ABSTRACT

Elizabeth J. King, A STUDY OF THE PERCEPTIONS OF THE EFFECTIVENESS OF TRADE AND INDUSTRIAL EDUCATION IN THE PREPARATION OF GRADUATES FOR EMPLOYABILITY AND POST-SECONDARY EDUCATION (Under the direction of Dr. Marjorie Ringler). Department of Educational Leadership, November 2016.

This dissertation was a mixed method study that examined the perceptions of the effectiveness of trade and industrial education of graduates' employability and post-secondary education. The purpose of this study was to research the following questions: To what extent did graduates perceive that the trade and industrial courses taken at the Robeson County Career Center contributed to their employment potential? To what extent did graduates perceive that the trade and industrial courses taken at the Robeson County Career Center added to their post-secondary educational potential? To what extent did Career-Technical educators at the Robeson County Career Center perceive that graduates who completed trade and industrial courses or received credentials were prepared for the workforce? To what extent did business professionals perceive that graduates who completed Robeson County Career Center trade and industrial courses were employable?

Data were collected from the 2013-14 Graduate Concentrator Feedback Surveys. Teachers and business professionals' data were collected with the same survey adapted to each audience. The findings indicated that teachers and business professionals perceived that trade and industrial courses had a positive impact on graduate employability and post-secondary education.

The conclusion suggested a disconnect of the graduates' perceptions of what is learned in trade and industrial courses in relation to future employment and post-secondary education. The need to establish partnerships between the

business/industrial communities and educational institutions and the necessity of educating students on the benefits of earning credentials were among the recommendations to improve the effectiveness of the Robeson County Career Center programs and specifically, how the center's graduates perceived these programs.

A STUDY OF THE PERCEPTIONS OF THE EFFECTIVENESS OF TRADE AND INDUSTRIAL EDUCATION IN THE PREPARATION OF GRADUATES FOR EMPLOYABILITY AND POST-SECONDARY EDUCATION

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Elizabeth J. King

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A STUDY OF THE PERCEPTIONS OF THE EFFECTIVENESS OF TRADE AND INDUSTRIAL EDUCATION IN THE PREPARATION OF GRADUATES FOR EMPLOYABILITY AND POST-SECONDARY EDUCATION

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DEDICATION

This dissertation is dedicated to my family. My mother, the late Ruth R. Conner, taught me by example to be a life-long learner. She was an inspiration with her many talents and love of people. Ruth was an avid reader with a thirst for knowledge. Mom's encouragement to persevere taught me determination and her love of family gave me the strength to overcome challenges.

My father, Lt. Col. David B. Conner, is inspiring as a member of the greatest generation. I have always admired Dad's work ethic, commitment to achieve, and contributions to his country. His service in the Korean War, serving during World War II under General George Patton, in the Normandy Invasion, and four tours of Vietnam were crucial to ensure freedom for the next generation. His spirit at ninety-three years of age represents an amazing strength of character. Remembering my parents and their passion to achieve, gave me determination to maintain my focus on this educational journey.

My brother, Eugene B. Conner, is industrious, dedicated to his family, and has a generous heart. His continued encouragement has helped me endure every challenge. Always supportive, he and his wife, Esther, live the definition of "Christian" each day. I am indebted to them for their family leadership and unconditional friendship.

My husband and four children are continuous reminders of family values that make each day a blessing. Dedication to their faith, their families, and their commitment to the heritage of the two-hundred-year-old King family farm is a tribute to previous and future generations. To be part of this family has been my life's greatest blessing and achievement.

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CHAPTER 1: INTRODUCTION

Need for the Study

It is hard to conceive that a simple one-room schoolhouse could evolve into today's diverse and enormous learning institutions that produce tomorrow's leaders. Our American history suggests that generations of Americans have attempted to promote an educational system that leads in the acquisition of knowledge and provides the most efficient cognitive intellectual growth (Akin, 2001).

At the turn of the century, Americans realized "that public education was a necessary social investment, that popular aspirations and national social and economic well-being demanded that it also be universal" (Clifford, 1978, p. 166). With the birth of the progressive education movement that began during the first two decades of the nineteenth century, much attention was directed towards educating the country's populace. Two leaders of this movement, John Dewey and Edward Thorndike, are credited with advocating two different views to educate the masses. John Dewey's "child centered wing" believed in "creative self-expression." Edward Thorndike's "mass education wing" believed in "science of education" (Levin, 1991, p. 71). The impact of these two philosophies caused many changes to occur in education. In 1927, the National Society of the Study of Education acknowledged that the current curriculum in public schools was inadequate. The group spear-headed a movement that invited educational professionals from all states to work on school curricula that fulfilled the American dream of an educational system that would help all young people develop into responsible, productive, and happy citizens (Tyler, 1987).

It is necessary for education to meet the trade and industrial challenges of a technologically advancing international market place (Brustein, 2006). As it is in the 21st. century, graduates in the United States compete with other countries for jobs in the U.S. homeland; therefore, the global market is indirectly centering education as the pivotal catalyst of a progressive economy (Cyzewski, 2011).

In the academic world, understanding that education is the foundation of teaching and learning for students challenged by international advances, best practices are sought for the most effective and efficient teaching strategies that empower young minds to learn. It is evident from United States society that in the current era of individualization, students need to be evaluated and taught by their identified learning styles that allow retention of knowledge and academic achievement (Brady, 2010). Therefore, learning styles in various forms should be considered when teaching diverse populations. For example, auditory and visual learners have advantages in the traditional classroom that elude the tactile and kinesthetic learners that need physical movement or application of competency for lesson retention. There should be a connection between appropriate teaching and learning styles with instructional modification to facilitate achievement by all learners (Gardner, 2006).

Education throughout the world is defined by cultural values and sets the precedent for participation in the globally competitive economy. Taking first place as the top global educational system is South Korea (Choi, 2014). Having replaced Finland's first place status, South Korea is remarkable with 100% of its population literate. It also ranks first in achievement tests of critical thinking and analysis. Hard work and grit are considered a prerequisite to educational success in South Korea (Choi, 2014).

In order to be considered globally competitive, the United States should be aware of educational goals in foreign countries. Finland, previously ranked number one in education globally, considers education to be the core of the community. Their belief that important learning happens outside the classroom is supported by the educational extra-curricular activities made available to students after a short school day. High priority is placed on a wide assortment of learning experiences. South Korea, on the other hand, mandates year-round school, believing in hard work and diligence without excuse for failure (Choi, 2014). The South Korean teacher emphasizes the classroom as a community. The South Korean education model teaches a student how to learn, how to work, and how to persevere for success after failure. Work outside of the classroom is viewed in the United States, as well as other countries, as a learning experience that reinforces curriculum (Choi, 2014). At career centers in the United States, students are encouraged to have work-based experience, which allows the student to apply hands-on activities from course competencies that have been taught in class. Internships, apprenticeships, and job shadowing are becoming more prevalent as curriculum application extends beyond the classroom (North Carolina Department of Public Instruction [NCDPI], 2006).

In direct contrast to the Korean teacher emphasizing the community classroom, the American teacher focuses on developing individual relationships with students. Critical thinking being a key component in South Korean education is also a component of Career-Technical Education in America (Choi, 2014). The nontraditional hands-on instruction practiced in United States' career centers influences the learning stretch for students from classroom instruction to implementation of the learning objective. In these

settings, American students learn sophisticated problem-solving and cognitive skills, an element of trade and industrial education (NCDPI, 2006).

The Henry Ford routine assembly line of yesteryear cannot meet the workforce needs of the 21st century without an educational overhaul (Choi, 2014). The manual labor of the 20th century has been replaced with technology driven education. With technology changing education, the demands of society dictate the trends in education. As a result, culture molds the values placed on the educational system and thus creates it. The responsibility of educational success or failure is not just on the parent, student, or teacher. The culture of the system is responsible for educational progress (Choi, 2014).

Until manual skills are valued, nontraditional education will not be at the forefront of educational reform. The current focus hinges on what skills current graduates need to meet the ever-changing needs of the global market, and some potential ways to address shortcomings in our collective educational systems (Lepi, 2014). The world's economic market is mandating the need for trade and industrial skills and yet, United States' career centers are slow to receive recognition as a needed educational institution in today's academic world.

American culture supports a strong educational system with rhetoric about equality of opportunity. With opportunity giving the advantage to an educated workforce of skilled labor, career centers may be a trade and industrial resource for educational reform. Past years have not demanded that American youth master sophisticated problem-solving and critical-thinking skills in order to survive (Choi, 2014). Cultures need to catch up to the economic reality of today's world. Graduates do not have the

skills or grit to make it in the current global economy. Most importantly, the global economy has made modern cultures face the economic realities that our youth need to acquire skills and a consistent work ethic to succeed in the world economy (Choi, 2014).

As previously initiated in the Eight Year Study (Akin, 2001), once again the American educational system was urged to create programs for the advancement of academics to generate industrial growth that will enable graduates to be prepared for employment in the future economy (Brustein, 2006). For example, the American Welding Society (AWS), a national union, has addressed the shortage of welders by starting an initiative with schools, governing bodies, and the media to help inform the public regarding this approaching crisis (AWS, 2014). The AWS is concerned because most of the 500,000 welders employed in the United States are over the age of 50. Few professional welders are now being trained to replace those getting close to retirement age (Cyzewski, 2011). High schools, colleges, and vocational institutions are working to recruit students with an interest in welding. The stereotype of welding being a dirty job without advancement in position or salary has misrepresented the industry. Welders and welding are in demand to keep the nation's manufacturing industry productive (Cyzewski, 2011).

Welding is a profitable career that is becoming globally competitive while contributing to our nation's economic growth. For example, in some states welding contracts have been awarded to the Chinese instead of Americans. American Welding Society claims that Chinese welders are paid less; therefore, American welders are struggling for a piece of that manufacturing market (AWS, 2014). During World War II, American welders helped to defeat Hitler because they were able to completely build an

airplane every 55 minutes. Far removed from the admiration of manufacturing jobs 70 years ago, welding suffers from a negative image today while teachers and parents guide graduates towards four year degrees and away from industrialized careers (Cyzewski, 2011). This negative impact on blue collar labor has created a surge of four-year education with little value placed on associate degrees in trade and industrial education. Ironically, today, a beginning teacher in North Carolina may make a starting salary of $35,000 a year with a four-year degree while an electrician, plumber, or welder with an associate's degree may have a beginning salary of $45,000 to $60,000 a year. The difference in salary alone demonstrates the value of trade and industrial skills in today's economy (Perdue, 2013).

In 2011, Mike Rowe, a TV personality and an advocate of skilled labor, presented his insight on the diminishing skilled labor workforce to the U.S. Senate's Commerce, Science, and Transportation Committee. He delivered compelling evidence of the necessity of skilled labor to our economy. Mr. Rowe stated that there was a widening skills gap in America with over 200,000 vacant positions and 450,000 openings in trade, transportation, and utilities. His overall message suggested that with over one-third of the skilled labor force retiring, there is serious concern about replacements (Rowe, 2011).

A large concern for the trade and industrial workforce is the prevailing apathetic attitude of Americans pertaining to the value of blue collar jobs. Parents, as well as students, view apprenticeships and "on the job training" as opportunities for those who are not interested in attending a four-year college (Rowe, 2011). These critical trade professions are no longer considered valued careers. America needs to close the skills

gap by advocating for educational programs that ensure future employees for companies that are desperate to hire skilled tradesmen (Rowe, 2011). Due to the shortage of certified welders, the building of some power plants was forced to stop. Education can help to alleviate this tradesmen shortage by changing public opinion to encourage trade and industrial vocations (Rowe, 2011).

In America, the fastest-growing jobs may not require college degrees (Freed, 2013). The Bureau of Labor Statistics data indicate that carpentry, home health aides, and other skilled labor occupations are among the fastest growing in the country. While many of these jobs require specific skills and abilities, the data suggests that a bachelor's degree is not a necessity (Freed, 2013).

