaining permission from the IRB committee, the list of participants from each school district was generated. Next, these principals and CTE directors were asked to take part in the study. Before taking part, they were asked to sign the consent form found in Appendix A. Next, CTE directors provided me with the names of the top three employers in each county so I could interview each of their HR directors.

Participants were assured of confidentiality and were informed of their right to withdraw from the study at any time. Participants were informed of the scope of the study and were allowed to preview data conclusions as part of member checking. According to Krefting (1990),

Member checking is a technique that consists of continually testing with informants the researcher's data, analytical categories, interpretations, and conclusions by allowing the participants to review the conclusions helped to ensure the participants' viewpoints were accurately transferred into data. (p. 219)

Data Collection

The research took place during the 2020-2021 school year. To properly capture the data, interviews were conducted to mine the data and to drill even deeper into respondent answers from the interview questions. The interview protocol can be found in Appendix B. The questions that were asked during the interview process were as follows and are also located in Appendix C:

1. Is the program's or school's message to all students that CTE is a pathway into college and/or career?
2. Does the CTE program prepare students for and offer a range of college credit-bearing dual enrollment and/or AP courses in science, computer science, math, and the like?
3. Are the CTE program offerings a mix of the old trades (which now require sophisticated math and computer literacy) and high growth fields, such as cybersecurity, healthcare, and engineering?
4. Are CTE student aspirations based on well-informed decisions, not demographics, and do they reflect the full spectrum of postsecondary options, including apprenticeship, certifications, community college, 4-year institutions, and beyond?
5. With which higher education institutions does the CTE program/school have

partnerships?

6. Does the CTE program provide high-quality, work-based learning experiences supervised by employers and include time for learning from work?
7. Are students learning transferable skills that will serve them well in the innovation economy?
8. Are the outcomes of CTE measured according to appropriate criteria?
9. Does the CTE program teach essential skills that include teamwork, critical thinking, and complex problem-solving skills that allow students to be successful for the rest of their lives?
10. How does the content being taught in CTE classes mirror authenticity in the field?
11. What weaknesses do you see with the CTE programs being taught in the high schools?
12. What essential skills are lacking from students to be career and college ready?
13. Does participation in CTE have an effect on student ability to be career and college ready?
14. What is the overall effectiveness of the CTE experience within your school district?
15. What should high school CTE graduates know and be able to do?

Time parameters were explained and incorporated into the interview to help participants feel more relaxed before the actual interview took place. McNamara (2009) explained that eight principles should be followed before a formal interview begins. These principles include conducting the interview in a setting with few distractions,

explaining to the participants the purpose of the interview, explaining the confidentiality terms, detailing the format of the interview, giving the time parameters of the interview, providing the participants with my contact information, allowing participants to ask questions before the interview begins, and recording the interview so there is a record of the conversation. All guidelines were followed.

To accurately work with the data from individual interviews, an audio recorder was utilized. A transcript was created from the audio data, and the transcript was analyzed for recurring themes within the individual interviews.

Limitations and Strengths

Anderson (2010) noted that all qualitative research has certain limitations. Among the limitations cited were researcher bias, researcher influence on participants, researcher skill, and concerns over anonymity. Although specific steps were taken to counter these limitations, it is still possible that the study was limited by these factors. In addition, although it is hoped that the results obtained will be generalized to other school districts, it is not possible to be certain that the information will be useful for other CTE programs. COVID-19 forced everyone to turn to technology for work and school. While this may seem simple to most, it sheds light on the barriers to academic success many students face daily. CTE courses are built on teaching essential skills through face-to-face experiences. The interpersonal engagement, deep relationships, trust, and desire to explore a trade developed through meaningful physical connections and these experiences are essential for the future of the workforce pipeline.

Strengths of qualitative data cited by Anderson (2010) include a depth of research results; the ability of the researcher to revise the research framework as the need arises;

the ability of the researcher to discover powerful, subtle points that might be missed by other research approaches; and the ability of the researcher to transfer findings to another setting.

Summary

Through data collected, it was determined if the skills being taught in CTE programs address the current and future needs of society and employers. The study also examined the effectiveness of the CTE programs in three rural high schools in western North Carolina school districts.

Another purpose of the study examined CTE's role in keeping students in school and closing the skills gap future employers are looking for. Research has shown that students who complete a CTE program are likely to complete high school (Bishop & Mane, 2003). CTE is an effective method of dropout prevention and is credited with keeping a number of at-risk students in school.

Data collected from interviews conducted with principals, CTE directors, and local employers identified perceptions of CTE programs and preparedness for life after high school. Each group provided information on the importance of essential skills and their overall impression of student preparedness.

The conclusions from the research were shared with administrators, superintendents, and surrounding school districts. It is hypothesized that these groups will especially be interested in the research findings and will use data to strengthen CTE programs geared towards developing students to be career and college ready. In the next chapter, the results are discussed in detail.

Chapter 4: Results

Introduction

The purpose of the study was to determine the impact of participation in CTE in determining the skills gap in selected rural communities. My research project focused on the impact CTE has in affecting student abilities to be career and college ready and the overall effectiveness of the CTE experience. The purpose was to clearly understand the relationship between CTE participation and the factors that influence students to enroll in CTE courses. The study took place in three small rural counties in the western region of North Carolina. To properly capture the data, face-to-face interviews were conducted with principals, CTE directors, and HR directors from employers of the county to mine the data and drill even deeper into respondent answers to the interview questions. Three high school principals and three CTE directors from each county were interviewed. Nine HR directors, three from each county in which each school district was represented, were also interviewed. This chapter reviews the research questions and reports the results from the 15 individual interviews.

Through the findings of the study, I intended to provide feedback about the effectiveness of CTE and the skills students need to be effective employees in the 21st century. It is intended that the data compiled and reported in the study have the potential to generate improvements on how local school districts develop their CTE programs and how to improve opportunities for students to be career and college ready.

Research Questions

The guiding question for the study was, “Are the skills being taught in CTE programs addressing the current and future needs of society and employers”; specifically,

1. What effect does participation in CTE classes have on students and their ability to be career and college ready?
2. Based on the perception of local employers, how well did the CTE programs of three mountain counties of western North Carolina prepare students for job and career readiness?
3. What is the overall effectiveness of the CTE experience in the school districts of three mountain counties of western North Carolina?

Participants

Three high school principals, three CTE directors, and nine HR directors from local businesses agreed to take part in the study. Questions presented to the group were centered around CTE and the preparedness for students to enter the workforce. The participants were individually interviewed and audio recorded to collect data. The recordings were then transcribed. Transcripts were read, and themes were identified to answer the research questions. The interviews took place at the local high school, central office, and local businesses. As the interviews took place, themes associated with the local CTE program were identified by principals, CTE directors, and HR directors. An analysis of those themes is summarized with answers to the individual research questions. Table 2 reports the current roles of the participants.

Table 2*Participant Roles*

Participant	Role	Location
P1	Principal	High school
P2	CTE Director	Central office
P3	HR Director	Employer
P4	HR Director	Employer
P5	HR Director	Employer
P6	Principal	High school
P7	CTE Director	Central office
P8	HR Director	Employer
P9	HR Director	Employer
P10	HR Director	Employer
P11	Principal	High school
P12	CTE Director	Central office
P13	HR Director	Employer
P14	HR Director	Employer
P15	HR Director	Employer

Interview Results

Interview questions were developed in a yes/no format to address the research questions from the study. Section 1 of the study summarizes the results from high school principals. Section 2 of the study gives a summary of the results from CTE directors. Section 3 of the study gives a summary of the results from HR directors.

Table 3 summarizes principal results from the interview questions.

Table 3*High School Principal Responses*

Question	Yes	No	Unknown	Note
1. Is the program's or school's message to all students that CTE is a pathway into college and/or career?	3			
2. Does the CTE program prepare students for and offer a range of college credit-bearing dual enrollment and/or AP courses in science, computer science, math, and the like?	3			
3. Are the CTE program offerings a mix of the old trades (which now require sophisticated math and computer literacy) and high-growth fields, such as cybersecurity, health care, and engineering?	3			
4. Are CTE students' aspirations based on well-informed decisions, not demographics, and do they reflect the full spectrum of postsecondary options, including apprenticeship, certifications, Community College, 4-year institutions, and beyond?	3			
5. With which higher education institutions do the CTE program/school have partnerships?				*
6. Does the CTE program provide high-quality, work-based learning experiences supervised by employers and include time for learning from work?	3			
7. Are students learning transferable skills that will serve them well in the innovation economy?	3			
8. Are the outcomes of CTE measured according to appropriate criteria?	2	1		
9. Does the CTE program teach essential skills that include teamwork, critical thinking, and complex problem-solving skills that allow students to be successful for the rest of their life?	3			
10. How does the content being taught in CTE classes mirror authenticity in the field?	3			
11. What weaknesses do you see with the CTE programs being taught in the high schools?	3			
12. What essential skills are lacking from students to be Career and College Ready?				*
13. Does participation in CTE have an effect on student ability to be Career and College Ready?	3			
14. What is the overall effectiveness of the CTE experience within your school district?				*
15. What should high school CTE graduates know and be able to do?				*

Note. *Question 5: All participants knew their participating college institutions. Question 12: P1–Soft skills, being on time, knowing the professional skills, communication; P6–Ability to think about the future, soft skills, interaction communication; P11–Work ethic, communication. Question 14–P1–3 to 4; P6–4; P11–4. Question 15: P1 said, “a really good sense of what they want to do and what steps they need to take to be successful”; P6 answered, “Students learn how to interact with people, take directions / follow directions, soft skills”; P11 stated, “Students should be able to work with others, show up and be ready to work, and have a positive attitude.”

Summary of High School Principal Interviews

For the purpose of reporting, the high school principal interview participants are identified as Participant 1 (P1), Participant 6 (P6), and Participant 11 (P11).