About forty-eight percent of employed United States College graduates are in jobs that the Bureau of Labor Statistics (BLS) suggests requires less than a four-year college education. Eleven percent of employed college graduates are in occupations requiring more than a high-school diploma, but less than a bachelor's degree, and thirty-seven percent are in occupations requiring no more than a high school diploma (Nolan, 2013). It is necessary to take a look at curriculum programs that support the training, skills, and certification that are required in today’s economy and how re-evaluation of current programs can help meet trade and industrial workforce demands.

Statement of the Problem

This study addressed high school graduates’ post-secondary educational preparedness and their employability to enter the technological advancing global market. The study investigated the trade and industrial education at the Robeson County Career Center designed to prepare graduates to further their education or to

enter the workforce. The ability of graduates to compete globally in the field of technology and industry continues to challenge the secondary educational system. During the last century, technology changed our industrial economy, eliminating the need for some jobs while creating others. The U.S. labor market and business sector suggests that America is one of the top producing nations in the world economy (Cyzewski, 2011). Yet, our public school curriculum continues to use its 20th century educational models to prepare graduates for an ever-changing technological workforce. The United States' educational system needs innovative courses to prepare our graduates to compete globally (Brady, 2010).

Different countries promote educational values that are prominent in their culture. Through these values, students are exposed to community service, work-based learning activities, or year-round school that emphasizes hard work. Whether it is cultural specifics that encourage society's vocational needs, there should be a pathway that enables students to access appropriate curriculum to facilitate a chosen career (Choi, 2014). In the United States, four-year degrees have been emphasized for employment opportunities while two-year degrees for specialized credentials are often not discussed as options. They are preceded by secondary education that initiates career options. To promote specialized skills, educational courses pertaining to trade and industrial vocations have been reintroduced from the mid-1900s through secondary schools at career centers. Skills needed by students for the 21st century are emphasized at career centers (Perdue, 2013).

Skills needed today have changed to include a set of abilities that each student should develop to be successful in the new information age. Prior to the 21st century,

industry workers held jobs using key skills that included knowing a trade, following directions, getting along with others, working hard, being professional, efficient, prompt, and honest. However, critical thinking skills have become valuable in today's industry as workers now are expected to solve problems. Proactive teamwork, communication in diverse medias, knowledge of current technology, and the ability to retain enormous amounts of information are necessary attributes to be competitive in industry. These skills are vital for graduates to be flexible, take initiative, and lead towards producing new and useful products (Thoughtful Learning, 2015).

Skills for the 21st century have been divided into three categories; learning skills, literacy skills, and life skills. Learning skills include critical thinking, creative thinking, collaborating, and communicating (Thoughtful Learning, 2015). Of the four, collaborating and critical thinking are prioritized for trade and industrial graduates. Literacy skills include information literacy, media literacy and technology literacy. Life skills include flexibility, initiative, social skills, productivity, and leadership. Trade and industry prioritizes productivity and leadership as teaching goals (Perdue, 2013).

Traditional schools of the last century did not prepare students to compete in a global economy, nor did they reflect the influences of an ever-changing world market place with instruction, assessments, and programs (Brady, 2010). A changing economy influences educational advancements; therefore, public schools should concentrate on technology and current skills needed to be globally competitive.

To diminish the instructional deficiencies created within secondary education when all students are taught by the same methods, instruction should address identified and appropriate learning styles to foster student retention and academic achievement

(Gardner, 2006). Multiple intelligences indicate that talented and diverse learners in many career areas are high achievers. Modification of instruction to address diverse learning styles could increase achievement levels. Gardner's (2006) study endorses the recognition of diverse intelligences in the classroom setting.

Global competition along with technological gains has created employment opportunities and business growth, whereas deindustrialization has resulted in lost jobs throughout the manufacturing world. More jobs have been realized in the areas of professional services and finance with the well-educated receiving better salaries. Policies that generate trained workers with specific skills and career education can support a significant increase in employable workers (Holzer, 2011).

Manufacturing trends and a deficit of skilled laborers suggest that the greater segment of the manufacturing market is moving towards a growth similar to the technology trend of the 1990s. Industries have found a reoccurring obstacle when seeking skilled workers; graduates are reluctant to enter industrial jobs (Cyzewski, 2011). The decrease in skilled labor has had a damaging effect on US manufacturing. Companies such as Caterpillar, Inc. cannot find skilled welders or machinists; therefore, hampering manufacturing until the positions are filled (Cyzewski, 2011). Furthermore, the American Welding Society claims that only one welder enters the workforce as two retire. The lack of skilled laborers has created an industrial deficit (Cyzewski, 2011). These problems encourage the support of trade and industrial education.

Study Population

Robeson County's rural economy was once primarily agriculturally driven with a few textile industries that employed skilled and unskilled labor. Like many other counties

in North Carolina, during the past 40 years, two-thirds of the industries in Robeson County have either relocated to other counties or moved overseas (Southeastern Economic Development Commission [SEDC], 2012). The loss of over 100 industries that were once a vital part of this region has resulted in more than 10,000 unemployed county residents. Records indicate from 1995 through 2012 the economic effect of losing industry has increased the county's displaced workers. The increase of unemployed workers has dramatically decreased county tax revenue contributing to Robeson County becoming one of the poorest counties in North Carolina (SEDC, 2012). Centrally located along the eastern seaboard with Interstate 95 running directly through its county seat, Robeson County has resources such as land, access to railroads, and nearby airports which makes it a prime location for industry. Along with these resources, a skilled and educated workforce may attract industrial interest.

The unskilled, unemployed population of Robeson County receives aid from assistance programs provided by the Department of Social Services. As one of the largest and poorest rural counties in North Carolina, the $415 million Social Service budget sustains a low standard of living for this low wealth community (Robeson County Budget, 2014). Trying to resolve an educational deficit, Robeson Community College maintains a $2.5 million budget to make basic educational courses available to high school dropouts (Robeson Community College, 2012). Year after year the Robeson County Public Schools strive to educate and train students to be productive citizens. A decreasing high school dropout rate (NCDPI, 2013a) over the past five years has increased the Public Schools of Robeson County's graduation rate, but the lack of business and industry continues to plague the county's overall economic growth that

should sustain the employment of the high school and community college graduates (Robeson County Economic Development, 2013).

The training of trade and industrial students to build a skilled workforce is vital to the growth of the local economy. The idea of a Career-Technical Education Center as a new technology high school in Robeson County has been considered, but it would require millions of dollars in funding (Fayetteville Observer, 2013). Until funding is secured, the Robeson County Career Center will continue to offer trade and industrial courses. The Robeson County Career Center serves six high schools with a 300-student limit per semester; therefore, only 60 students per school have access to industrial courses. Robeson's three largest high schools range in population from 1,000 to 2,300 students; hence, expansion of trade and industrial classes at a technology high school would support a larger number of students pursuing industrial and technology certification. Furthermore, the evolution of the current Career Center into a technology high school would be a strong academic link to 21st century skills and courses that would ensure the readiness of Robeson County graduates to be globally competitive (Fayetteville Observer, 2013).

The trade and industrial deficit of skilled labor is a current and ongoing problem in the American economy. Secondary education, such as instructed at the Robeson County Career Center, should meet the challenges of the technologically advancing international market place by establishing a comprehensive and competitive educational system that facilitates the training of a trade and industrial workforce.

Purpose of the Study

There is a growing awareness that emphasizes the need for educational preparation that promotes employment opportunities for skilled laborers within deficit areas of the economy. The purpose of this study was to assess how graduates, educators, and business professionals perceived the trade and industrial education at the Robeson County Career Center prepared students for employability and post-secondary education. Supporting the need for hands-on learning by tactile and kinesthetic methods, assessments of students' learning styles may indicate a connection between nontraditional instruction and student workforce readiness. The skills needed to meet the demands of the 21st century economy are challenging for the educational system's reevaluation of courses and instruction to promote educational advancement in the Public Schools of Robeson County.

This study explored the graduates' perceptions of the Career Center instruction, teachers' educational expectations, and business professionals' evaluation of the Career Center graduates' readiness for employment or post-secondary education. It is important that career centers articulate the vision for achieving 21st century skills needed in the global economy.

Study Questions

Four questions were developed for this study. The questions were as follows:

1. To what extent did graduates perceive that the trade and industrial courses taken at the Robeson County Career Center contributed to their employment potential?

2. To what extent did graduates perceive that the trade and industrial courses taken at the Robeson County Career Center added to their post-secondary educational potential?
3. To what extent did Career-Technical educators at the Robeson County Career Center perceive that graduates who complete trade and industrial courses or receive credentials were prepared for the workforce?
4. To what extent did business professionals perceive that graduates who completed Robeson County Career Center trade and industrial courses were employable?

Problem of Practice

The Robeson County Career Center is one of nine career centers located in North Carolina that teaches trade and industrial courses. The career centers or technical high schools located in North Carolina are nominal compared to the fifty-nine career centers listed on the South Carolina Public Schools' website (South Carolina State Department of Education [SCSDE], 2013). Understanding that trained or educated workers attract industry, it is without question that an educationally progressive state with a skilled and technically trained workforce has an economic advantage (Cyzewski, 2011). With the recent location of Boeing Industries and the Mercedes-Benz Company in South Carolina, it is evident that South Carolina is attracting new industry with an adequately skilled and educated workforce. Increasing the number of trained and skilled graduates exiting from the Public Schools of Robeson County is possible if educational priority is given to advancing Trade and Industrial Educational courses. Tomorrow's workforce needs to be trained today by an educational system that values and

understands the skills necessary to compete in a global economy. To increase participation in technology courses, students' talents and aptitudes can be matched to their educational interests facilitating the students' dedication towards graduation and achieving certification in a career area. Furthermore, the attraction of business and industry to Robeson County is dependent upon a trained and skilled workforce educated for future jobs in a technology based economy (Cyzewski, 2011). The continued support of a progressive career center or technical high school in Robeson County would provide the specialized training necessary to fill these advanced positions and strengthen a weak economy.

Diverse learners comprehend best when multiple instructional strategies are used to address their learning styles. Understanding that all students do not learn by the same method of instruction, modified instruction that addresses multiple learning styles should facilitate comprehension of a lesson and increase learning. This study considered the participants' perception of the impact of hands-on learning as part of the instructional strategies at the Career Center and their perceptions of the impact on academic achievement as educational practices become more committed to the integration of nontraditional strategies for diverse learners (Edison, 2013). Teaching all students by helping them to reach their potential academically is a continuous challenge. Additionally, education should meet the economic demands of the global workforce for the benefit of the individual worker, student, and the survival of the American economy (Rowe, 2011).

The Robeson County Career Center strives to produce graduates who are skilled and who are critical thinkers. Hands-on applications of lessons teach students to use

what they have learned in the lesson by completing a project using cognitive abilities (Rowe, 2011). Learning theory motivates the students' thoughts; however, the ability to analyze and create involves intelligence, research, knowledge, and judgment.

Career-Technical Education has developed objectives for each course taught throughout the state of North Carolina. Most of the traditional education taught at county high schools is limited to activities that provide application of learned content. Hands-on learning of competencies from trade and industrial courses such as electrical, mechanics, and welding taught at the Robeson County Career Center are unique due to the nontraditional instruction or course application provided by teachers who are veterans of the industrial sector. The application of instruction occurs in a lab setting that facilitates use of kinesthetic and tactile teaching methods that accommodate the nontraditional learner (Brady, 2010). The application of competencies through kinesthetic and tactile activities generates academic retention beyond that of the traditional classroom. In the nontraditional classroom or career center lab, students complete modules of performance assessments that are linked to each taught competency. Instruction should facilitate learning that connects the students' cognitive ability with actions that promote comprehension of the lesson's objective. Since career centers practice hands-on learning in addition to traditional classroom presentations, multiple learning styles are addressed when preparing curriculum lessons for diverse learners (Brady, 2010).

Trade and industrial courses enable a significant jump-start to graduates' post-secondary education career paths while preparing graduates for various industrial recognized certifications. Certifications in trade and industrial education courses are

offered in areas of Automotive Service Technology, Computer Engineering, Construction Technology, Drafting, Electrical Trades, Masonry, Motorsports, Plumbing, and Welding (Perdue, 2013). Upon successful completion of first and second level courses, within a desired program area, graduates are able to start their career or continue their education at the college level. These programs give students a head start by preparing them for certification as technicians (Perdue, 2013). Students can also articulate their career center coursework with the local community college to receive credit hours for courses completed in high school (Perdue, 2013).