Research Question 1 Results

What effect does participation in CTE have on students and their ability to be career and college ready? All three principals said “yes,” participation in CTE does have an effect on student abilities to be career and college ready. Principals know a career readiness education is critical in schools because it prepares students for life after college as they begin their careers. Principals agree that CTE gives students a plan to move forward. CTE challenges students to become much more self-motivated and self-disciplined. Principals identified skills that are necessary to increase college and career readiness. Those skills included critical thinking, communication, knowledge, integration, and perseverance.

P1, P6, and P11 all answered “yes” to Question 1 and agreed that the school’s message to all students is that CTE is a pathway into college and/or career. P1 was in his

first year as a high school principal and he planned to make CTE even stronger. He said, “I want to make sure students know there are other options besides a 4-year university and I want to strengthen the student advisement program.” P6 explained, “the program’s message is definitely that you can go to college and you can get into a career.”

P1, P6, and P11 all answered “yes” to Question 2. All three high schools have programs that offer a range of higher-level courses. P1 said, “that is a focus of ours, to combine all of those areas together so that CTE is not separate and it's part of the bigger picture in the framework of what we’re doing at the high school.” P6 and P11 agreed that their strong partnerships with local community colleges build the strength of these courses.

P1, P6, and P11 all answered “yes” to Question 3 and are working to add more opportunities. All three high schools were offering a mix of the old trades, such as welding, automotive, plumbing, electrical, carpentry, and masonry. P6 was growing her program with Project Lead the Way, and P11 was adding AP Computer Science. All three participants agreed it was a challenge finding highly qualified teachers to teach the advanced levels but were partnering with their local community colleges to improve those areas.

P1, P6, and P11 answered “yes” to Question 4 that student aspirations were based on well-informed decisions and not demographics. All three high schools have a career development coordinator or college liaison who works with students and their parents to make well-informed decisions on a student’s future after high school.

P1, P6, and P11 all had partnerships with their local community colleges and 4-year institutions. Each community college has developed a satellite campus at each high

school to offer dual enrollment classes for students. All students can take classes during high school at a community college or a 4-year university.

P1, P6, and P11 all agreed on Question 6 that students were lacking some essential skills to be career and college ready. P6 responded, “students lack the ability on how to make a plan and follow through with it.” She also sees a lack of soft skills and how to interact with people. P1 stated, “students are lacking in soft skills. Students need to be better at being on time and the professional piece’s students need to do the whole job.” P11 commented that he sees students needing development in critical thinking and complex problem-solving skills. He also replied, “students need to be able to get to work on time and show up for work period.”

P1, P6, and P11 all answered Question 7 with “yes,” participation in CTE has an effect on student abilities to be career and college ready. P6 said, “it gives them the skills to make a plan and move forward with it.” P11 thinks that when students leave the CTE program, they are ready to go do something and be productive members of society or go on and continue their postsecondary education.

Research Question 2 Results

Based on the perception of local employers, how well do the CTE programs of three mountain counties of western North Carolina prepare students for job and career readiness? All three principals agreed that business partnerships were a must for a strong CTE program. Business partnerships create a more prepared workforce. Local businesses support public schools by offering internships and job shadowing opportunities. Partnerships help produce a better educated future workforce. Students get hands-on, real-world work experience that helps them gain a better understanding of the

specific skills and education employers are looking for. As principals discussed effective business partnerships, they identified the need to promote shared learning goals, increasing opportunities for students, and creating an inclusive learning environment.

P1, P6, and P11 answered “yes” to Question 6 and explained all students have the opportunity for work-based learning experiences. P1 had a concern that more students needed to be participating, and he was having meetings with the business community to provide even more opportunities. P6 replied their program is not as strong as it should be. She said, “Local businesses want dependable students and the CTE programs were not providing them.” She hired a new career development coordinator to make improvements to the program.

P1, P6, and P11 answered “yes” to Question 7. P1 said, “yes, they definitely are. When I am in those classes and see what those students are learning, I feel very strongly that they are learning those skills.” P11 tells his teachers all the time, “if we can teach kids to think critically and to use their minds, those will transfer into anything they do.” P6 agreed that students in the Project Lead the Way program were definitely learning those skills.

P6 and P11 answered “yes” to Question 8 that CTE outcomes were measured according to appropriate criteria. P6 and P11 said CTE post-assessments were guiding their answers. P11 said, “our high school is also trying to track students after graduation and follow up with them as much as possible.” P1 replied, “I am unsure if they have been measured appropriately since I am in my first year as principal.”

For Question 9, P1, P6, and P11 all agreed that CTE programs teach essential skills. P1 said, “one of my favorite things about CTE is that those classes are geared

toward teaching those skills.” P11 answered, “the critical thinking component is extremely important, as well as the teamwork skills.” P6 replied, “CTE teaches great team-building skills.”

P1, P6, and P11 answered “yes” to Question 10 that CTE classes mirror authenticity in the field. All three participants agreed that their teachers are doing a really good job of keeping up today on what is going on in the field. Business partners are visiting schools and meeting with teachers to develop strong programs, and teachers are touring businesses to stay up to date on the latest equipment and technology. P1 answered, “finding funds to equip CTE labs in schools can be a challenge.”

Research Question 3 Results

What is the overall effectiveness of the CTE experience in the school districts of three mountain counties of western North Carolina? Principals were asked to rate the CTE program within their high school on a scale from 1 to 5, with 1 being the lowest and 5 being the highest. Principals rated their program from a 3 to 4 and noted there is always room for improvement.

Weaknesses in the program identified by principals were funding and identifying community needs. P1, P6, and P11 responded said they all see weaknesses with their CTE programs. P1 replied, “funding sometimes limits things we want to do.” P6 stated, “they need to do a better job of identifying the needs of the community and figuring out exactly what it is we can do to address these needs.” P6 said, “finding qualified teachers in the CTE area can often be a challenge.”

Principals agreed their CTE programs worked to create meaningful ways to build skills, learn content, and get students thinking about their long-term career paths and

educational needs.

P1 responded by saying students have a really good sense of what they want to do and what steps do they need to take to be successful.

P6 stated they should know how to get out in the world and interact with people. They should know how to be able to take directions and follow directions. They need to be able to leave as young adults and know what is their next step.

P11 said students need to be able to function in a cooperative group. They need to show up for work, work hard, and be willing to learn and think. They need to have a positive attitude. They need to be critical thinkers and be willing and able to work with other people.

Table 4*CTE Director Responses*

Question	Yes	No	Unknown	Note
1. Is the program's or school's message to all students that CTE is a pathway into college and/or career?	3			
2. Does the CTE program prepare students for and offer a range of college credit-bearing dual enrollment and/or AP courses in science, computer science, math, and the like?	3			
3. Are the CTE program offerings a mix of the old trades (which now require sophisticated math and computer literacy) and high-growth fields, such as cybersecurity, health care, and engineering?	3			
4. Are CTE students' aspirations based on well-informed decisions, not demographics, and do they reflect the full spectrum of postsecondary options, including apprenticeship, certifications, Community College, 4-year institutions, and beyond?	2	1		
5. With which higher education institutions do the CTE program/school have partnerships?				*
6. Does the CTE program provide high-quality, work-based learning experiences supervised by employers and include time for learning from work?	3			
7. Are students learning transferable skills that will serve them well in the innovation economy?	3			
8. Are the outcomes of CTE measured according to appropriate criteria?	2	1		
9. Does the CTE program teach essential skills that include teamwork, critical thinking, and complex problem-solving skills that allow students to be successful for the rest of their life?	3			
10. How does the content being taught in CTE classes mirror authenticity in the field?	3			
11. What weaknesses do you see with the CTE programs being taught in the high schools?	3			
12. What essential skills are lacking from students to be Career and College Ready?				*
13. Does participation in CTE have an effect on student ability to be Career and College Ready?	3			
14. What is the overall effectiveness of the CTE experience within your school district?				*
15. What should high school CTE graduates know and be able to do?				*

Note. *Question 5: All participants knew their participating college institutions. Question 12: P2–Soft skills, confidence in acceptance, accepting criticism; P7–Responsibility, What is it? (employee, product, to the community); P12–Professional skills, getting to work on time, messaging. Question 14: P2–4; P7–5; P12–5. Question 15: P2–Identifying what they are good or not good at, advocating a plan for themselves; P7–The door to opportunity is just opening especially for concentrators; P12–Know how to function as a productive citizen.

Summary of CTE Director Interviews

For the purpose of reporting, the CTE director interview participants are identified as Participant 2 (P2), Participant 7 (P7), and Participant 12 (P12).

Research Question 1 Results

What effect does participation in CTE classes have on students and their ability to be career and college ready? All three CTE directors said “yes,” participation in CTE does have an effect on student abilities to be career and college ready.

P2, P7, and P12 answered “yes” to Questions 1-3 and agreed that the school’s message to all students is that CTE is a pathway into college and/or career. P7 stated, “CTE is definitely a pathway into college and or career. CTE is a place for students to experiment and look and see is this really a career I want to pursue.” P2 and P12 lean heavily on their college career coach to advise students on their pathways and through college and career placement courses and to show that every pathway leads into postsecondary training.

P2 responded “no” to Question 4, while P7 and P12 responded “yes.” P2 said he was working on it. He stated, “the biggest gap between the workforce and the students

was advisement.” The gap does not exist with CTE staff but with the academic core staff, because they advise students the way they were advised in high school. P12 responded that many student decisions are based on demographics. She stated that many CTE students were going into a program they can pursue in the county in which they live and in the surrounding region. CTE courses ensure that whatever courses students decide to take provide the transferable skills and the certifications needed for students to work anywhere they choose.

P2, P7, and P12 all have partnerships with various local community colleges, 4-year institutes, and trade schools. P7 noted that they have a college liaison who works with students to make the connection between the universities and the career pathway they have chosen.

When asked what essential skills were lacking to be career and college ready, they all agreed professional and employability skills were lacking. P2 referred to the soft skills and that students were lacking confidence, independence, and a willingness to accept constructive criticism. P12 referred to professional skills and that students had to learn to get to work on time and communicate with their employer. P12 answered, “There is such a gap between how professionals operate, and how the high school students are wanting to operate as a professional.” P7 believes that soft skills, hard skills, and essential skills have all come together to be employee ability skills. Students have to learn responsibility, and they use that responsibility as an employee in a product of the community.

P2, P7, and P12 all said “yes” to Question 13. P7 replied, “going through CTE programs exposes them more to the college and career ready expectation than any other thing they do.” P2 answered 100% yes; “it not only has an effect on them to be career and

college ready, but gives them opportunities for leadership, collaboration, and an opportunity to explore what lies beyond a small rural county.”

Themes that emerged from interviewing CTE directors were a heavy need for college career coaches and the gaps of advisement between CTE teachers and academic core staff. CTE directors all identified skills necessary to be career and college ready. Those skills needed were soft skills, responsibility, and professional skills.

Research Question 2 Results

Based on the perception of local employers, how well do the CTE programs of three mountain counties of western North Carolina prepare students for job and career readiness? CTE directors all agreed that without local business partnerships, they would not be able to offer a complete CTE program for their students. CTE directors recognize that business partnerships make sure students are engaged in real work experiences. Partnerships complement the skills students are building in the classroom. CTE directors believe in a shared vision with defined leadership on both sides. Partnerships serve to strengthen, support, and transform individual partners which results in improved program quality.

P2, P7, and P12 all agreed that CTE programs were providing high-quality, work-based learning experiences. Serving students in small rural counties does have its challenges with a smaller number of industries available as well as travel barriers to the employer and school. P12 was building a stronger support structure to secure internship placements that complete interviews with these students and place them accordingly. She said, “this would provide a more robust program.” P2, P7, and P12 were always working to improve community business partnerships to allow even more work-based learning

opportunities.

P2, P7, and P12 all agreed in Question 7 that their CTE programs are teaching transferable skills that will serve them well. P2 replied, “students are learning hands-on collaboration skills, communication skills, and the soft skills needed for employment.” P7 said, “they are teaching employability skills to students, so they are on time and show up to work. They are learning that it takes a good work ethic and teamwork ethic to be employable.” P12 noted that she was working diligently to offer all the available credentials in their CTE courses. She said, “There is a difference between transferable skills and industry-recognized credentials.” She believed students were learning the skills and her teachers were taking great pains to educate students on their skills and not just the content knowledge in the course.

P7 and P12 said CTE outcomes were being measured according to appropriate criteria. P12 answered, “The new comprehensive local needs assessment process has really helped with that being rewritten over reflective practices.” P7 replied, “based on the state goals and the federal indicators they were able to measure individual growth of the students who are meeting those standards.” P2 said, “no,” statewide they were not being measured appropriately and that the credentials being offered did not meet a lot of the needs in his rural community.

P2, P7, and P12 all said “yes” to Question 9 that essential skills are being taught. P2 stated, “These are the courses that students remember taking in high school and what brings value to something they learned in class and they can take with them, regardless of what their next steps may be.” P7 responded, “essential skills are the employability skills that the community is talking to the school system about and they are incorporating them

into what is being taught in the CTE classroom.” P12 said,

Essential skills are a cornerstone of CTE because the students consistently have to problem solve, team build, and use critical-thinking skills in each of their classes, and CTE courses are not just built to teach one piece of content; they’re taught to build a person.

P2, P7, and P12 answered “yes” to Question 10 that business partners and teachers worked together to build their programs. P12 replied, “it’s difficult.” The industry is updating continuously, and it is sometimes hard for teachers to catch up. Teachers must make sure they are in contact with their industry partners to make it an authentic field experience. P7 brought in his business partners and had a CTE business advisory meeting with his teachers. Teachers interviewed the business leaders to find out how they could make their classrooms more like the workplace and what equipment or program would be comparable so there is an easier bridge between classroom and work experience needed. P2 said “yes,” they were working on their CTE programs to have a definite connection between classroom and workplace. P12 said, “when people are matched up with community partners, that is when the magic happens for students, and it matches authenticity directly.”

Themes that emerged about business partnerships while conducting interviews were the challenges students face in small rural counties. Those challenges included transportation and the small number of available businesses where students could intern. Another challenge was the continuous industry updates in technology, machinery, and the resources to maintain those updates.

Research Question 3 Results

What is the overall effectiveness of the CTE experience in the school districts of three mountain counties of western North Carolina? CTE directors were asked to rate the CTE program within their high school on a scale from 1 to 5, with 1 being the lowest and 5 being the highest. CTE directors rated their program either a 4 or 5 and noted there was always room for growth.

P7 said, “when CTE students go through their programs it is not just taking courses. They are using their hands, they are using critical thinking, problem-solving skills, and being a part of the community.”

The weakness identified by CTE directors was having enough community business partners in a small rural setting. CTE directors agreed that development of CTE courses for lower grade levels and offering more credential opportunities will add value to their CTE programs. CTE directors agreed the effectiveness of their programs would be measured by what CTE graduates know and will be able to do.

P2, P7, and P12 all had similar responses to Question 15 as to what a CTE graduate should know. P2 replied, “they should be able to identify what they are good at, identify what they are not good at, be able to advocate for themselves, and a plan for how to move forward.” P7 thinks the one thing that is really important for CTE graduates to know, especially concentrators, is that the door to opportunity is just opening. P12 believes CTE graduates should be able to know how to function as productive citizens of our world. Specifically, for CTE, they should know how to look for what they want and prepare themselves for what they need.

Table 5*HR Director Responses*

Question	Yes	No	Unknown	Note
1. Is the program's or school's message to all students that CTE is a pathway into college and/or career?	9			
2. Does the CTE program prepare students for and offer a range of college credit-bearing dual enrollment and/or AP courses in science, computer science, math, and the like?	8		1	
3. Are the CTE program offerings a mix of the old trades (which now require sophisticated math and computer literacy) and high-growth fields, such as cybersecurity, health care, and engineering?	8		1	
4. Are CTE students' aspirations based on well-informed decisions, not demographics, and do they reflect the full spectrum of postsecondary options, including apprenticeship, certifications, Community College, 4-year institutions, and beyond?	8	1		
5. With which higher education institutions do the CTE program/school have partnerships?				*
6. Does the CTE program provide high-quality, work-based learning experiences supervised by employers and include time for learning from work?	9			
7. Are students learning transferable skills that will serve them well in the innovation economy?	8	1		
8. Are the outcomes of CTE measured according to appropriate criteria?	5		4	
9. Does the CTE program teach essential skills that include teamwork, critical thinking, and complex problem-solving skills that allow students to be successful for the rest of their life?	7	2		
10. How does the content being taught in CTE classes mirror authenticity in the field?	8			*
11. What weaknesses do you see with the CTE programs being taught in the high schools?	8	1		
12. What essential skills are lacking from students to be Career and College Ready?				*
13. Does participation in CTE have an effect on student ability to be Career and College Ready?	9			
14. What is the overall effectiveness of the CTE experience within your school district?				*
15. What should high school CTE graduates know and be able to do?				*

Note. *Question 5: All participants knew their participating college institutions. Question 10: P3–It depends on the instructor and oversight of the program. Question 12: P3–Critical thinking, personal accountability, maturity, conflict resolution; P4–communication skills; P5–basic life skills, social environment; P8–Communication skills, people skills, learning traits on the job, need to be acceptable, critical-thinking skills, culture of business; P9–critical-thinking skills, patience; P10–basic life skills; P13 conflict resolution, communication, what is appropriate and not appropriate in the workplace; P14–communication skills; P15–commitment. Question 14: P3–3; P4–3-4; P5–3; P8–3-4; P9–Not qualified, not sure; P10–4; P13–4; P14–5; P15–5. Question 15: P3–Have the opportunity to explore more pathways, articulate responses; P4–have students come out of high school prepared for what they face, communication and trade skills; P5–life skills (writing a check, accounting skills, certifications); P8–transferable skills, communication skills teamwork, being adaptable, learning all the add on jobs that go with working at a job; P9–Need to know and develop an interest that you are not a failure if you do not go to a 4-year school, the earlier students develop an interest in trade the longer and more productive they will be, obtain a salary and add value; P10–knowing a vision of what the student wants and prepare a solid foundation, make sure students stay on track; P13–a basic understanding of the core competencies and basic understanding of the workforce, willingness to learn and grow in the field; P14–being able to take skills they have learned and go get a job in skills they have learned can expand those skills in a college; P15–basic fundamental skills that they can transfer into the workforce (commitment and confidence in those skills), being able to communicate and work in teams.

Summary of HR Director Interviews

Research Question 1 Results

What effect does participation in CTE have on students and their ability to be career and college ready? For reporting, the HR director interview participants are identified as Participant 3 (P3), Participant 4 (P4), Participant 5 (P5), Participant 8 (P8), Participant 9 (P9), Participant 10 (P10), Participant 13 (P13), Participant 14 (P14), and Participant 15 (P15).

All nine HR directors said, “yes,” participation in CTE does have an effect on student abilities to be career and college ready.

P3, P4, P5, P8, P9, P10, P13, P14, and P15 answered “yes” and believed participation in CTE affects a student’s ability to be career and college ready. P15 stated, “participation in CTE gives students an ability for a future career, wherever they’re going.”

HR directors value the CTE programs within the school system and recognize that their organization will vie for the talent of students graduating from CTE programs. Interviewed HR directors recognized the need for employee-oriented workplaces and CTE programs that meet the needs of future employees for meaningful work. HR directors also recognized the potential for growth and the need for strong support and communication for their partnerships with local school systems. All but one HR director agreed that CTE is a pathway into college and/or career.