The need for trade and industrial workers was created by the manufacturing deficits in the American economy. The importance of a career center's nontraditional instruction should be substantiated in order to gain recognition as an educational method by which a skilled workforce can be produced. A progressive educational system should value its students' abilities and potential career goals.

Overview of Methodology

This study was a problem of practice that was addressed by survey research of a mixed method approach. The study researched the need to promote trade and industrial careers as a viable alternative to the college preparatory curriculum by investigating the perceptions of graduates, teachers, and business professionals. The research problem was an issue or concern that needs to be addressed to determine the effectiveness of trade and industrial education in the preparation of graduates for employability and post-secondary education. "A mixed method design is useful when either the quantitative or qualitative approach by itself is inadequate to best understand a research problem or

the strengths of both quantitative and qualitative research can provide the best understanding" (Creswell, 2008, p. 18).

Data from the three audiences surveyed were triangulated to analyze the perceptions of the effectiveness of trade and industrial courses. In this problem of practice, generativity was developed through an independent research project that generated new content unique to trade and industrial careers (Erik, 1950). The Graduate Concentrator Feedback survey was adapted for the purpose of compiling data from the two sample audiences related to the perceptions of the effectiveness of trade and industrial courses' nontraditional instruction on graduates' post-secondary education and employability. "Generativity is the system's capacity to produce unanticipated change through unfiltered contributions from broad and varied audiences" (Zittrain, 2008, p. 70). The research survey contained qualitative and quantitative questions which allowed for three perspectives by graduates, teachers, and business professionals. Simple, direct questions that mirrored the state's Graduate Concentrator Feedback Survey generated participants' responses. Open-ended questions solicited comments about concerns, experiences, and other significant issues relevant to trade and industrial education. There was vast potential for the use of the knowledge gained by this study. It was realistic to project that the data could be used to advocate for changes and adaptations of CTE that are informed by potential employers.

The quantitative survey questions generated perceptions from three audiences utilizing a Likert scale with numeric values that included: Strongly Agree (5), Agree (4), Neither Agree nor Disagree (3), Disagree (2), and Strongly Disagree (1). The qualitative survey question was open-ended for teachers and business professionals to write

ideas, suggestions, or opinions that reflect their views. The survey methodology was chosen due to the availability of three different audiences; however, the survey instrument was adapted for each group. In addition, to protect the integrity of the study, a validation committee reviewed the questions to ensure the validity of the surveys and to ensure that each survey addresses the intended sample audience.

The purpose of this study was to assess how graduates, educators, and business professionals perceived that the trade and industrial education at the Robeson County Career Center prepared students for completion of post-secondary education or employment. The perceived impact on graduate employability or readiness for post-secondary education was studied through survey research. Data were obtained and triangulated from three surveys. The Graduate Concentrator Feedback Surveys (NCDPI, 2013) investigated the graduates' perceptions of employability and post-secondary-educational readiness. Additionally, career center teachers and local business professionals that have been directly influenced or affected by career centers' nontraditional instruction were surveyed using an adapted version of the Concentrator Feedback Survey to determine the effectiveness of trade and industrial education in the preparation of graduates for employability and post-secondary education. This study also included in the surveys graduates who were active in the workforce. The data from these surveys were used to determine if skilled preparation and industrial credentials hastened acceptance into the workforce and if Career-Technical Education courses provided knowledge and skills that influenced graduates to continue their education. The same Graduate Concentrator Feedback Survey (NCDPI, 2013) adapted for Robeson County Career Center teachers evaluated the instructional influence on career

center graduates. Business professionals completed the same Concentrator Feedback Surveys (NCDPI, 2013) to evaluate their perceptions of how the influence of nontraditional instruction affected the hiring or employability of career center graduates.

Definition of Terms

Assessments—The use of empirical data on student learning to refine programs and improve student learning (NCDPI, 2010).

Career Centers—A high school that offers an extension of career-technical courses in addition to the regular high school program (NCDPI, 2010).

Career-Technical Education—Organized education programs that are directly related to preparing graduates for employment in occupations requiring other than a baccalaureate or advanced degree. In grades nine through 12, Career-Technical education includes the specific disciplines of agriculture education, business and marketing education, family and consumer science education, health occupations education, technical education, technology education, and trade/industrial education (NCDPI, 2010).

Competencies—Competencies are the skills, knowledge or abilities that enable good performance in a particular role (NCDPI, 2010).

Curriculum Instruction—A field within education that seeks to develop and implement curriculum changes that increase student achievement within and outside of schools. The field focuses on how graduates learn and the best ways to educate (NCDPI, 2010).

End Of Course (EOC)—Assessment of graduates in grades 9-12 to be tested on the knowledge and skills they have gained from taking specific courses (NCDPI, 2010).

Hands-on-Learning—Experimental education is a process that occurs between a teacher and student that infuses direct experience with the learning environment and content. The term is mistakenly used interchangeably with experiential learning (Edison, 2013).

Kinesthetic Learners—Graduates who learn best by touching or doing (Edison, 2013).

Learning Styles—Various approaches or ways of learning. They involve educating methods, particular to an individual, which are presumed to allow that individual to learn best (Edison, 2013).

Nontraditional Classroom—To enhance the quality of teaching and learning in the classroom using strategies such as active, cooperative, collaborative and problem-based learning can be utilized (NCDPI, 2010).

Program Areas—Rigorous academic content closely aligned with a career area (NCDPI, 2010).

Program Certification—A non-degree program designed to provide graduates with specialized knowledge that is less extensive than, and different from, a formal degree program (NCDPI, 2010).

Tactile Learners—Learns through moving, doing, and touching; learns best through a hands-on method, actively exploring (Edison, 2013).

Traditional Classroom—Transmits to a next generation those skills, facts, and standards of moral and social conduct that adults deem to be necessary for the next generation's material and social success (NCDPI, 2010).

Vocational Education—Training for a specific vocation in industry or agriculture or trade (NCDPI, 2010).

Assumptions

The assumptions of the study of career centers included the following:

- Career centers support hands-on learning which represents nontraditional instruction in Robeson County Schools.
- Graduates of the Robeson County Career Center are interested in Trade and Industrial careers.
- Career centers increase employability of graduates with instruction that teaches transferable, vocational skills preparing them to compete in a globally competitive workforce.
- Career centers increase post-secondary educational opportunities for high school graduates.

CHAPTER 2: REVIEW OF THE LITERATURE

Introduction

Chapter 2 established a theoretical foundation for the focus of this study by reviewing relevant literature that supports the educational significance of career centers in preparing high school graduates to enter the workforce with employable skills and specific career certification or to continue post-secondary education. A historical overview projects the emergence of congressional support for Career-Technical Education due to its ability to train and build a workforce within the secondary educational years. Accountability models mandated for academic achievement were discussed to illustrate how the state of North Carolina continues to be a leader in educational initiatives.

State administrators focused on providing educators and students a vocational program with accountability standards. A look at the transition between secondary education post-secondary career choices illustrated career-technical education's objective to provide optimum learning opportunities for every student. Supporting the new educational initiative of vocational education were gubernatorial leaders that brought North Carolina to the forefront of academic standards. Educators' professional development was implemented to ensure academic achievement. Whether the student chose to continue a post-secondary education or enter the workforce, their educational preparedness was based on the restructure of the learning process with focus on learning styles and special needs.

Partnership with the educational community requires a foundation of teamwork. While students focused on education to ensure a future of employment, emerging was

an increase demand for skilled labor in manufacturing that strongly encouraged the promotion of critical thinking skills in the workplace. To validate graduates' experience, concentrator feedback surveys were administered to measure the impact of vocational courses. Nontraditional instruction includes the application of competencies to accommodate a variety of diverse learning styles. Deficits in trade and industrial manufacturing called for innovative transformation of education to maintain competitiveness in a technological advancing global economy. The emergence of career centers that taught technical skills along with problem-solving strategies provided trade and industrial education with nontraditional secondary courses. Career centers delivering education in multiple ways connected knowledge from core subjects to students' cognitive thinking and hands-on learning.

This research examined the assumption that nontraditional instruction at career centers enables and strengthens education to meet economic demands of the 21st century global economy. As technology became an integral part of daily lives over the past 30 years, the emergence of career centers throughout the Carolinas helped to promote career-technical curriculum as a necessary component of the 21st century workforce initiative. Chapter 2 concludes by indicating how student achievement at career centers is elevated through the connection of career-technical education curriculum, competency application, and workforce readiness.

Historical Background/Overview of Career-Technical Education

At the conclusion of the 1800s, the United States began a movement to establish public secondary schools. As the movement progressed, there were disagreements over classical and practical education and their roles in the emergence of a national

education program. At the turn of the century, educational advocates suggested that to prepare graduates to work in an industrial economy, a revision of curriculum was needed. At that time only eight percent of youth graduated from high school which added to concerns of the country's ability to compete in the industrial markets (Brustein 2006). Coalitions were formed by concerned citizens to lobby for federal legislation.

In 1914, a commission to study national aid for vocational education was authorized by the U.S. Congress. The Commission on National Aid reported that there was an urgent social and educational need for vocational education in secondary public schools. National grants were made available at a federal level because the need was too great to be addressed on a local level. Funds were needed to support vocational education, train teachers, partially pay teacher salaries, supervisors, directors, and to subsidize vocational studies by a federal board (American Vocational Association, 1998).

Senate Bill 703 was introduced by Senator Hoke Smith of Georgia as follows:

> To provide for the promotion of vocational education, to provide for cooperation with the States in the promotion of such education in agriculture and the trades and industries, to provide for cooperation with the States in preparation of teachers of vocational subjects, and to appropriate money and regulate its expenditure. (American Vocational Association, 1998, p. 6)

In 1916, a member of the commission introduced legislation designed to prepare workers for useful employment within the vocations of most demand and to train students in trade and industrial courses in high school. The dropout rate was increasing the number of citizens with a lack of education and/or no skills with which to support themselves (Brustein, 2006). President Woodrow Wilson addressed Congress in December of 1916, to pass the bill for the vital need of economic development for the

future. The Smith-Hughes Vocational Education Act became law on February 23, 1917 (American Vocational Association, 1998).

The Start of Federal Funding

The Smith-Hughes Act provided $1.7 million for 1917-1918, increasing to $7.2 million for 1925-1926. At the same time, the Federal Board for Vocational Education was recreated to administer the new law. Members included the Commissioner of Education, Secretaries of Commerce, Agriculture, Labor, and three citizens. As a result, states were required to create state boards for vocational education. Their purpose was to plan, approve, and operate vocational programs. State and local communities were required to match federal funds dollar for dollar (Brustein & Krvaric, 2007). This training proved to be valuable during World War I. Civilian workers acquired vocational skills that they used in the post-war economy. By 1926, Vocational Education enrollment had increased from 200,000 to 900,000 graduates (Ogden, 1990).

With the movement to decrease federal expenses in the early 1930s, Vocational Education had to reorganize to prevent the Smith-Hughes law from being abolished. Due to the decline of Vocational Education advocates, President Franklin D. Roosevelt placed its operations in the Office of Education in 1933, and with help from the George-Deen Act, $14.55 million was authorized for vocational education (American Vocational Association, 1998). With these funds during World War II, The National Defense trained about 7,500,000 employees for war production (Ogden, 1990).

Carl D. Perkins Act

During the years 1926–1976, there was a movement towards trade and industrial education to enhance the American workforce. The first major recognition of Career-

Technical education came after World War I and continued to increase during the following years. World War II caused a surge in Career-Technical education as technical skills were needed for security and defense. The program was expanded with the training of adults for re-entry into the workforce (Association for Career-Technical Education [ACTE], 2015).

During the 1950s and 1960s, Vocational Education received an enormous amount of disapproval from experienced educators due to their lack of knowledge about it. However, Congress endorsed Vocational Education to train people who were displaced or unemployed. The expiring federal legislation was replaced by House Bill 4955 and was signed by President Lyndon B. Johnson. House of Representative Carl D. Perkins of Kentucky eventually became the House Education and Labor Committee Chairman and one of the most influential advocates for Vocational Education (Tanner & Tanner, 1980).