P4, P5, P8, P9, P10, P13, P14, and P15 all answered “yes” and agreed with the school’s message to all students that CTE is a pathway into college and/or career. P3 answered “no” to Question 1 and said,

I do not think that message is clearly expressed to the students involved. But I think at times, people can get stuck in the pathways and lose the ability to explore different options as their maturity develops and their interests evolve over time. And that can be damaging to the overall experience and the connectivity between employment organizations and the students themselves.

P3, P5, P9, P10, P13, P14, and P15 agreed CTE programs prepare students for and offer a range of college credit-bearing dual enrollment opportunities. P15 thinks CTE is invaluable and that all students should take some form of classes to prepare, whether it be a college pathway or even if they are going straight into a career. P4 and P8 were unsure if those types of classes were offered. P8 did say, “any of those classes that were taken is an advantage to employers.” She also said, “employers need students to understand how much they need writing and higher math skills, no matter what industry or field they go into.” P4 was also unsure about programs being offered but believed students were graduating with an associate’s degree or close to having an associate’s degree.

For Question 3, P3 answered she honestly did not know. P4, P5, P8, P9, P10, P13, P14, and P15 all answered “yes.” P13 said, “I think our CTE programs are doing a fantastic job in partnering with the community college to offer a broader list of potential trades. Many times, it is based on the area's needs.” All HR directors stressed the need for programs that offered a mix of the old trades as well as high growth fields and building strong relationships with the local high schools and community colleges.

P4, P5, P8, P9, P10, P13, P14, and P15 said “yes,” student aspirations are being based on well-informed decisions. P3 answered “no” to Question 4 and said, “I actually

do not think they do a good job on that.” She said culturally, programs themselves tend to lend themselves that there is only one pathway and that is a 4-year university. She thought they could do a better job. P9 agreed that there is a very intense focus in high school on what options are available for students and they are based on well-informed decisions. He thought there is a sincere intent to educate students about what decisions they may have and what the CTE programs can offer. P9 answered, “everyone does not need a 4-year degree.” P13 replied, “students are well informed from the beginning of their freshman year in high school and there is a tremendous amount toward educating parents.” P10 agreed that the majority of CTE students make well-informed decisions because the CTE teachers and advisors are very good at explaining student options. P15 thought there was a mixture based on your upbringing in a rural location and what your parents’ or grandparents’ occupations were. P15 did say, “the administration and CTE department at the high school do a really good job of laying out options to students.”

Question 5 asked HR directors if they knew which higher education institutions had partnerships with the CTE program in high school. P3 did not know of any partnerships with higher education institutions. P4, P5, P8, P9, P10, P13, P14, and P15 were all able to list partnerships with the local community colleges and 4-year institutions.

P3, P4, P5, P8, P9, P10, P13, P14, and P15 all listed essential skills students lacked to be career and college ready. Essential skills employers said students are lacking include critical thinking, personal accountability, maturity, conflict resolution, communication skills, basic life skills, people skills, social skills—what is appropriate and not appropriate in the workplace—and commitment.

Identifying essential skills students need to be career and college ready is built on communication, effective leadership, and collaboration between business partners and schools.

Research Question 2 Results

Based on the perception of local employers, how well do the CTE programs of three mountain counties of western North Carolina prepare students for job and career readiness? All HR directors interviewed agreed that partnering with public schools helps create a number of mentally beneficial advantages for each party. Local businesses are helping to create a local workforce that supports schools by offering internships and job shadowing opportunities. They are helping create and produce a better-educated workforce. Students receiving hands-on, real-world work experiences gain a better understanding of the specific skills needed to enter the workforce following graduation.

P4, P5, P8, P9, P10, P13, P14, and P15 all agreed to Question 6 and said “yes,” the CTE programs were providing high-quality, work-based learning experiences and they were all involved with the process. P10 said, “students learn a lot from working side-by-side with an employee and receive encouragement to continue with what they are learning.” P9 said, “Absolutely, that is one of the main focuses that gives real-time experience to students.” P8 thought the internship program was great. She felt her industry was falling a little short because students were getting exposure and learning the trade but not exposure on how to actually run the business.

P4, P5, P9, P10, P13, P14, and P15 all agreed students were learning transferable skills. P9 thought this was the main focus and intent of the CTE program; students were

learning skills that added value immediately to the industry or company they were coming to serve. P14 agreed students were acquiring skills they can use immediately. P15 said, “absolutely and it helps build the workforce locally.” P3 was unsure about Question 7. She often found younger employees, whether recent high school or college graduates, very ill-equipped for a genuine work environment. The gaps she identified are often in personal responsibility, accountability, and follow-through. There tends to be a pretty significant gap in maturity. She did not believe that at either the high school level or oftentimes the collegiate level, students were being equipped appropriately for the work environment. P8 thought the biggest transferable skills schools were falling short on were the people skills and the people skills students are lacking in technology.

P4, P5, P10, P14, and P15 all agreed that the outcomes of CTE were measured according to appropriate criteria. P14 stated, “I do not think any standardized test can measure CTE outcomes, but I do see students have success in CTE-type fields.” P3, P8, P9, and P13 were unsure or did not know if criteria were measured appropriately. P3 did not know because she did not know the metrics that are used. She believed employment status like long-term employment status is not a metric and it should be.

P4, P5, P9, P10, P13, P14, and P15 said “yes” to Question 9 that essential skills were being taught in the CTE program. P13 agreed that essential skills were being taught but are probably not as well developed as we apply them today. P10 agreed that CTE gives the students the opportunities to think for themselves and also work together as a team. P4 believes CTE teaches students how to communicate with people and how to negotiate. P4 stated, “CTE really builds essential skills more than the core classes.” P3 answered “no,” and there does not appear to be a lot of critical-thinking development and

teamwork. She thought there was more focus just on busywork. P8 was unsure and thought that was an area in which we can greatly improve.

P4, P5, P8, P9, P10, P13, P14, and P15 all agreed that the content being taught in CTE mirrors authenticity in the field. P3 agreed some factors went into her answer. She replied, “it depends on the instructor and the oversight at the program.” P4 responded, “the quality of your education is a big factor”; not just their skill at being an educator but their life experience. If the instructor has been in the field and sees how it works, they are more qualified to teach those classes. P14 stated, “yes, if you have a strong teacher teaching it.” P15 answered, “the CTE teachers build strong relationships with students because they teach them multiple times during their high school experience by taking advanced levels at each grade.” P9 replied, “the more industry and business support you have, the stronger the content.” P15 agreed that the stronger the teacher, the stronger the program is. Communication between industry leaders and educators had to be ongoing.

Major themes that emerged while interviewing HR directors were the need for a strongly qualified instructor, continuous communication between industry leaders and educators, and the need for added value of essential skills being taught in the classroom.

Research Question 3 Results

What is the overall effectiveness of the CTE experience in the school districts of three mountain counties of western North Carolina? HR directors were asked to rate the CTE program within their high school on a scale from 1 to 5, with 1 being the lowest and 5 being the highest. HR directors rated their program from 3 to 5. All were excited about the opportunity to grow and improve the program.

P9 did not feel qualified to rate the program because he was in his first year in the

HR position. He has been in communication about the program and is excited about the opportunities to serve the school system and the community.

All HR directors identified opportunities for growth to improve the program. P3, P4, P5, P8, P9, P10, P13, and P15 all said that they did see weaknesses with the CTE program. P13 stated, “students are not prepared for how to enter the professional setting. They may have the skillset, but they do not know how to translate the skill set into a professional environment.” When asked to expand on weaknesses, I received many responses. Responses included getting qualified teachers, business and industry support, being in a rural area, the community, communicating with professionals in the community, and personal skills. P14 saw no weaknesses with the CTE programs being taught but said, “funding is always an issue.”

All HR directors were pleased with the CTE programs within their school and agreed their effectiveness as a business partner would help the CTE students grow and develop the skills they needed as a graduate. HR directors gave their view of what a high school CTE graduate should know.

In response to Question 15, P3 said students should have the opportunity to explore more pathways and articulate responses. P4 answered that students should come out of high school prepared for what they face. They also need communication and trade skills. P5 responded by saying students need life skills such as writing a check, accounting skills, and CTE certifications. P8 stated that students needed transferable skills, communication skills, teamwork skills, to be adaptable, and to learn all the add-on jobs that go with working at a job. P9 said students need to know and develop an interest and that they are not a failure if they do not go to a 4-year school, obtain a salary, and add

value to their community. P10 answered students should have a vision of what they want and prepare a solid foundation while in school. P13 said students need a basic understanding of the core competencies and a basic understanding of the workforce with a willingness to learn and grow in the field. P14 stated that students must be able to take skills they have learned and expand those skills in college. P15 responded that students need basic fundamental skills that they can transfer into the workforce. P15 also said students need commitment and confidence in their skills while being able to communicate and work in teams.

Summary of Individual Interviews

My study investigated the impact of CTE in determining the skills gap in selected rural communities in North Carolina. Participants who took part in individual interviews were asked a series of questions to collect data on the CTE program within their community. Participants identified strengths and weaknesses of their CTE programs and their effect on student abilities to be career and college ready. Participants also identified employer perceptions of how well the CTE program prepared students for job and career readiness as well as the effectiveness of the CTE program. Participants who took part in these individual interviews reiterated themes found during the interview process. Specifically, they discussed the importance of Career and College Promise, business partnerships, work-based learning opportunities, highly qualified teachers, and essential skills.

They identified specific areas of needs such as additional resources, developing stronger soft and hard skills for students, and the need for students to take advanced level classes in computer sciences, math, and college-credit bearing dual enrollment courses.

Conclusion

This chapter presented the findings from a case study centered on examining the perceptions of high school principals, CTE directors, and HR directors of how well their CTE programs are performing within their small rural communities. In the next chapter, these findings are analyzed.

Chapter 5: Discussion

Overview

The skills gap is well documented. Wagner (2008) interviewed CEOs and representatives of major U.S. companies and identified seven skills that are essential for success in the workforce: critical thinking and problem-solving, collaboration across networks and leading by influence, agility and adaptability, initiative and entrepreneurialism, effective oral and written communication, accessing and analyzing information, and curiosity and imagination.

Critical thinking encourages students to research and favor objective logic over their initial emotional response. A critical thinker does not only accumulate information well, but they also know how to use the information and deduce important facts and outcomes. By conceptualizing outcomes, critical thinkers are better at problem-solving. Because of this fact, employers value critical thinking, especially in roles where preparing strategy is essential.

This study indicated that collaboration in the workplace involves individuals working together to solve problems. Participants agreed that working in teams enables employees to share knowledge and work more efficiently and effectively. Working together in teams promotes healthy employee relationships, and healthy employee relationships lead to better team performance and overall productivity.

Initiative and entrepreneurialism involve creativity, innovation, and risk-taking, as well as the ability to plan and manage projects in order to achieve objectives. Initiative brings in new ideas to generate more business. Participants wanted students who can take charge. Participants wanted students to have a personal quality that shows a willingness

to get things done and take responsibility. Employers need employees who have a willingness to ask questions and share ideas.

This study showed that employees needed good verbal and written communication skills to deliver and understand information quickly and accurately. Being able to communicate effectively is a vital life skill and should not be overlooked. Participants believed students participating in CTE courses developed communication skills in group projects through the collaboration with team members to deliver a desired outcome. Communication skills were also developed by listening in class, answering questions, and presenting projects through oral presentations. Communication helps to deepen connections with others and improve teamwork, decision-making, and problem-solving.

Employers agreed that students with the ability to access and analyze information were able to access the quality and relevance of information; evaluate the argument of others; identify the relevance and importance of ideas; and manage conflicting, inadequate, or ambiguous information.

This study demonstrated that employers need workers who are curious with a strong desire to learn or know something. Curiosity leads to the imagination process of forming ideas of concepts and producing creations and projects. Students who possessed these skills were able to be creative, innovative, and forward thinking. An imaginative student is free to take risks and be a leader and to state opinions rather than just correct answers. Participants agreed that imagination aids in the development of social, emotional, creative, and problem-solving skills needed for the 21st century.

Chapter 5 provides an analysis and discussion of the study's findings and

conclusions. Implications of the findings and limitations are also included. The study added to the body of research pertaining to the advantages of CTE and the perception of skills being taught for students to be career and college ready.

Studies have shown that students who enroll in CTE courses are more likely to graduate from high school, acquire employability skills, and increase their earning potential. Schargel and Smink (2001) identified five potential benefits for students who take CTE courses: enhancement of student motivational and academic achievement, increased personal and social competence related to work in general, a broad understanding of an occupation or industry, career exploration and planning, and acquisition of knowledge or skills related to employment.

Purpose

The purpose of the study was to determine the impact of participation in CTE in determining the skills gap in selected rural communities. The guiding question for the study was, “What are the perceptions and views of the CTE program within your county from the high school principal, CTE director, and HR directors who hire and employ CTE graduates”; specifically,

1. What effect does participation in CTE classes have on students and their ability to be career and college ready?
2. Based on the perception of local employers, how well did the CTE programs of three mountain counties of western North Carolina prepare students for job and career readiness?
3. What is the overall effectiveness of the CTE experience in the school districts of three mountain counties of western North Carolina?

Analysis of Findings

Research Question 1

What effect does participation in CTE classes have on students and their ability to be career and college ready? In North Carolina, students are considered career and college ready when they have the knowledge and academic preparation needed to enroll and succeed in introductory college credit-bearing courses in English language arts and mathematics within an associate or baccalaureate degree program. These same attributes and levels of achievement are needed for entry into and success in postsecondary workforce education, the military, or a job that offers gainful employment and career advancement (The Hunt Institute, 2015).

All North Carolina students should graduate from high school ready for the demands of a chosen career and college pathway to a career. To answer Research Question 1, data gathered from participant interviews were analyzed on how they responded to a series of questions to determine if students were graduating career and college ready. All the interview participants agreed that participation in CTE does have an effect on student abilities to be career and college ready.

Through this study, I was able to show that career readiness education is critical in schools because it prepares students for life after college as they begin their careers, equipping them with the skills necessary to navigate the work force. When students are career and college ready, they have the knowledge, skills, and dispositions needed to be successful in postsecondary education and/or training that leads to gainful employment.

All participants know and understand how CTE programs benefit high school students with many variables contributing to their responses. These variables were

college credit dual enrollment courses. Career and College Promise is North Carolina's dual enrollment program for high school students. This program allows eligible North Carolina high school students to enroll in college classes at North Carolina community colleges and universities through their high school. Students who successfully complete college courses earn college credit they can take with them after graduation. In many cases, students can also earn dual credit, meeting high school graduation requirements with college courses. For students interested in technical careers and postsecondary education, the courses they encounter as part of a Career and College Promise pathway will align closely with the level of work that will be expected of them after finishing high school. Walter Bumphus, President of American Association of Community Colleges, said,

Your best workforce resource may be your local community college. As colleges reimagine their roles for the 21st century, they are committing to work with business and industry to provide trained and adaptable talent. We encourage companies to work with their community college partners to develop programs and pipelines that meet their current and future needs. (*Partnering With Community Colleges*, n.d., para. 2)

North Carolina community colleges offer many CTE course offerings in various career pathways. CTE opportunities vary from one community college to another. CTE allows students to begin a certification or diploma program in a particular field or career area. All CTE programs from the study have strong business and community partnerships. Each participant agreed that they have an active and collaborative working relationship that allows students to explore career opportunities within those business

partnerships. These work-based learning opportunities are supervised by employers and include time for learning from work. Working directly with prospective employers provides students with a greater incentive to do well in school and helps them understand the relevance of the work they are doing. Students working in activities with employers learn about careers and career pathways while working with real people. All participants agreed that students working in employer-connected initiatives get a head start on employability skills, job-specific skills, and networking with future employers. Currently, there is no research available to show a negative impact on student performance for employer involvement with students.

Implementing an internship program can greatly assist employers in fulfilling long-term talent acquisition and effective workforce planning. Employers are increasingly focusing on hiring employees with relevant internship experience. These employers believe they will be a better fit for their companies by being better prepared and more committed. Using the results from this study, CTE directors and internship coordinators will be able to recruit new community business partners. The first step in the process is for businesses to communicate with the school system the internal needs of their company or organization. The second step is developing a good job description that will attract the best candidates. The third step to attract more businesses is through career fairs, social media, and engaging in student organizations. Fourth, the success of the internship depends on a good match between the company and the intern. The selection process for interns should closely resemble the company's process for hiring regular employees. Finally, a formal intern orientation, mentoring system, and evaluation process are vital parts of the internship. Building relationships with employers helps to maintain a

pipeline of skilled talent for future recruitment.

Research Question 2

Based on the perception of local employers, how well did the CTE programs of three mountain counties of western North Carolina prepare students for job and career readiness? To answer Research Question 2, data gathered from HR director participant interviews were analyzed on how they responded to a series of questions to determine how well the CTE program was performing in their district.

One determining question was a rating scale of the overall effectiveness of the CTE experience within their school district. Participants were asked to rate the effectiveness on a scale from 1 to 5, with 1 being the lowest and 5 being the highest. Answers varied from a rating of 3 to 5. All participants agreed there was always room for growth and gave examples for their rating of the program.

One major contributing factor was the quality of the instructor and the oversight of the program. School leadership is second only to teaching among school-related factors in its impact on student learning (Grissom et al., 2021). High-quality teaching is strongly shaped by the principal and is the prime factor in determining whether teachers stay in high-need schools. High-quality principal leadership is vital to the effectiveness of our public schools, especially those serving the children who are disadvantaged in life (Grissom et al., 2021). Because many schools and school systems across the state are struggling to find highly qualified teachers, North Carolina needs to continue its efforts to help recruit and retain highly qualified teachers. North Carolina has a multifaceted problem of teacher shortage and distribution. To ensure the equitable distribution of teachers, North Carolina must increase the overall supply of teachers available to schools.

The North Carolina Department of Public Instruction must focus efforts on increasing public awareness of the problem, recruiting teachers to our schools, and retaining the teachers in our schools. The state must also find ways to enhance the effectiveness of our current supply of CTE teachers to ensure that all students are provided quality instruction. The value of CTE teachers today cannot be overstated. Many participants agreed that CTE educators prepare youth for high-tech, futuristic careers; help close the current skills gap in industries; improve economies through higher returns on investment in education; and save students and families thousands of dollars in tuition by providing practical skills designed for the real world.

Another contributing factor for how programs were rated was based on the concept of being in a rural setting. Rural schools face unique and complex challenges. Funding disparities between rural and urban communities mean fewer resources and opportunities for rural students. Because students in the rural districts tend to be spread out over a large geographical area, transportation tends to be an issue. Students in rural schools have access to fewer advanced classes than urban students. Most rural schools have smaller teaching staff due to funding issues. Teachers at rural schools often have lower salaries and additional roles and responsibilities and face professional isolation which leads to a higher teacher turnover rate. The most common obstacle in rural settings is the lack of industry to provide adequate opportunities for student work-based learning opportunities.

Before the COVID-19 pandemic, CTE classes relied more on hands-on instruction, equipment, and fieldwork. “For many—if not most—CTE programs, at least some face to face instruction is ideal, or even necessary, for knowledge and skill

development and hands on practice” (Castelo, 2020, p. 2), according to the ACTE recent brief on planning high-quality CTE for a pandemic-impacted school year.