The 1976 Vocational Education Act amended the original 1963 Act requiring states to distribute funds for integration of vocational classes and to reduce barriers caused by stereotyping and gender bias. To maintain the equality issue, in 1984 coordinators were hired with state funds for that specific purpose. The Act was reauthorized during the 1990s to ensure the elimination of gender stereotyping in elementary and secondary education (McBride & Parry, 2011).

Social issues were eventually addressed by vocational education in (Brustein, 2006)1976 identifying the needs of disabled and disadvantaged students. Special populations were the focus of The Carl D. Perkins Vocational Education Act of 1984, appropriating funds for a five-year period. The Perkins Vocational and Applied

Technology Education Act was reauthorized in 1990 for $1.6 billion per year through 1995 which reflected Congress's continued support of vocational education (American Vocational Association, 1998). This surge of vocational support demonstrated Congress's approval of the integration of vocational and academic instruction. Congress set into effect a mandate that vocational education had to include a broader skill base and had to use basic academic concepts as part of the curriculum (Brustein & Krvaric, 2007). The Carl D. Perkins law was again challenged to meet the needs of special populations with demands for a viable instruction of vocational education for college graduates (Ogden, 1990). With the Republican Party gaining control of both the House of Representatives and the Senate, the Perkins Act had the support it needed for reform from the Republicans Party, but Democrats were not on board with its restructuring.

As the pros and cons of the reform gained recognition, two major concerns surfaced: Vocational Education was in need of being restructured by combining the multiple programs that had previously been created, and federal requirements were to be reduced allowing block grants to be administered by local and state governments as needed (Brustein, 2006). With block grant funds slowly diminishing, Congress has considered combining these monies with the Job Training Partnership Act which would give governors the power to reallocate these funds for special populations. Parents and conservative groups began to object to the school-to-work program that could limit career choices for their children (Brustein & Krvaric, 2007). Finally, in October of 1998, a new Perkins Act was passed with vocational education remaining a separate program in the educational system. With the passage of the 1998 Perkins Act, Congress

confirmed continued support of vocational education programs to train a skilled workforce for the 21st century (American Vocational Association, 1998).

The abbreviated version of the 1998 Perkins Act was purposeful in the streamlining, simplification, and increased flexibility design by Congress. However, the recipients of the Perkins funds had to adhere to specifications in meeting industrial needs and the requirements of the Perkins Act (Brustein, 2006). Perkins was part of the WIA (Workforce Investment Act) which did not pass during the 104th Congress. The Job Training Act and the Perkins Act were combined under the Department of Labor to include job training, adult education, and vocational education. If a state exceeded its performance levels under all three provisions, incentive grants were to be awarded from the 54% set aside of Perkins funds (Ogden, 1990). With states and local LEAs having discretion over the expenditures of funds, the outcome should have benefited the classrooms (American Vocational Association, 1998).

The Perkins Act was again authorized by Congress in 1998 to increase the quality of technical education in all states. However, in 2006, three major changes took place to improve the Act. The name was changed to Career-Technical education, the Tech Prep program became a separate entity of federal funding, and the administration required the development of articulation agreements to strengthen local accountability provisions (McBride & Parry, 2011).

Changes in the 2006 Perkins Act

The authorization of the 2006 Perkins Act demonstrated the support Congress has for the career-technical programs in helping the US meet the demands of the 21st century, and students' educational needs (Perkins Act, 1998). The focus of the 2006

Perkins Act was to build on prior success of rigorous student achievement, increase accountability, and to provide transition between secondary and post-secondary Career-Technical education (Brustein, 2006). It continues to focus on special populations with reporting information emphasizing achievement levels. The legislation is the catalyst encouraging industry and higher educational institutions to work together to produce a strong workforce able to compete in the global economy. “Career-Technical education is important in the life of our nation,” Senator Edward Kennedy proclaimed in July of 2006, “Vocational Education has emerged into cutting edge technology that focuses on growing fields that will become jobs of the future. Vocational Education is not the 1950s version. That is why we now call it Career-Technical education” (American Vocational Association, 1998, p. 4). Career-Technical Education is called the “hope bill” because it allows students a look at what can be accomplished in technical education. This so called “hope bill” expands math and science programs to provide career options for special populations who may face challenges in their attempt to become self-sufficient (American Vocational Association, 1998). It is important for rural America to have vocational training or instruction coordinated with current practices to meet the needs of the local workforce. The application of knowledge is apparent to students through career-technical education as they explore career goals. The assessments and competencies of career-technical education can be aligned with national industry standards to help collect and analyze data for post-secondary and employment outcomes (Levesque et al., 1995). Stronger academic and technical integration, connections of secondary and post-secondary education are synonymous with connections to business and industry.

The Perkins Act enables educational institutions to build on high skill, high wage, and high demand occupations in current or emerging professions; promotes the development of rigorous and challenging academic and career-technical instruction; increases state and local flexibility to provide and design career-technical education; disseminates national best practices to improve career-technical education programs; promotes leadership; improves the quality of career-technical education teachers; supports partnerships between educational institutions; provides on-going opportunity to gain knowledge and skills to keep America competitive; and allows learners to explore a wide range of career opportunities in nontraditional careers (Brustein & Krvaric, 2007).

Accountability

The accountability component measures student performance for the purpose of increasing the curriculum quality of technical education. Perkins Law continued to improve educational standards by raising expectations for students who participated in Career-Technical education. This was done by holding the students to specific, identified and reliable accountability standards that have continue to be updated providing the most effective methods identified to maintain student success (McBride & Parry, 2011).

The foundation of the new Act of 1998 was increased accountability with new components of data collection and reporting requirements. Accountability became increasingly important to qualify attainment of curriculum competencies through career-technical testing data collection (NCDPI, 2013a). Four areas of expected performance levels included first: student attainment of vocational, technical and academic skill proficiencies; second: acquisition of secondary or post-secondary degrees or

credentials, third: placement and retention in post-secondary education or employment: and fourth: completion of vocational and technical programs that lead to nontraditional training and employment (Brustein, 2006). The core indicators were expressed in percentages or numbers to make sure they are objective, quantifiable and measurable. Funding could be withheld if states failed to meet performance levels. Exceeding their performance level meant that states would be awarded with a new incentive program (Brustein & Krvaric, 2007).

State Administration and Leadership

Education's major challenge in society is the proper preparation of young citizens to take on responsible roles in a democratic society. The failure of society to teach this basic principle of democracy fails to ensure a democratic social system that cannot be maintained simply by the election of government officials (Kelly, 1995). As far back as 1918, a study of vocational education for girls strongly suggested that economic necessity was the main reason that they failed to complete their education. The impact of socio-economic inequality failed to provide vocational opportunities for young women (Kantor, 1986).

Gender equity was a main issue in the Perkins Act. Nontraditional training and employment programs were made available for men and women to acquire high skilled jobs that may not have been traditional career choices. Youth and adults in state correctional agencies were allotted up to one percent of the state's funding to be used for vocational education. Initiatives to render more money to rural areas were in contrast to the large amounts that were designated to urban areas by the previous Perkins Act of 1990 (American Vocational Association, 1998). Local programs were to receive up to

8.5% of the total state allotment if one of the following criteria was met: rural areas, areas with a high percentage of vocational and technical education graduates, and communities that receive decreased funds due to the change in the secondary in-state distribution formula (Gordon, 1999).

The state designated agency decided how to divide the local secondary and post-secondary funds. Understanding that teachers know their students' needs, the Perkins Act mandated that at least ninety cents of every federal dollar appropriated go directly to the classroom (Brustein, 2006).

Political Issues and Trends

Although all students were to be served by Perkins Funds, the impartial distribution of funds is important to eliminate bias and political issues making equality funding apparent when there are different categories of learners (Cremin, 1962). However, Republicans and Democrats had separate ideas about who could benefit from the program. The Republicans were afraid that the focus on specific categories of individuals would narrow the services for the population not part of that special group and this could keep students from enrolling. Democrats were concerned that special needs students would be given too many requirements and, therefore, kept out of the system (Levesque et al., 1995).

Additional money and more attention to special populations became a compromise with instructions for states to be accountable for how they would serve special populations, and how they administered funds to meet gender equity issues. Funds were designated for nontraditional training and employment as a result of these negotiations that nearly eliminated the bill (Levesque et al., 1995).

Professional Development

The new Perkins Law mandated that teachers, administrators, counselors, and other vocational personnel be trained to provide high quality vocational education. No funds were to be used below seventh grade as conservative legislators were concerned that young students would focus on careers chosen by the government. The Perkins Law emphasizes that students are to voluntarily choose vocational and technical education and cannot be forced to acquire a federally funded skill certificate (Sheffler, 1995a). Home school parents were assured that their children would not be denied services of public vocational or technical program (Brustein, 2006). The future of vocational and technical education is dependent upon three factors: demonstration of the effectiveness of the programs, positive results achieved by vocational graduates, and a high level of satisfaction from businesses (Sheffler, 1995a).

North Carolina's Historical Overview of Education

Vocational Education altered the educational process during the 20th century by promoting a skills-based program that was thought to better prepare students for occupational life than the traditional academic programs (Hyslop-Margison, 2000). However, John Dewey (1916) thought vocational education should meet students' needs instead of corporate requirements and equip learners for the challenges of life and chosen occupational roles. Industrial education became a priority on both the national and state level and it also ignited ambitious state government goals to have a trained workforce to promote economic progress (Kantor, 1986). North Carolina was a state fortunate enough to have many gubernatorial leaders that supported educational

initiatives that advanced the academic standing of the state and vocational educational resources.

Luther Hodges recognized that North Carolina's workforce was paid the lowest wages of any state in the country in 1954, and ranked forty-fourth among forty-eight states in per capita income, the same ranking it had in 1929. Governor Hodges helped develop a new business model for the state to improve economy conditions. As a result, higher-paying industries were recruited and workers were better trained (Christensen, 2008). Governor Hodges also led the legislature in 1958 to create a system of industrial education centers that would educate people from farms with the necessary skills to gain industrial employment. These centers would evolve into the state's community college system with 58 campuses under the next educational governor, Terry Sanford (Butler & Watson, 1984).

Governor Terry Sanford focused on how to improve the public schools instead of civil rights issues that were prevalent during his service in office. He insisted that North Carolina did not need a climate of hate and massive resistance, but massive intelligence. Governor Sanford insisted that children were the best investment and worked to raise North Carolina's educational level from the bottom of the state's low ranking of expenditures per pupil in the nation (Christensen, 2008). Tax increases financed the educational programs and diminished Sanford's popularity, but, Sanford was to make sacrifices in the interest of educational progress and for the future welfare of North Carolina's economy. Additionally, he established the North Carolina Fund to fight poverty and promote racial equality across the state (UNC University Libraries, 1963).

North Carolina Governor James B. Hunt Jr. was known as the “Education Governor.” He established the Primary Reading program and Smart Start, raised teacher salaries to the national average, expanded programs for the brightest students by creating the North Carolina School of Science and Mathematics, and began testing regiments producing school report cards that are still in place today (Christensen, 2008). The investment in the state’s educational system was evident in 1992 through 2000 when North Carolina led the nation in student improvement in fourth and eighth grade mathematics. Governor Hunt came to be regarded as a national expert on education with the federal government taking notice of North Carolina’s efforts to improve the education for children in rural poverty with the Smart Start Program (Butler & Watson, 1984).

Educational History in North Carolina

North Carolina is considered a traditionalistic and high accountability state because of its thirty-year track record of raising the quality of education through a variety of mandates, tests, and incentives for improved teacher quality. North Carolina implemented one of the most inclusive accountability systems in the United States called the School-Based Management and Accountability System or the ABCs of Public Education. North Carolina was one of the first states to implement a comprehensive, state-wide accountability plan (NCDPI, 2006). Standardized tests were implemented in elementary schools including an accumulative test. These initiatives evolved as a result of North Carolina’s educational ranking in the bottom half of the United States (Febey & Seashore Louis, 2008).