Bringing CTE programs into a virtual environment does offer long-term benefits. Online programs offer flexibility. Students can stay engaged in their learning and extend what they learn in the classroom with interactive opportunities they participate in at home. “Bringing CTE programs into a digital ecosystem can help students develop 21st century skills needed for workplace success” (Castelo, 2020, p. 2), stated Cliff Archery, Senior Program Manager for Education at IBM. Archery said, “Districts may not have the resources to spend on things that some may consider non-core” (Castelo, 2020, p. 3). Archery stated, “That means schools are going to have to find resources that are affordable, low weight in terms of the implementation ramp-up and accessible for both students and teachers” (Castelo, 2020, p. 3).

In small rural counties, teachers could continue teaching CTE virtually by having combined videoconferencing technology, video recording, and at-home student projects to teach concepts, prepare students for certifications exams, and provide a semblance of hands-on learning through synchronous and asynchronous instruction. Educators could also use augmented and virtual reality for lab simulations to practice their soft skills and explore a variety of career pathways (Castelo, 2020).

Communicating and building partnerships with the local school system was another contributing factor to how participants rated the school systems. All CTE programs are now required to have a CTE advisory committee. This committee is a group of individuals with a common interest in a particular CTE area. These areas of interest range from business, manufacturing, agricultural, construction, education, and training.

This group is made up of local businesses and community professionals, teachers, students, administrators, and parents. The purpose of the advisory committee is to support educators, students, and businesses in developing, establishing, and evaluating CTE programs to ensure students are well prepared for the world of work.

The advisory committee supports the CTE program by advising educators and students as to the skills, knowledge, tools, technology, and tasks needed in today's careers. They can share information about education, conferences, workshops, visits to local businesses, equipment, curriculum, safety, resumes, and interview skills for a particular career.

Advisory committee members advocate sustaining local CTE programs in their schools. They can meet with school administration to stress the importance of the skills and knowledge students gain in CTE programs. Advisory members can support teachers and students through the meetings; networking events; and donations of equipment, tools, or supplies that would benefit students as they learn the skills and knowledge needed for a particular career. Participating in CTE student organization competitions, meetings, or events as well as visiting classrooms would also support students in their career paths.

Many of the participants interviewed either served on their local advisory committee or their regional advisory committee. They believed it is essential to the future success of the students as well as the workforce. Through these committees, they were able to share their expertise and ever-changing knowledge and skills needed in the world of work. While serving on these committees, they became strong advocates for sustaining local CTE programs. They were able to advise educators and students as to the skills, knowledge, tools, technology, and tasks needed in today's careers. All participants agreed

that communication between industry leaders and educators had to be ongoing for a successful and sustainable CTE program.

Research Question 3

What is the overall effectiveness of the CTE experience in the school districts of three mountain counties of western North Carolina? To answer Research Question 3, data gathered from all participant interviews were analyzed on how they responded to a series of questions to determine the overall effectiveness of the CTE experience. The overall effectiveness was scored on a scale from 1 to 5, with 1 being the lowest and 5 being the highest. Participant ratings ranged from 3 to 5.

All participants agreed the CTE programs in their counties were providing important pathways to success for high school students and offered each student opportunities to personalize their education based on their career interests and unique learning needs. Each district had different opportunities to offer courses and programs designed to prepare students for careers in current or emerging professions. Each high school provided CTE students with opportunities to explore a career theme of interest while learning a set of technical and employability skills that integrate into or complement their academic studies. Each school system had partnerships with higher institutes of learning which brought about a connection with and led to postsecondary programs of study or additional training after high school. Every CTE program had business partnerships with local employers and community members.

Through these partnerships, CTE students are afforded many opportunities for success. These partnerships have opportunities available through work-based learning, Career and College Promise, advanced AP courses in CTE, certification, transferable

skills, knowledge of all aspects of an industry, and essential skills. CTE provides an important avenue for young adults to use these opportunities and to gain these skills beginning in high school.

Each participant agreed that students should graduate from high school ready for college, careers, and life, prepared to pursue the future of their choosing. Many of these skills a career and college ready graduate has obtained are through academics. The skills most demanded by colleges and employers are by design and are inherent in a rigorous K-12 education. Both employers and school personnel participants agreed that students must have the ability to communicate effectively (both verbally and in written communication), solve problems, think critically, and develop informed arguments.

Making learning relevant to the real world helps students form important connections. Business and industry are addressing these skills by providing work-based learning opportunities for students to learn hands-on interpersonal skills. These work-based learning opportunities are beneficial to help strengthen these skills to provide a greater door to opportunity.

School personnel are addressing this issue through the curriculum taught in the CTE classroom. Teachers are bringing in guest speakers to talk in the classroom about the importance of soft skills in their profession. Teachers are giving students a time to reflect. If they are working in a group, they are developing the ability to work as a team. Teachers are having them reflect on and write about what it is like working on a team. Teachers are creating responsibility in their classroom and holding students accountable for their actions. Participants agree that no matter what class is being taught, students need to show up on time prepared and ready to listen and participate.

Students need to be able to analyze information and data; collaborate, communicate, and present information; and use research to make informed judgments. These are all critical skills that impact the success of CTE programs.

All participants agreed that their CTE programs were providing opportunities for students to be career and college ready. They all had concerns that students were lacking some of the essential skills to be college and career ready. Each participant had different accounts of the skills in which students were deficient. Participants agreed all students needed to demonstrate personal accountability for their actions and work habits. Participants expressed the need for students to show up on time, work productively with others, and understand the impact of their nonverbal communication. They wanted all students to take responsibility and learn from their mistakes to show integrity and ethical behavior.

To become career ready, students need both the knowledge and skills necessary for employment in their desired occupation; therefore, career readiness begins with college readiness. Students need to navigate the pathways that connect education and employment to achieve a fulfilling and rewarding career.

Implications

The findings from the study, grounded in three rural communities in western North Carolina, may contribute to the overall development of improved CTE programs within each district. This research highlights areas of CTE programs that high school principals, CTE directors, and HR directors perceive are most and least effective. Additionally, the results may allow school districts, institutes of higher education, and local business leaders to identify and address specific needs CTE students must have to

be career and college ready. The themes surrounding the challenges of rural CTE programs were found in the study results: increase funding for CTE programs, strategies to attract and retain highly qualified CTE instructors, increased work-based learning opportunities, and increased opportunities for mastery of knowledge and skills in core academic disciplines. The findings of the study also suggest a need for school districts and local employers to identify essential skills students are lacking to be career and college ready and to develop more opportunities for students to learn those skills through community college and local business partnerships.

The CTE framework model in Figure 2 indicated four contributing outcomes of CTE programs: high school graduation, college readiness, technical skill proficiency, and postsecondary credentials. All four of these factors have been shown to influence student abilities to be career and college ready in prior research. As CTE grows to occupy a larger share of the education policy conversation, it is important to consider what we know about the efficacy and impact of CTE to inform changes in policy and practice. This includes being deliberate in our approach to measuring student CTE experiences and specifying the outcomes we expect to be most responsive (Wilkie, 2019; Wolf, 2018).

The CTE research network shows that measuring CTE outcomes will be enhanced through a program that is progressive and a non-duplicative sequence of rigorous academic and technical coursework. The program should be organized within a single industry cluster and pathway aligned with state or regional industry needs. Programs are intended to span the secondary and postsecondary education levels; provide for multiple entry and exit points that incorporate credentialing; and culminate in the reward of an industry recognized credential, an associate's degree, or a bachelor's degree (Dougherty

et al., 2020). This study's results show that participation in CTE programs had a positive impact on the abilities of students to be both career and college ready.

The study provided compelling evidence for high school principals and CTE directors to advocate for advanced CTE programs, not just for the intrinsic values to the students and the school, but because participation in CTE can be seen as a contributor and not a distraction to student achievement. For school systems struggling to close the achievement gap and have a positive effect on student outcomes, there is evidence in the study that supports the idea that CTE is related positively for most students who participate in CTE courses.

Figure 2 shows the choice high school students have of three different pathways: general, academic, or CTE. Findings from my study indicate that when students are enrolled in a CTE career pathway, they achieve better when there is an increase in academic course taking within a curriculum integration framework and when they are placed in smaller learning communities that have well-defined career pathways. When high school students enroll in postsecondary dual enrollment classes, it leads to a higher probability of receiving a postsecondary credential. CTE students who take math earlier in their course of study are assured higher odds of graduation. By taking advantage of dual-enrollment and math courses, CTE students have a greater chance of higher skill levels and greater success of graduating from college. Value-added wage earnings are at the highest when CTE students complete any type of credential.

Recommendations for Improvement

Clearly, CTE is an important catalyst for improving the skills gap for students to be career and college ready. Through close examination and investigation, this study has

identified some gaps in which CTE programs in rural communities may be improved. Opportunities exist for local school districts and employers to collaborate to improve the overall quality of their CTE programs. The following recommendations are intended to improve the CTE programs of rural school districts.

Findings from this study may indicate the need to improve funding for CTE programs to provide the most equitable learning opportunities for students and CTE programs. Many existing state funding structures for CTE reflect the belief that CTE courses are more expensive to implement than general education courses without accounting for the value of various CTE programs or student outcomes.

One way to increase funding would be to apply for competitive grants to districts interested in improving or expanding their CTE programs. These grants would be recurring funds or one-time budget allocations intended to offset start-up or program transition costs. These grants could encourage innovation and high performance. These funds could come from the Perkins V reserve funds set aside to prioritize high value CTE programs of study and professional development to recruit or retain teachers to offer these programs.

Perkins V offers greater flexibility than prior laws. States are able to set aside 15% of their allocation for a reserve fund, which can be used to address their specific needs. The reserve fund must be used to foster innovation and promote programs of study or career pathways that align with the priorities of the state in rural areas or areas with gaps in performance (Leveraging Use of the Reserve Fund, n.d.).

Many school districts use local funds they acquire from local county government to support their CTE programs. Request from the school superintendent for additional

funds to support CTE could be made during the yearly budget request for the school system. Additionally, through partnerships from local businesses, community organizations, and foundations for CTE programs, funds could be increased to support the local CTE programs. Local and private funds are the most flexible funding source and could generate the highest impact.

Findings from this study indicate a need to attract and retain highly qualified teachers. Many teachers are motivated by a desire to perform well. Altruism alone is not enough to attract high-ability candidates to the profession and keep them in the classroom. Research shows that teachers would remain in education or return to the profession if they were able to maintain retirement benefits, salary increases, student loan forgiveness, and housing incentives. In addition, working conditions, such as smaller class sizes/student loads, appear important to teacher decisions (Carver-Thomas & Darling-Hammond, 2019).

The extent to which potential teachers choose to enter and stay in teaching is highly influenced by the availability of better and higher paying jobs. Developing an incentive plan for additional funding for teachers could help not only in recruitment but also in retention. Teachers can earn additional pay when students earn industry certifications.

Recruiting teachers can begin within one's own school district. School systems could begin an early advisement program with their career development coordinator in middle school to begin recruiting possible teacher candidates for the school system. As students complete career exploration opportunities, counselors and teachers can begin recruiting students who have an interest or desire to be a teacher. By expanding the

teacher cadet program in high school, these students could be placed in a career pathway for education. Students and parents could be advised of opportunities available for employment after graduation. While collaborating with the local community college, students could begin the educational pathway through dual enrollment classes that would earn them requirements for high school graduation as well as college requirements. Students could then attend higher institutes of learning with almost 2 years of education tuition free.

An opportunity exists for local districts to improve the retention and overall quality of highly qualified teachers. One way school districts can create systematic improvement is by creating a district CTE leadership academy. The CTE leadership academy could involve CTE teachers, career counselors, and school administrators. The academy would offer an intensive hands-on approach to master critical analytical and communication skills, policy, and best practices that dramatically improve high-quality CTE opportunities for teachers, students, and school districts. Participants would graduate with a deeper understanding of how to create a program vision, fund high-quality pathways and critical industry partnerships, develop community support, and engage fellow educators.

Findings from the study also indicate the need to expand work-based learning opportunities for students. When done well, work-based learning provides young people with meaningful exposure to workers, job duties, and workplaces and offers opportunities to learn occupational and employability skills in ways that are difficult to achieve in the classroom alone (Ross et al., 2020). Developing high-quality virtual work-based learning opportunities and experiences could provide students with best practice informed

guidance that can support not only students but also employers all across the state.

Through local, regional, and state CTE advisory boards, employers could develop virtual work-based learning opportunities that would be designed to offer virtual learning experiences that are beneficial to students in rural communities where students face transportation issues and a limited number of available businesses. These virtual experiences could also be beneficial for designing hybrid internships as well as in-person programs.

Technology holds the potential to expand work-based learning opportunities for all learners, bringing more cohesion to youth pathways from elementary school through their postsecondary lives and into the labor market. Technology could be used in the development of many work-based learning opportunities that could benefit students. Technology could allow for real-time or recorded interactions between students and industry. Online programs of micro credentialing would allow students to gain and demonstrate skill-specific proficiency when applying for a job or college. Virtual field trips could become more available which would also expand and include more work-based learning experiences. These new innovative technologies would give students living in communities with limited access to a career environment a place where they could interact with colleagues, make decisions, and practice specific job skills. Because of the digital nature, they could receive feedback and repeat scenarios multiple times to develop more competency and fluency.

The findings of the study recognized the need to increase opportunities for mastery of knowledge and skills in core academic disciplines. The world is changing at an unprecedented rate, so much so that jobs that existed for decades are disappearing by

the day. That means educators are responsible for equipping our students with the skills they need to thrive in the employment market they will be entering (Mugabi, 2020).

Harvard professor Chris Dede tells us that as educators, we can improve those skills in the classroom by arranging lessons and activities so the teacher is talking as little as possible (Pole, 2020). Comparison and categorization activities are two simple yet effective ways to practice critical-thinking skills. Another way to encourage critical thinking is to ask students lots of hypothetical questions to engage their imagination. Holding group activities is the most natural way to build collaboration and teamwork. Building these skills helps make students more cooperative, brings out their curiosity, and increases their motivation to learn more, producing lifelong learners in the process (Pole, 2020).

Employers and educators from the study listed critical thinking and problem-solving, innovation, creativity, learning to learn, and self-awareness and direction for improvement as the knowledge and skills in which many students were deficient. This study shows that students who take CTE courses graduate at a higher percentage rate than students who do not participate in CTE and have a better understanding of those skills. To increase opportunities for students to gain this knowledge, local school boards could adopt a policy that all students must take at least one CTE class as a high school graduation requirement.

Developing these skills should begin in elementary school with career exploration and industry tours. While registering for classes at the end of eighth grade, counselors and career coaches should meet with students and parents to show the benefits of CTE and a pathway through high school that develops and builds these skills for

postsecondary education and employment. As students progress through high school, counselors should contact parents or meet with them each semester to ensure their child is progressing toward obtaining the skills they need.

CTE curricula could also create advanced research projects through advanced-level courses that require critical-thinking skills. The research project would allow creation and testing of new hypotheses and application of research findings to advance knowledge and/or improve the quality of student lives and careers.

To ensure CTE programs in rural communities are meeting the needs of the local community and region, program evaluations need to occur on a yearly basis. Local, regional, and state advisory boards should examine and identify the essential skills students are lacking to be career and college ready. To truly measure college and career readiness, advisory boards must develop an integrated approach that considers both academic skills and additional high-quality career preparation experiences. Employer leadership and involvement are critical for the development of essential skills needed to measure student success.

My Future NC is focused on educational attainment and is a collaboration between North Carolina leaders in education, business, and government. My Future NC has a goal that two million North Carolinians will obtain high-quality credentials or postsecondary degrees by the year 2030. My Future NC aligns and coordinates systems to support students at all levels, from pre-k education through high-quality certificate, associate, and higher degree programs. My Future NC can catalyze innovative and effective ideas that can be applied to rural areas across the state. Local advisory boards can collaborate with My Future NC and community colleges to help with their message.

Local businesses can set up billboards to publicize the needs of the community. Local businesses can offer tours of their company, show the current workforce demand, and communicate the essential skills needed of graduates to supply the market sector. While collaborating with local community colleges, public schools should align academic expectations across pre-k through 12 and postsecondary to ensure seamless transitions across education sectors.

Developing a local communication and marketing plan will emphasize the economic value and work to collectively achieve the attainment goals. Local, regional, and state advisory boards must develop reports that are shared with the public, local and state school boards, institutes of higher learning, and local and state governments that will be transparent to support the students and the development of essential skills to be career and college ready.

Limitations

The findings from the study are unique because the framework is grounded in three rural counties in western North Carolina. While the study specifically focused on CTE students from only three rural counties, their perspectives provided a broader understanding of the needs of the CTE programs within their school district. It should be noted that the findings from a small study of this nature may not be generalized to other rural counties.

The findings of the interview participants could have been affected by the position they maintain within the school system or by the employment opportunities within the county in which they live. The perceptions of the respondents, especially the employers, could have changed based on the talent pool of students who are completing work-based

learning opportunities within their business. The perceptions of the respondents, especially the employers, may have affected their responses if they were a parent of a student who attended the high school and participated in CTE courses.

One of the biggest limitations during the study was the fact that we have been in an unprecedented global pandemic that has impacted every aspect of our lives; in particular, the switch to remote learning for many with virtually no time to prepare. The pandemic presented a wide range of challenges, not only for effective teaching and learning but also for the physical, mental, and emotional health of learners and educators.

While efforts were put into place to eliminate my bias, there are no guarantees that my role as a district superintendent and former CTE director did not affect some of the responses of the participants.

The results of the study do have the potential to generate improvements in CTE programs in how they are developed in the future, despite the limitations. It is anticipated from these results that future explorations of CTE programs will be conducted to help school systems become more effective in building a workforce to meet the needs of not only the local and regional workforce but also the global economy.

Future Research

The study presents an opportunity for further research by being replicated with a larger pool of participants. Replicating the study in North Carolina in larger, more urban districts might provide the ability to compare results to determine if students in urban school districts are more prepared to be career and college ready and have the essential skills needed to be successful in the 21st century. An additional consideration for further study is to track students after graduation. This would allow local CTE programs to

validate the conceptual framework of CTE to determine postsecondary education completion, employment success, and wage earnings in a self-determined career pathway.

An additional consideration for a further study is the impact COVID-19 has had on students and the CTE programs in their schools. The study would collect data and report those data for continuous evaluation and program improvement. The data would analyze the effects on the labor market for program decision-making and provide appropriate access to relevant data for instructors, staff, learners, and the public. Data analysis will be critical to identify and address the ramifications of socially distanced, remote and blended learning on all students, particularly special and underserved students.

Some of the areas explored in the study are supported by previous research on CTE. Additional studies using a larger sample size across multiple school districts might find some common needs of CTE programs, students, and employers throughout the state. Replicating the study in other districts, based on employment needs, may add to the body of knowledge of which essential skills students are being taught in CTE programs and of which skills students are deficient. This information would help CTE programs be developed to meet employment needs nationwide.

Conclusions From Study

CTE is an important catalyst for improving student achievement and creating a workforce designed for the 21st century. We cannot think about preparing students for careers without making sure they acquire the skills necessary to plan for their future and to understand the global society in which we live. We know from the study that

employers are looking for professionalism and work ethic, oral and written communication, teamwork and collaboration skills, critical-thinking skills, and problem-solving skills; and student competency keys to success are professionalism, communication skills, teamwork, critical-thinking skills, problem-solving skills, networking, and enthusiasm, which correlate to employers hiring new workers.