Accountability initiatives were strengthened in 1989 when the General Assembly passed the School Improvement and Accountability Act which mandated school report cards and End of Grade tests for grades three through eight. The End of Grade (EOG) tests were aligned to the state curriculum and assessed proficiency in reading, mathematics, and writing. With this evaluation system, the state provided each school with a status label and measurement of growth that determined the recognition it would receive. This Accountability, Basics, and Control Plan, or ABC, was the last legislative reform prior to NCLB in 2001. However, it was challenged by the Leandro Decision that cited low wealth districts were unable to give students a sound education (NCDPI, 2012).

Student Academic Performance and Post-Secondary Preparedness

Graduates exiting from secondary public schools need to be prepared for the workforce or post-secondary education. It is vital that each phase of education contributes to the retention of academic knowledge. A students' future educational preparedness may also depend on collaboration between educators and their expectations of academic performance. This ensures graduates' readiness for post-secondary education or employment. If graduates cannot comprehend information and are educationally unprepared, the learning process should be restructured (Griego, 2011). Forty percent of present day graduates, upon entering post-secondary education, are told that they must take remedial education courses (Vandal, 2011). The remediation is important if a student has not completed courses that enable them to pursue further education. It is important to ensure that graduates begin their post-secondary education with knowledge that meets future academic challenges.

Understanding that without basic skills in reading, math, and writing students cannot build an academic foundation of knowledge (Vandal, 2011). Graduates are facing the fact that academic deficiencies restrict future achievement. Career centers concentrate on specific careers using core curriculum content to integrate course competencies that encourage critical thinking skills (Smith, 2013).

For academic success, students should discover how they learn best. Future achievement may depend on the instructional connection between learning styles and academic attainment which should increase with hands-on application of curriculum. To get the message across teachers need to communicate the lesson in a multifaceted way to appeal to a variety of learning styles (McKeachie, 1995). Understanding that student bodies are increasingly diverse in ethnicity and gender, there is also a vast range of individual differences within any demographic group. There should be specialized student attention given to the relational aspects of teaching and learning (Tiberius, 1986).

Lack of academic achievement is characteristic of today's nontraditional student and is used as substantiation to drop out of school. The public schools' answer to the dropout rate focuses on second chances. One such program is remediation which can take several forms including tutoring, support services, and evaluating mastery of remedial work. Through these services non-academic students have a second chance to gain knowledge and skills needed to graduate from high school (Johnson, 2004). Remediation courses are quick, consistent, and cost-efficient, but do not address learning style inadequacies (Education News Colorado, 2011). It is important to remember that the dropout rate is only one indicator of a troubled educational system.

Tests do not take into consideration other factors such as study skills and a strong support system needed for educational success (Education News Colorado, 2011). High schools should have an accepted clear benchmark for academically preparing students. Statewide performance standards enable educators to assess student progress with clear expectations; thereby, decreasing student remediation needs as seen in the states of West Virginia and Florida (Abraham & Creech, 2002).

Research shows that eighty percent of the fastest-growing jobs in the U.S. require some post-secondary education. According to the U.S. Department of Labor, it is urgent that today's student receive adequate academic training as a foundation for post-secondary education or to secure employment (Hecker, 2005). According to recent information, the US will graduate only seventy percent of its students entering high school. That is one of the lowest rates among industrialized nations (Greene & Winters, 2006). Of those graduating, eighty-one percent plan to enter college. However, with almost half of students entering college-needing remediation to function on a post-secondary level, it is estimated that forty-one of them drop out. Weak curricula, vague standards, and lack of alignment between high school content and the expectations of colleges and employers result in the need for remediation (Alliance for Excellent Education, 2006).

The vast majority of graduates who take remedial courses in college do so to gain the skills and knowledge they should have gotten in high school (Alliance for Excellent Education, 2006). In recognition of this educational deficient in public high schools, remediation programs work to decrease the dropout rate with students agreeing to stay in school and retake a course. Remediation has a value within the

framework of education as it plays a significant part in preparing graduates for post-secondary education and the world of work (Alliance for Excellent Education, 2006).

Graduates' Perspectives on Educational Goals

Educational goals for the 21st century include a comprehensive education that aligns with college readiness, careers and civic responsibility. The focus is on 21st century student outcomes that help graduates master the multi-dimensional abilities required of them in the 21st century. Graduates should be able to integrate and apply 21st century skills, technical knowledge, and core academic knowledge (NCDPI, 2012).

As an evaluation tool, the feedback from the Concentrator Feedback Survey gives insight into the career-technical education experience. Surveys that are administered annually collect graduates' opinions about career-technical courses, workforce readiness, and post-secondary education (NCDPI, 2012). The information is valuable to identify best practices and indicators of course competency success or needed improvement. Results from the annual North Carolina Department of Public Instruction Concentrator Feedback Survey reports that fifty-three percent of CTE graduates in 2006 stayed in school to complete their CTE coursework. Only four percent of the graduates reported that they were unemployed which was in contrast to the twenty-one percent unemployment rate for youth that year. Over seventy-eight of the graduates had entered some form of post-secondary education or training (NCDPI, 2006). Graduates reported that the main reason they focused on education was to ensure a good future for themselves. Opportunities for a good job and an investment in their future were all reasons to obtain an education or training. Graduates that wanted to be self-employed thought it to be important to help them get established and have an

advantage in the labor market. Other graduates thought that a good education would enable them to earn a higher wage for their efforts in the workforce (Furberg, 2011).

Personal development was related to knowledge and self-fulfillment for graduates who had life goals and wanted to accomplish something. They thought that knowledge would give them a good foundation to build upon their future (Furberg, 2011). It was seen as a natural step in life once they found their career interest or program of study. Graduates were concentrating on a good future where they could have a successful career and earn money. Education was seen as a challenge and good opportunity for them to get something out of life (Furberg, 2011).

Trade and Industrial Teachers' Perceptions of Students' Education

Research from an article titled *"*A Trade and Industrial Education Perspective*"* indicates that teachers from trade and industrial educational areas agree that graduates who complete trade and industrial (T&I) courses should have attributes that include dependability, honesty, pride in workmanship, punctuality, interpersonal skills. Safe working conditions are also a priority for T&I graduates. Trade and Industrial teachers should teach the proper use of common hand tools and equipment as well as measuring skills (Rogers, 1995). Defining technology education as a pre-vocational program supports the Carl D. Perkins Vocational and Applied Technology Education Act of 1990. Moreover, the Perkins Act is noted for developing extensive academic and occupational skills that promote the United States as a competitor in the world economy (American Vocational Association, 1992).

States have developed an articulation philosophy to connect technology and T&I education. Curriculum changes had to take place to move from industrial arts education

to technology education. The Virginia Educational Department considered the goal of technology education to be the advancement of student learning in preparation for secondary vocational technological skills (Rogers, 1995). The Idaho vocational programs indicated that technology should help students make informed decisions as they advance into vocational programs. Florida's educational system promotes technology education as a basic component to preparing students for second level programs. New Hampshire Department of Education specifies that with state guidelines in technology, students should be prepared to advance into secondary Trade & Industrial educational programs (Rogers, 1995). North Carolina has also increased the trade and industrial courses available for secondary education (NCDPI, 2012). Skills USA competition is hosted in Greensboro each year for high school students to compete in a statewide contest by displaying their skills in welding, brick masonry, electrical trade, digital technology, and plumbing (Skills USA, 2015).

Trade and Industrial education along with Career-Technical education has as its mission to empower graduates to be active citizens and workers in a global economy. The broad spectrum of CTE courses is intended to promote student achievement in the area of basic skills of reading, writing, and math, along with individual abilities that include working independently, or with a team demonstrating the capability of solving problems or using technology (NCDPI, 2006).

What Do Employers Want in an Employee?

The partnership between industry and education benefits all stakeholders including the student. Understanding the characteristics of a good employee helps the

instructor cultivate traits that are desired by employers. Desirable employee traits include leadership, interpersonal and critical thinking skills (Perdue, 2013).

The Science, Technology, Engineering, and Math industries, known as STEM, want teachers to start motivating young students in primary grades to be curious about the world around them. STEM industries need employees who can think. Manufacturing executives strongly suggest that people who can think can be taught anything necessary to perform their jobs adequately (Vigeant, 2015). Furthermore, STEM encourages educators to promote curiosity in elementary school so students will make a conscious effort to think and ask questions. STEM skills contribute to higher order thinking in science, technology, engineering, and math subject areas (Vigeant, 2015). Developing students' soft skills is seen just as important as technical abilities or having a specific skill set. Industry wants employees who have higher order thinking skills and can rise to a challenge and be resilient. Being academic is a crucial quality, but being passionate and asking questions with the right attitude are traits of the ideal employee (Vigeant, 2015).

Every employer searches for a specific set of skills that enable the employee to perform their job adequately. However, some studies have identified numerous critical and essential employable skills that are known as "soft skills." Communication skills, the ability to listen, write and speak successfully are critical in the business setting (Hansen, 2008). Analytical and research skills are also necessary for the gathering of information to identify present concerns. Focusing on streamlining a needed course of action requires highly analytical problem solving. Processing technical skills is a must as most jobs require knowledge and proficiency of computer hardware and software. Employees

who can multitask are of great value in order to prioritize and regulate the completion of current projects (Hansen, 2008).

Leadership is a desired skill that enables employees to motivate others, initiate solutions, and create a productive climate in which employees seek to perform at high standards. Included in leadership is the ability to understand and be aware of diverse cultures. Building rapport in multicultural settings shows strength and professionalism (Hansen, 2008). Furthermore, dedication to completing a task demonstrates a hard work ethic and tenacity. Workers who were willing to be life-long learners adapt to industrial changes, welcome innovation, accept challenges, and will be successful competitors in the global economy (Hansen, 2008).

Although companies have a set of specific employment qualifications necessary to meet their needs, certain employee character traits are desired by all industrial organizations. Characteristics of a good employee include being dependable, trustworthy, and proficient at their jobs. Being prompt, displaying a professional attitude, and commitment with clear expectations have the utmost precedence as employee traits (America's Job Exchange, 2015). Self-motivation is another trait that employers seek understanding that taking the initiative to organize, perform daily activities and deal with problems each business day requires a positive approach. Employers recruit people who have a dedicated work ethic and appropriate social behaviors in the workplace. Maintaining an optimistic approach, good employees should discuss sensitive issues in private to promote working through a difficult situation (America's Job Exchange, 2015). Conscientious employees complete their tasks despite schedule changes and respond by solving problems with critical thinking. Being a team player is a

must with emphasis on those who share successes by praising others for the team's achievements (America's Job Exchange, 2015).

Employees who possess interpersonal skills that demonstrate the willingness to interact with co-workers, solve conflict, and encourage others to contribute in the workplace are invaluable to the employer. Employability skills, professionalism, and personal values are critical traits needed in today's rapidly changing and diverse workplace.

Concentrator Feedback Survey

The purpose of the 1998 Perkins Vocational and Technical Education Act of 2006 was to develop the academic, career, and technical skills of high school students that enroll in CTE courses or post-secondary education. The Act promoted meeting standards that prepare graduates to meet the challenges of high skill, wage, or demanding occupations in industry that are current or will be developed in our economy. Academic Career-Technical instruction was to connect secondary and post-secondary education for graduates (NCDPI, 2006). Additionally, it was to assist state and local districts in providing services, best practices, improve programs, provide technical assistance, promote leadership, improve the quality of CTE teachers, administrators, and counselors, support partnerships among educational institutions, and provide individuals with opportunities in conjunction with training programs the knowledge and skills required to keep the United States competitive (NCDPI, 2006).

Each year students across North Carolina enroll in career-technical education courses that provide exciting and rewarding opportunities such as job training, internships, and apprenticeships that are in their chosen field of study. This is the first

step toward learning about a career that could result in a productive future of employment. Basic skills are part of the program that includes reading, writing, and mathematics, working as a team member, achieving critical thinking skills, and being proficient in technology (NCDPI, 2006).

Approximately nine months after graduation, those graduates who are considered concentrators or completers of a second level career-technical course, are contacted and asked to complete a survey concerning their current post-secondary education, training, or employment status. Concentrator Feedback Surveys are part of the evaluation tools used by the State of North Carolina to clarify and validate graduates' experience in career-technical education and the impact it has had in preparing them for the workforce or further education. The feedback analyzes how well CTE is meeting students' needs. The data assists educators in developing strategies to improve classroom performance (NCDPI, 2006). In the 2006 survey, as well as previous years, over half of graduates reported that CTE courses were one of the reasons that they stayed in school. Of the graduates surveyed, 73% to 87% were continuing their education in various areas of study (NCDPI, 2006).

Over the years the tests progressed from paper and pencil reporting to today's online survey system for students who meet the qualifications of a completer. This feedback provides information concerning their experiences with employment and their educational status. Administrators can use the feedback for strategic planning and required federal reporting (NCDPI, 2006).

Learning Styles

The instructional method in the classroom facilitates the learner's comprehension of the lesson. Different learning styles are present in every classroom; therefore, strategies to address them should be incorporated into the lesson plan. The application of the instruction reinforces what should have been learned and is considered hands-on application in the career center's nontraditional classroom (Tiberius, 1986). For nonacademic students, the exposure to lesson application can support the kinesthetic student's academic success level better than using paper and pencil. The nontraditional learning environment can expose the student to academic success by physically completing the instruction (Gardner, 1999).

Teachers at career centers use different instructional methods than the traditional high school teacher. Students are taught skill-based competencies at career centers which are reinforced by hand-on application with tactile or kinesthetic activities. Students are able to apply what they have learned through a nontraditional style of instruction. Different styles of learning are relevant when considering the identified learning ability of the student (Walling, 2006).

Focusing on graduates, the learning style that is preferred is relative to only one sense. An auditory style prompts a sound response, a visual style denotes a visual spatial response, and a tactile or kinesthetic summons a movement response. Multiple sensory responses can be experienced by the student once knowledge and realization of the primary response is achieved (Walling, 2006).

Records show that in 334 BC Aristotle had observed that children had different skills and specific talents that are termed today as learning styles (Felder & Silverman,

1988). Little research was done to further the differential information; however, significant individual differences surfaced in the early 1900s. Noted differences focused on the connection of memory, visual, and oral instructional methods. As focus changed in education, learning styles gave way to more popular evaluations of intelligence and academic success. In the early 19th century, the passion to discover the human scholastic potential took precedence. However, it was not until the late 1900s that learning styles research reemerged due to professional educators' interest on teaching and learning techniques (Felder & Silverman, 1988).

Although presentation of curriculum influences how students learn, it also determines how learning and teaching interrelates with comprehension levels. Inherited characteristics, personality, and mindsets can affect an individual's learning ability. Each person is born with certain tendencies toward particular styles, but these biological or inherited characteristics are influenced by culture, personal experiences, maturity level, and physical development (Felder & Silverman, 1988).

The developmental abilities of a child change with age. A preschooler's strengths and weaknesses may be different from those of a 10- or 15-year-old child. With perception, organization, and retention also changing, a matured cognitive ability and physiological behavior may influence how the older student perceives, interacts, or responds to the world around him (Felder & Silverman, 1988). Furthermore, research suggests that there are some students who possess brain cells that are absent from other students' cognitive ability. Perception, organization, and retention are components of children's learning styles that are characteristically cognitive with physiological

behaviors that serve as accurate indicators of the learners' perception, interaction, or response to the learning environment (Felder & Silverman, 1988).

The auditory learner absorbs what they hear, the visual learner learns by observing, the tactile learner understands the concept by repeating it with their hands while the kinesthetic learner must physically perform the task to learn the concept. The physical learning style, kinesthetic, uses the body and the sense of touch to learn about the world. It is likely that sports, exercise, and other physical activities like gardening and woodworking would be more appealing to this type of learner. The kinesthetic learner likes to think out issues, ideas, and problems and would rather go for a walk or a run if something is brothering him/her rather than sitting at home (Advanogy, 2004).

A kinesthetic learner uses hand gestures and other body language to communicate. They do not mind dancing when the time is right. A kinesthetic learner likes the physical action of a theme park ride, or may want to avoid them all together. Kinesthetic learners prefer to dismantle an engine and then put it back together rather than reading or following the directions. For this learning style, setting in a lecture is uncomfortable and they may fidget or be unable to sit still (Advanogy, 2004).

The kinesthetic learner prefers to get up and move around. This style includes physical style includes physical labor, mechanical work, construction, repair work, athletics, drama, and dancing. The use of physical objects such as flash cards help the kinesthetic learner comprehend concepts and retain information. Movement can help kinesthetic learners memorize information using writing and drawing as physical activities will aid the student's learning (Advanogy, 2004).

Understanding that people learn differently, physically active students may learn to control their actions with mind over matter. For example, some Russian athletes have for decades used Autogenics, a medical therapeutic technique, for relaxation and self-regulation of the body to increase their physical performance. It gives them more control over their physical state. Instead of fidgeting or being unable to sit still like the kinesthetic learner, they focused on staying calm, centered, relaxed, and aware. Role playing is also helpful to practice skills and behavior; it stimulates thinking and behavior (Advanogy, 2004). Likewise, Howard Gardner's *Frames of Minds: The Theory of Multiple Intelligences,* defined and coupled with tactile abilities compares activities of dancing as performing surgery to require great kinesthetic intelligence. This analogy suggests motion heightens mental ability, as in role-playing or Autogenics (Gardner, 1999).

Kinesthetic learners are thought to be discovery learners. The kinesthetic learner comes to the realization through doing rather than thinking. They may struggle to learn when they only read or hear. The kinesthetic learner is abled by movement (Gardner, 1999).

This increases the students' understanding with kinesthetic learners usually scoring higher when they can move around as they learn. Examples of activities that ensure success for kinesthetic learner include chemistry experiments, sporting activities, art, and acting. They also listen to music while studying or completing assignments. The kinesthetic learner can focus on two different things at the same time. They remember things in relation to what they were doing (Gardner, 1999).

They have good eye to hand coordination and the learning occurs by the learner using their body to express a thought, idea, or concept. In the earlier years of education, kinesthetic learners were thought to have the need for movement due to high levels of energy without which they became agitated, restless, or impatient.

Rita Dunn suggests that tactile learning and kinesthetic learning are basically the same style of learning; however, Galeet BenZion thinks that kinesthetic and tactile learning are different learning styles and have different characteristics. She defined kinesthetic learning as the process that results in new knowledge or understanding with body movement. This movement helps the student to understand and retain new knowledge (Gardner, 1999).

Kinesthetic learning at its best, BenZion found, occurs when the learner uses his own words to define, explain, resolve, and sort out how his body movement reflects the concept explored. One example is to find the sum of two numbers through movement, then explain in space how the movement leads to the answers. While the concept of learning styles is popular among educators, both children and adults express preferences for different kinds of learning; there is no evidence that identifying a student's learning style produces better outcomes. There is, however, substantial evidence that a student will learn best if instructional strategies are used that appeal to that student's learning style (Gardner, 2006).

Well-designed studies flatly contradict the popular meshing hypothesis which states that a student will learn best if taught in a method deemed appropriate for the student's learning style (Gardner, 2006). Proponents state that the evidence of kinesthetic learners benefiting from specialized instruction is at best the diagnosis of

kinesthetic and tactile learning coupled rather than isolated with teachers likely to misdiagnose students' learning styles (Gardner, 2006). Some studies show that mixed-modality lesson presentations using auditory and visual techniques improve student learning in a variety of subjects. Instruction that stimulates more than auditory learning is likely to enhance the learning in heterogeneous student populations (Gardner, 2006). The understanding of learning styles in education is useful for a variety of reasons. Lectures should not just be a predetermined summation of competencies, but a lesson that includes an assortment of active learning techniques that engage students in the shared discussion (Tiberius, 1986).

Although gifted students usually possess auditory or visual learning traits, measureable successes that warrant identification, there are other educational content areas that need to be recognized, understanding that all vocations are needed in an industrialized world. Tactile or kinesthetic learners have the same earning power as visual and auditory learners, but may differ by excelling in labor intensive jobs. Therefore, the way we measure achievement, success, or merit needs to be diverted from the traditional thought that academic intelligence yields significance in primarily the core subject areas.

Research shows that when a child matures the brain develops by initiating change both in learning styles and comprehension (Felder & Silverman, 1988). When instruction is effective, there are multi-sensory approaches that trigger the child's use of numerous senses to learn. This is evident because of the organization of the brain's cognitive abilities. As learning takes place, information follows a pathway for the eyes, the ears, and the hands. With the use of multiple senses the brain is flooded with

knowledge in many ways (Felder & Silverman, 1988). Sandra Rief suggests that "students retain ten percent of what they read, twenty percent of what they hear, ty percent of what they see, fifty percent of what they see and hear, seventy percent of what they say, and ninety percent of what they say and do" (as cited in Shaw, 2000, p. 4). Therefore, this study examined the potential of tactile and kinesthetic instruction as it relates to the increase of student cognitive performance and career readiness. Educators have a mission to teach and equip students with critical thinking skills that facilitate their employability and career success when entering the global market (Musselwhite, 2005).

Nontraditional instruction or hands-on application may be the key for planning future high school coursework that would allow more students to experience success and keep potential dropouts in school. Additionally, students who are not academically gifted through auditory or visual learning may find academic achievement through the application of competencies with nontraditional instruction designed to be more appropriate for students identified as tactile or kinesthetic learners.

In today's world, there is growing diversity among students in terms of ethnicity, gender, nationality, and cultural backgrounds. With so many cultures represented in the classroom, teachers must become more adept in accommodating learning styles. Differences may include older students using their maturity and past experiences as independent and self-directed learners. However, women are known to use empathy, collaboration, and listening in their approach to learning. Research suggest it is known that African Americans and Mexican students are more successful in achieving common

goals by working with others. Within any demographic group, there will be multiple learning styles (Tiberius, 1986).

To understand exactly what information is communicated through our traditional teaching method, we must comprehend how our audience learns. It is known that during a 50-minute lecture, usually seventy percent of the content is remembered by students during the first ten minutes resulting in only twenty percent remembered in the last ten minutes (McKeachie, 1995). To be successful in the communication of the lesson, teachers must deliver the message by multiple strategies that appeal to a variety of learning styles. Sometimes, using a preferred learning style to communicate the message offers self-satisfaction, hoping that the audience learns the same way. However, by using different learning styles, the message will be understood through diverse use of delivery strategies (Montgomery & Groat, 1998).

Some students may be better suited to some tasks, subject areas, and careers than other students. This occurs as a result of differences in personality, talents, and cognitive styles. With the changes that often occur in career areas, established strategies of teaching and learning in a given field may be counterproductive. David Kolb (1981) observed, “Over time, selection and socialization pressures combine to produce an increasingly impermeable and homogenous disciplinary culture and correspondingly specialized student orientations to learning” (p. 234). To this end, the capability of our students will be apparent if diverse learning styles as innate abilities of students are accepted and encouraged.

One’s learning style, career interests, skills, and personality navigates a student’s selection of specific educational coursework. Understanding that students learn in

different ways, it should also be acknowledged that learners bring their own individual approach, talents, and interests to the learning situation (Guild, 2001). Added to those variables are the individual learner's culture, family background, and socioeconomic status, cognitive style, psychological type, and multiple intelligences. Understanding an individual's capacity to learn can be revealed by personality identification. The aspect of personality types can impact the potential of learning (Guild, 2001). Another instrument that helps determine a preferred learning style is the Myers-Briggs Type Indicator (Myers & McCaulley, 1986) which is best known for identifying one of sixteen personality indicators and is based on Carl Jung's concept of archetypes (McCaulley et al., 1983). The personality profile is linked to one of four dimensions: orientation, perception, decision making, or attitude to the outside world. The Myers-Briggs has been used to identify student learning styles in multiple instructional areas. Orientation and perception have implications for learning (McCaulley et al., 1983). University professors prefer abstract thinking which contrasts with students' learning style. Students prefer practical applications and examples that lead to abstract thinking (Tiberius, 1986). The thinking and feeling dimension demonstrates a consistent gender difference with two-thirds of women profiles illustrating that feeling predominates and two-thirds of men profiles showing that thinking predominates. The female gender tends to be influenced by human values and caring. Female students enrolled in male-dominated coursework are more likely to find rational reasoning offensive. Furthermore, male students tend to disagree with the over-prominence of subjective interpretations and personal relationships (Tiberius, 1986).