We do not know what the jobs of the future might be, but we do know that students need to have the skills and information necessary to plan for their future, to use their imaginations, to utilize new tools to create products, and to take a creative approach to solve problems. Preparing students academically is a must, but we also must provide students with opportunities to learn about different career options in order to know what future educational and career paths they wish to pursue and help develop that plan.

CTE has grown in importance over the past half century. Technology advances have fueled the demand for a more highly skilled labor force. Economic conditions require a workforce of lifelong learners who have the knowledge and skills needed to work with new technologies and emerging careers. Now more than ever, CTE programs are needed to help ensure the strength of the workforce, global competitiveness, and the economic health of our nation.

The study examined CTE's role in student preparation to be career and college ready and the perceptions of community employers as to the skill levels of students participating in these programs. Through close examination and investigation, the study identified gaps in essential skills in which students have not been adequately prepared during their high school career pathway. It also found the limited opportunities many students are facing living in a small rural community.

Opportunities exist for local districts, institutions of higher learning, and local employers to partner on improving the overall effectiveness of CTE programs. One way school districts can create improvements is by creating not only local CTE advisory boards but also regional and state CTE advisory boards. This recommendation would help local CTE programs develop partnerships across the state to leverage more opportunities for student access to participate in programs that lead to employment in high-skill, high-wage, high-demand occupations or professions. As part of the leveraging opportunities, it is recommended that these organizations meet to discuss issues they are facing across the state. Recommended topics for discussion based on the participants of the study should include funding, teacher development and retainment, skills needed for the 21st century workforce, and preparation to be a productive citizen.

The study focused on local employers and their perceptions of the CTE programs within their district. The focus was to determine if adequate preparation is being provided to students through their CTE programs to have the essential skills to be workforce ready. Employers identified several skills in which students are deficient. Through the findings of the study, the researcher intends to improve CTE in rural counties of western North Carolina, hence improving the quality of employers who are entering the workforce.

As automation and technological advances change the nature of America's workforce and as global diversity and economic growth change the characteristics of the employee, CTE can play a vital role in the development of America's youth. It is the responsibility of the education system to incorporate CTE as a viable and valuable component in every high school, community college, and 4-year institution; that prepares students to be productive citizens in the 21st century.

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Appendix A
Informed Consent Form

Gardner-Webb University IRB
Informed Consent Form

Title of Study: A Study of the Impact of Career and Technical Education in Determining the Skills Gap in Selected Rural Communities in North Carolina.

Researcher: Chad S Beasley, Doctoral Candidate, Gardner-Webb School of Education

Purpose

The purpose of the research study is to determine if the skills being taught in Career and Technical Education programs address the current and future needs of society and employers.

Procedure

To properly capture the data, interviews will be conducted with principals, CTE directors, and HR director's from the top three employers of the County to mine the data and to drill even deeper into the respondent's answers from the interview questions. Principals will be the first participants in the interview process followed by the CTE directors and the HR directors. Interviews will last no longer than one hour. Time parameters will be explained and incorporated into the interview to help participants feel more relaxed before the actual interview takes place. Participants will be informed that they can skip any question that causes discomfort and that they can stop the interview at any time. I will explain to each participant the purpose of the interview; the confidentiality terms; detailing the format of the interview; giving the time parameters of the interview; providing the participants with the contact information of the researcher; allowing participants to ask questions before the interview begins, and recorded the interview so that there is a record of the conversation. In order to accurately work with the data from the individual interviews, an audio recorder will be utilized.

Time Required

It is anticipated that the study will require about one hour of your time.

Voluntary Participation

Participation in this study is voluntary. You have the right to withdraw from the research study at any time without penalty. You also have the right to refuse to answer any question(s) for any reason without penalty. If you choose to withdraw, you may request that any of your data that has been collected be destroyed unless it is in a de-identified state.

Confidentiality

Information you provide in this study from the audio transcription from the interview will be handled confidentially. There is no right or wrong response to the interview questions. No individual answers will be reported. Your name will not be used in any report. Only grouped data will be published. Interview responses and audio recordings will be destroyed in an ethical manner upon completion of this research study. When the study has been completed and the data have been analyzed, all media and data will be destroyed.

Data Linked with Identifying Information

The information that you give in the study will be handled confidentially. Your information will be assigned a code number. The list connecting your name to this code will be kept in a locked file. When the study has been completed and the data have been analyzed, this list will be destroyed. Your name will not be used in any report. When the study has been completed and the data have been analyzed, all media and data will be destroyed.

Risks

There is minimal risk associated with this study. District employees may respond negatively toward current practice in their school or school system. All responses will be kept confidential.

Benefits

There are no direct benefits associated with participation in this study. The study may help us to understand the impact of participation in CTE courses in determining if there are skills gaps in selected rural communities. The Institutional Review Board at Gardner-Webb University has determined that participation in this study poses minimal risk to participants.

Payment

You will receive no payment for participating in the study.

Right to Withdraw From the Study

You have the right to withdraw from the study at any time without penalty. If you choose to withdraw from the study, your audiotape will be destroyed.

How to Withdraw From the Study

- If you want to withdraw from the study, tell the interviewer to stop the interview. There is no penalty for withdrawing.
- If you would like to withdraw after your materials have been collected and submitted, please contact Chad Beasley at XXXX or by phone at XXXXX

If you have questions about the study, contact:

Chad S. Beasley
EdD Candidate
Graduate School of Education, Gardner-Webb University
Researcher telephone number: XXXXX
Email: XXXXX

Dr. Larry Putnam
Faculty Research Advisor
Graduate School of Education, Gardner-Webb University
Faculty Advisor telephone number: XXXX
Email: Lputnam1@gardner-webb.edu

If the research design of the study necessitates that its full scope is not explained prior to participation, it will be explained to you after completion of the study. If you have concerns about your rights or how you are being treated, or if you have questions, want more information, or have suggestions, please contact the IRB Institutional Administrator listed below.

Dr. Sydney K. Brown
IRB Institutional Administrator
Gardner-Webb University
Telephone: 704-406-3019
Email: skbrown@gardner-webb.edu

Voluntary Consent by Participant

I have read the information in this consent form and fully understand the contents of this document. I have had a chance to ask any questions concerning this study and they have been answered for me. I agree to participate in this study.

_____ Date: _____
Participant Printed Name

_____ Date: _____
Participant Signature

You will receive a copy of this form for your records.

Appendix B
Interview Protocol

Interview Protocol:

To facilitate my note-taking, I would like to audiotape our conversations today. For your information, only researchers on the project will be privy to the tapes which will be eventually destroyed after they are transcribed. In addition, you must sign a form devised to meet our human subject requirements. Essentially, this document states that: (1) all information will be held confidential, (2) your participation is voluntary and you may stop at any time if you feel uncomfortable, and (3) I do not intend to inflict any harm. Thank you for agreeing to participate.

I have planned this interview to last no longer than one hour. During this time, I have several questions that I would like to cover. If time begins to run short, it may be necessary to interrupt you in order to push ahead and complete this line of questioning.

Introduction

You have been selected to speak with me today because you have been identified as someone who has a great deal to share about Career and Technical Education and the skills students need for employment or secondary education after graduation. My research project as a whole will focus on the impact that Career and Technical Education (CTE) has in affecting students' ability to be Career and College Ready, and the overall effectiveness of the CTE experience. My study does not aim to evaluate the CTE program. Rather, I am trying to learn more about the relationship between academic achievement and participation in CTE programs. CTE's effect on student motivation, CTE's effect on student's ability to be college and career ready, and students' participation in employment or secondary education after graduation.

Interview Questions

1. Is the program's or school's message to all students that CTE is a pathway into college and/or career?
2. Does the CTE program prepare students for and offer a range of college credit bearing dual enrollment and/or AP courses in science, computer science, math, and the like?
3. Are the CTE program offerings a mix of the old trades (which now require sophisticated math and computer literacy) and high growth fields, such as cybersecurity, health care, and engineering?
4. Are CTE student s' aspirations based on well-informed decisions, not demographics, and do they reflect the full spectrum of postsecondary options, including apprenticeship, certifications, Community College, four-year institutions and beyond?
5. With which higher education institutions does the CTE program/ school have

partnerships?

6. Does the CTE program provide high quality, work-based learning experiences supervised by employers and include time for learning from work?
7. Are students learning transferable skills that will serve them well in the innovation economy?
8. Are the outcomes of CTE measured according to appropriate criteria?
9. Does the CTE program teach essential skills that include teamwork, critical thinking, and complex problem-solving skills that allow students to be successful for the rest of their life?
10. Does the content being taught in CTE classes mirror authenticity in the field?
11. Do you see weaknesses with the CTE programs being taught in the high schools?
12. What essential skill are students lacking to be career and college ready?
13. Does participation in CTE have an effect on student ability to be career and college ready?
14. On a scale from 1 to 5, with one being the lowest and five being the highest, how do you rate the overall effectiveness of the CTE experience within your school district?
15. What should high school CTE graduates know and be able to do?

Appendix C

Interview Questions

1. Is the program's or school's message to all students that CTE is a pathway into college and/or career?
2. Does the CTE program prepare students for and offer a range of college credit bearing dual enrollment and/or AP courses in science, computer science, math, and the like?
3. Are the CTE program offerings a mix of the old trades (which now require sophisticated math and computer literacy) and high growth fields, such as cybersecurity, health care, and engineering?
4. Are CTE student s' aspirations based on well-informed decisions, not demographics, and do they reflect the full spectrum of postsecondary options, including apprenticeship, certifications, Community College, four-year institutions and beyond?
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6. Does the CTE program provide high quality, work-based learning experiences supervised by employers and include time for learning from work?
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13. Does participation in CTE have an effect on student ability to be career and college ready?
14. On a scale from 1 to 5, with one being the lowest and five being the highest, how do you rate the overall effectiveness of the CTE experience within your school district?
15. What should high school CTE graduates know and be able to do?