Personality distinction alerts the kinesthetic learner to their preference of learning by direct experience and by what is done with little knowledge gained by what is said or read. Three areas of Benjamin Bloom's taxonomy of learning, cognitive skills, affective domain, and psychomotor skills influence the kinesthetic learner (Bloom, 2013). The psychomotor domain includes physical movement, coordination, and motor skills. They include perception, readiness to act, guided response, mechanism, complex overt response, adaptation, and origination:

- Perception—using sensory cues to guide motor activities
- Readiness to act—includes mental, physical and emotional readiness, e.g., prepared to act upon a sequence of instructions.
- Guided Response—learning a complex skill through imitation and trial and error; following instructions.
- Mechanism—learned responses become habitual, movements performed with confidence and proficiency.
- Complex overt response—performance of complex movement patterns.
- Adaptation—movements can be modified or adapted to fit special situations
- Origination—creating new movement patters to fit a situation. (Carleton College, "Benjamin Bloom's taxonomy," 2013)

Physically performing the movements of symmetrical actions increases retention for the kinesthetic learner. Students master the concepts through cognitive skills experiencing by motion what is to be remembered. Dance steps performed by pairs of students offer knowledge from which to draw the memory of how and when dance steps or movement is completed (Berghuis, 2012). The required motion by performance or

completion of a task is the best method for the kinesthetic learner to retain information. Using hands-on movement or tactile learning is not as effective as entire body movement. Furthermore, the probability of retaining information from written documents or by auditory learning is minimal and puts the kinesthetic learner at a disadvantage (Berghuis, 2012).

The strengths of a tactile or kinesthetic learner include memorizing what they experience by the use of objects or competencies requiring physical participation. The motion helps them remember how to perform the same task after only one active performance (Berghuis, 2012).

Research shows that learning strategies for the tactile-kinesthetic learner are multiple, varied methods. They include short readings viewing the “part-approach” and then scan pictures, headings, and then reading the first and last paragraphs to understand what the author is trying to convey to the reader.

Fidgeting is a normal symptom of the kinesthetic learner which may explain why movement helps the mind focus by application of a lesson. There are suggestions to help the learner’s concentration that include listening to music without a rhythm-base, and using colored paper to inspire the student, which is referred to as color grounding (Berghuis, 2012). Colored transparencies are helpful in focusing one’s attention on the content. Different colors should be used until the color that helps the most is identified. Numerous study breaks are three to five minutes can be beneficial. New information can be displayed on flashcards, boards, card games, or floor games, strategies which help the processing and retention of lesson content (Berghuis, 2012).

The tactile-kinesthetic learner should take breaks and move around while learning or reciting a lesson, take their own notes, use resources such as computers, video camera, or photography as programs for retention, and take part in activities that review the lesson. While tactile and kinesthetic learners use similar methods to retain information, the tactile learner enjoys modeling, scrapbooking, artistic creations, and games, whereas the kinesthetic learner enjoys projects, demonstrations, dance, science labs, field trips, and role-playing (Berghuis, 2012).

Kinesthetic learners can retain information by working in teams. Rolling a sleeping bag can be done in sequence with one student acting out the movements while the other student records what is done. The order of the words may prompt the student to retain information when written to include first, second, then, or next. The words help generate the movement that in turn signals the next step. The movement and speech is the stimulus that becomes the text for the student (Walling, 2006).

Implications for Teaching

Although it is difficult to provide multiple ways of teaching for every student, educators should attempt to provide a variety of learning experiences in the hope that every learning style will be addressed (Tiberius, 1986). Activities that are engaging should include applications that will aid the sensing student to comprehend the abstract concepts while repetitive and open ended problems should be solved by both the intuitive and sensing student. Additionally, individual and group work is effective for extroverts and introverts. The goal is to reach all students without depending exclusively on any one particular activity (Tiberius, 1986).

Educators should convey knowledge with strategies that address diverse learning styles to motivate students to gain information about their career choices. Connecting information with examples from today's world creates a more relevant lesson.

> Felder advocates a balance between the extremes in each learning dimension. Course should include providing a context for the concepts addressed; connections with relevant material from experiences; balancing theory and models (intuitive) with demonstrations and examples (sensing); using pictures, sketches, and diagrams (visual) to supplement verbal information; using numerical as well as algebraic examples (sensing, inductive) to illustrate abstract concepts (intuitive, deductive); and providing time for both student participation (active) and reflection on the material presented (reflective). (Felder & Silverman, 1988, p. 78)

Kolb's model illustrates learning styles and the learning cycle. The question "Why?" is offered by the Divergers, or students interested in social science and the humanities. They enjoy motivational stories, group discussion, group projects, subjective tests, and field trips. The Assimilator wants the question "What?" answered and prefers lectures, textbook readings, independent research, objective exams, and demonstrations by the instructor. The Convergers ask "How?" and are interested in homework problems, computer simulations, field trips, individual reports, and demonstrations. The Accommodators ask "What if?" They are interested in open-ended problems, student presentations, design projects, subjective exams, and simulations (Tiberius, 1986).

The educational process has the capability to highlight the differences and aptitudes between groups of students. Kolb's research reveals that over time science students become more analytical and less creative, with art students becoming more creative and less analytical. By addressing all learning styles, the instructor can be sure

that all questions have been answered including “Why are we learning this?”; “What are the key points of this issue?”; “How do I use this knowledge?” and “What are the implications of this information in other contexts?” (Tiberius, 1986).

Students tend to behave more independently when they are confident of their ability to perform (Randall, Buscher, & Swerkes, 1995). The learning styles analysis has contributed to identifying some potential problem areas in the academic program and could be followed up with more detailed focus surveys with target student groups (Grasha, 1996).

A characteristic of systematically approaching learning styles is to develop a corresponding log of teaching styles based on actual classroom behaviors. When the teacher understands the social dynamics of the classroom, learning and teaching styles can be combined to accommodate learning preference. All learning styles cannot be accommodated, but the instructor being aware of how the students learn pair’s lessons using a variety of strategies (Grasha, 1996). Providing opportunities for small group discussions to engage the collaborative learner, adding open-ended questions to engage the independent learner, and providing the dependent learner with alternatives assessments, are examples of assignments that would accommodate a variety of learners. Encouraging teachers to identify and accommodate learning styles can strengthen learning deficits. With consistent and focused guidance by identifying and understanding one’s learning style, the dependent learners can develop strategies for independent learning (Grasha, 1996).

Ultimately, there are issues in student learning that need addressing, not the least of which is to identify and address teacher and student disagreements, but also to

solve problems challenging the student's comprehension. Awareness of the issue and concentration on the problem empowers the student (Grasha, 1996). Empowering the student may be an explanation and vital part of the student dropout problem that plaques our high schools. The realization of their learning style and the potential for achievement promotes enthusiasm motivating the student's innate ability to increase achievement levels (Randall et al., 1995).

Neither styles of learning nor teaching are absolute; changes can be made, adapting to the needs of students and classroom climate (Grasha, 1996). Learning styles can be expanded and mastered if teachers use a range of teaching styles to accommodate diverse students. Class activities that are used for competency mastery can modify and expand learning style choices (Grasha, 1996).

Matching the instructional methods to the student's learning style does not always solve classroom problems. There is also a concern of motivation, gender, classroom climate, background, and multicultural issues. These classroom components usually influence the potential for learning (McKeachie, 1995). The gage of student attainment can be influenced by the benefits of multiple learning styles if the teacher is self-reflective and prepares activities that reward and enhance student achievement (McKeachie, 1995).

Technology

In 1946, the first vacuum-based computers were created at universities and used by schools in the 1950s along with televisions to support learning. In the beginning, computers were used to store information due to the lack of computer programs for teacher-student instruction. Apple developed the first personal computer and donated it

to schools, but acceptance was ill-fated due to incompatible mainframes and technologies. The personal computer did not become a systematic piece of educational equipment until the 1980s when it was endorsed as a method of teaching (Nicholas, 2013).

Education has accepted technology as a form of instruction since the 1990s using computer games, educational software, and improving the presentation of information to engage diverse graduates who have visual, kinesthetic, and auditory learning styles. The extension of the traditional classroom through the use of media technology aids in the retention of knowledge and mastery of the core curriculum (Nicholas, 2013). Additionally, teacher resources are available in the form of PowerPoint presentations, projector screens, smart boards, graphics, videos, and games. Interactive lessons supplemented by online libraries offer limitless instructional references (Nicholas, 2013).

A most productive strategy that promotes self-efficiency includes using the computer to teach students how to secure and retain information via the internet. This is considered a social shift from teacher-student relationship to student-computer involvement. Technology enhances classroom instruction with the availability of the largest, fastest growing database of current resources aligned with the advancing age of the Internet (Nicholas, 2013).

Technology is possibly an array of tools that might prove helpful in advancing student learning and may be measured in how and why individuals behave. It can include material objects like machines or hardware and encompasses systems of

methods of organization and techniques. Smart phones, games, and other hand held devices increase learning potential for students (Nachimuthu, 2011).

In the 1960s, Seymour Papert, a professor at the Massachusetts Institute of Technology, collaborated with Swiss psychologist Jean Piaget to create the Logo programming language. They presented the program to their students with the intent of teaching students how to manage their learning environment. Students learned how to write and debug programs by the movement of a turtle robot. The students became more deeply engaged in learning, retention of geometry concepts increased, and they were motivated to more intensely concentrate on lessons than was experienced in traditional classroom settings (Vega, 2013).

Michael Warren and a team from SRI International offered criteria of technology that increased children's ability to learn. The four criteria included active engagement, participation in groups, repetitive interaction and feedback, and links to real-world settings. Delivering of new concepts in learning is facilitated by social media that connects the learner to digital gaming, simulations, and social networking (Vega, 2013). Education becomes fun and personally competitive as students strive to keep up with their peers, learning new concepts in technology without formal instructional methods.

The Department of Education outlined a vision in November 2010 for a National Education Technology Plan. The Plan states that its vision is "to leverage the learning sciences and modern technology to create engaging, relevant, and personalized learning experiences for all learners that mirror students' daily lives and the reality of their futures" (U.S. Department of Education, 2010, p. 8). Technology is envisioned to be used for the empowerment and self-directed learning of standards and as an

effective means of communication that continually delivers information in a fast-paced society (Vega, 2013).

Career-Technical Education

North Carolina (NC) Career-Technical Education has made a huge impact on education in 1,300 public high schools and 1,700 community colleges enrolling over 14 million students in career pathways. Part of the Perkins Law stipulates that CTE must continually examine its educational success. Currently CTE programs enjoy a ninety percent graduation rate for graduates who concentrate on CTE programs (NCDPI, 2010). In direct comparison is the average national rate of seventy-five percent. Seventy percent of CTE graduates stayed in CTE post-secondary education to pursue a four-year degree program; this exceeds the fifty-eight percent state average set by graduates (NCDPI, 2010). With experts estimating forty-seven million jobs becoming available by the end of 2018, only one-third will require a two-year degree, with all needing some kind of skill training through CTE.

Work-based learning, a component of Career-Technical Education as well as trade and industrial secondary courses, drives innovation and world-class performance, along with advisory committees, student internships, teacher externships, and workplace experience promoting communication between employers and prospective employees (NCDPI, 2010). The federal initiative of Investing in America is authorized by the Carl D. Perkins Career-Technical Education Act of 2006. This funding enables CTE to meet the challenges of industrial development, student achievement and competiveness in a global economy (NCDPI, 2010).

The state initiative, Common Career Technical Core (CCTC) sets rigorous, high-quality standards for CTE, qualified by state and industrial standards. These standards were developed by industrial professionals, teachers, administrators, and researchers. Together these experts created a set of standards for individual career pathways of sixteen clusters that define knowledge students must have to complete instruction in a program area of curriculum. The career practices must include twelve statements of knowledge, skills and dispositions vital to becoming career ready (CCTC, 2013). “CTE Works for America” is a logo adopted by forty-nine states to support the positive growth of America’s industry and economy. CTE programs in high schools and post-secondary institutions are transforming American expectations by leading change. Components of that change include developing a skilled workforce prepared for the increased demand of the future workforce, improving the educational experience for high school and college graduates, helping to decrease the dropout rate by making students aware of career choices and improving student achievement (NCDPI, 2010).

Career Centers

The industrial component of Career-Technical Education has relocated to career centers where trade and industrial courses are offered. Robeson County’s Career Center Trade and Industrial Education was designed as a secondary program to prepare graduates for careers in public service, industry, and the trade occupations through a sequence of learning experiences (Grissett, 2013).

Instructional units are provided in the use of layout, design, production, processes, assembly, quality control, maintenance, and service of industrial, commercial, and residential goods and products (Grissett, 2013).

As a component of workforce development education, trade and industrial courses provide graduates with the opportunity to advance in a wide range of occupations and post-secondary education (Grissett, 2013).

The major industrial areas are construction, manufacturing, transportation, communication, and public services. A balanced program of classroom study and practical work experiences produces competent workers who can manage resources, work cooperatively, organize and use information, understand complex systems, and apply appropriate technology. Cooperative education, internship, and apprenticeship experiences are available through trade and industrial education program (Grissett, 2013).

Opportunities to develop and apply interpersonal leadership as well as social, civic, and business-related skills are provided through Skills USA, the vocational student organization for trade and industrial education. As an integral part of the trade and industrial education program, Skills USA activities enhance classroom instruction through leadership and teamwork activities. These activities directly relate to the major objectives of trade and industrial education (Grissett, 2013).

North Carolina Career Centers

Tech centers, technology centers, technical centers, career centers and career-technical (CT) centers all have a common purpose. They provide high-quality career-technical studies to high school students. Attendance may include only a portion of the school day, week, year, or full time. Both academic and technical instruction is offered at the center (Droessler, 2014). There are a few career centers in North Carolina that support their local LEA with T&I courses off the main campus. These schools are

located within a school district with instruction of CTE classes whose students take their core classes at their base school. The instruction is for half of the school day causing students to be bused back and forth to their base school during the school day (Droessler, 2014).

At the present time, there are approximately nine North Carolina Career Centers. They are located in Robeson County, Asheville, Winston Salem, Caldwell County, Mooresville, Greensboro, North Wilkesboro, Lincolnton, and Statesville. This is a very small number of career centers in comparison to other states (Droessler, 2014). However, the reason North Carolina has only a few technology centers may be explained by examining five innovative North Carolina educational programs. First, North Carolina has focused on creating comprehensive high schools that have core subjects as well as a variety of career-technical education courses. This eliminates the need to bus kids between schools to take CTE courses (Droessler, 2014).

Secondly, North Carolina has a great community college system where high school students can take free college courses prior to completing secondary education. Students have access and are exposed to technology courses at the college level where they are invited to attend classes on the community college campus as part of the Dual-Enrollment Program (Droessler, 2014). Students can earn college credit in the Dual Enrollment Program which was expanded to include secondary students in the Computer Information Systems, Allied Health, Business Systems Technology and Drafting and CAD Technology. In 2009–10 students spent over 411,000 clock hours in the Dual Enrollment Program saving approximately $1 million in tuition costs. North Carolina also offers dual enrollment along with the Huskins Program that allows a high

school student to earn college credit. Multiple programs of educational initiatives attract students and facilitate graduation (Robeson Community College, 2012).

As a third alternate to attending a technology high school or career center, through the Bill and Melinda Gates Initiative, North Carolina has more early colleges than any other state. There are over 75 early colleges on college campuses across North Carolina allowing high school students to take career courses at college facilities. With some early colleges accepting students from multiple counties, students are accepted to the program based on their GPA (Grade Point Average) and a personal interview. They graduate tuition free with an Associate's Degree by their 13th school year (Robeson Community College, 2012).

Fourth, North Carolina New Schools (formerly The New Schools Project) worked with NCDPI to create the Northeast Regional School of Biotechnology and Agriscience, a school that draws students from five counties. More regional schools are planned to offer courses in these technology-driven advanced science fields. These technology schools are created within the realm of technology high schools, but denoting specialized areas of instruction (Droessler, 2014).

A fifth and final reason for North Carolina's few technology high schools or career centers is the choice of differentiating magnet schools. In these educational institutions, students have the option of choosing career-technical coursework based on that schools offering of CTE programs. The students' chosen field of instruction determines which high school they prefer to attend (Droessler, 2014). Specializing magnet schools offer choices to high school students focusing on specific technology careers.

SREB (Southern Regional Education Board) refers to these centers as "technology centers" and has a special program similar to the High Schools That Work (HSTW) program called Technology Centers That Work (TCTW). The Technology Centers That Work (TCTW) school improvement initiative was formed in 2007 to help shared-time centers review and implement the actions needed to produce high-demand, high-wage graduates who will be leaders in their selected careers. The network now includes more than 180 sites in 18 states (SREB, 2014).

North Carolina career centers have numerous educational opportunities for students interested in trade and Industrial courses. The courses are relevant to today's economic demands of industrial employment deficits, but also give a jump start to a student's career experience. The student internships and certification tests, that are part of the T&I curriculum, help the student transition into the world of work upon graduation. The T&I schools are included in their educational district's listing on the NCDPI website without being distinguished as trade and industrial career centers (NCDPI, 2010). A few career centers located in North Carolina were mentioned for their comparison and similarity to Robeson County's Career Center.

Robeson County Career Center

The Robeson Career Center originated in the mid-1970s operating out of a vacated school building just off State Highway 74. At that time trade and industrial courses were confined to a single campus. Five city school systems merged in the 1990s. Then and now the career center supports state initiatives that prepare students for college and the world of work in industry and trade (Smith, 2013).

The Robeson Career Center had its challenges in the early years with the busing of students; however, with the emergence of the technology age, boundaries were reduced. The importance of Career-Technical education in fulfilling the needs of the industrial demand proved relevant to securing a positive economic future for individuals, business, and industry (Smith, 2013).

Currently there are 11 T&I courses offered at the Robeson County Career Center. Each course has a second level course that precedes certification testing which awards the student with a credential for employment upon graduation. Certification tests taken upon the completion of trade and industrial's second level courses offer state or national credentials that are accepted and recognized throughout the United States.

Automotive Service Technology offers skills in the area of automotive operation and repair, and preparing for work in the transportation industry. Topics include engine theory, automotive service, preventive maintenance, brake repair, electrical systems, troubleshooting, safety, test equipment and measuring. Students can receive Maintenance and Light Repair (MLR) certification or ASE (Automotive Service Excellence) certification (Perdue, 2013).

Computer Engineering I & II Technology teaches skill sets for entry-level PC service. Technicians are taken through an intense hands-on Computer TIA A+ hardware certification standards. Students demonstrate basic knowledge of installing, configuring, upgrading, troubleshooting, and repairing. Students can receive Computer TIA A+ certification and international certification credentials (Perdue, 2013).

Construction I & II provides an opportunity for students to learn about the work and the technical aspects of construction while engaging in a yearlong hands-on project

to construct a 1,100-square foot house. Topics include safety, measurement, tool identification, selection, and use of tools, equipment, lumber, materials, and fasteners. Students can receive Occupational Safety Health Administration (OSHA) certification and the National Center for Construction Education and Research (NCCER) certification (Perdue, 2013).

Welding Technology teaches industrial and construction welding practices and occupational characteristics. Topics include safety, tools, print reading, measurement, thermal cutting processes, base metal preparation, and shielded metal arc welding (Perdue, 2013).

Architectural Drafting Technology uses simple and complex graphic tools to teach students the art of communication and how to understand ideas and concepts found in the areas of architecture, manufacturing, engineering, science and mathematics. Students study problem solving strategies, sketching, geometric construction techniques, CAD (computer-assisted design), orthographic projection, and 3D modeling (Perdue, 2013).

Electric Trades Technology teaches residential wiring, electrical installation and service, hands-on projects that include basic electricity, electrical construction codes and practices, the National Electrical Code (NEC), the use of test equipment, and electrical hand and power tools. NCER modules are included (Perdue, 2013).

Masonry Technology guides students through NCCER modules to teach them a crafted skill. Students are engaged in a rigorous course of study that covers safety rules, construction math, the use of hand tools and power tools, blueprints reading,

communication and employability, measurements, drawings, specifications, and mortar and installation techniques (Perdue, 2013).

Motorsports Technology students explore many job opportunities while learning basic skills used in the motorsports industry. Students learn skills used in fabrication, welding, machining, paint/body finishing, performance, safety, trackside testing, and detail measuring. In the classroom students' use of science, mathematics, critical thinking and leadership are reinforced (Perdue, 2013).

Plumbing Technology curriculum consists of classroom and lab study which focuses on an introduction to the trade, safety, plumbing math concepts, and installation and servicing techniques of many types of plumbing pipes, valves, fittings, and faucets (Perdue, 2013).

Digital Media Technology provides a broad-based foundation in the digital media field with emphasis on audiovisual media technologies, non-linear editing, product development, design, and career development. Communication, mathematical knowledge and critical thinking are strengthened through hands-on projects such as short movie productions (Perdue, 2013).

Network Engineering I & II courses utilize scenario-based learning techniques with students working in a simulated network environment for a web services company. As they move through this environment, they perform hours of hands-on activities where they gain the skills needed to design and maintain networks, install cabling, and configure routers and switches. Students can earn Cisco Certified Entry-Level Network technician (CCENT), or an international certification (Perdue, 2013).

Winston-Salem Forsyth Career Center

The Winston-Salem Forsyth Career Center has, for over 30 years, served as an extension of the regular high school program. Students complete the career center course traveling to and from their home school each day. Advanced placement, career technical, and regular curriculum courses are offered in a challenging academic setting that provides unique learning opportunities (Winston-Salem/Forsyth County Schools, 2013). It also offers extended day classes, which are classes held after school that allow students to “make up” a failed class in order to graduate. Students come from the ten main high schools of the Winston-Salem/Forsyth County School system. Students spend about half a day at the career center, either in the morning or afternoon, taking one or more advanced placement or career-related classes. Bus transportation is provided to and from schools, with some students driving themselves (Winston-Salem/Forsyth County Schools, 2013).

Over 1,000 students are enrolled in advanced placement courses and 750 are enrolled in career-technical courses. Another 150 students take specialty courses offered as part of the regular curriculum. Although primarily juniors and seniors, there are some underclassmen that take a select number of courses such as AP World History, Japanese, Chinese, AP Chemistry, AP Environmental Science, and AP Human Geography (Winston-Salem/Forsyth County Schools, 2013). The career center offers more than thirty advanced placement courses in a variety of academic areas. Advanced placement courses, taught on the college level, provide preparation for college-bound students. Students may earn college credit for these courses (Winston-Salem/Forsyth County Schools, 2013).

Over sixteen educational programs are offered at the career center. These are designed as multi-year programs and consist of both classroom and laboratory components. Students gain hands-on experience in career fields, with learning experience in internships, apprenticeships, and service learning opportunities. Articulation agreements with area institutions help students earn college credits while gaining knowledge through special interest clubs/organizations and extension activities (Winston-Salem/Forsyth County Schools).

Students attending the Winston-Salem/Forsyth Career Center were asked why they wanted to be a part of two high school communities and why over 2,200 students chose travel to the career center. The students stated that the career center is the best place to prepare for their college or career path. The students stated the career center's quality of instruction, diversity of classes, and breadth of courses offered is unmatched. The career center's students have great benefits, including the opportunity to meet like-minded students from other schools across the county. They also enjoy the break in their daily routine during the travel period (Winston-Salem/Forsyth County Schools).

Winston-Salem Forsyth Career Center benefits for its students include earning college credit, building career-technical skill proficiency, enhancing home high school experience, meeting students from other high schools, having flexible schedules, and enjoying special opportunities including internships, apprenticeships, service learning, clubs, organizations, and extension activities (Winston-Salem/Forsyth County Schools, 2013).

The number of advanced placement and career tech courses accompanied by quality instruction is unmatched by other centers throughout the state. Many of the AP

teachers serve as College Board consultants. The career technical educators bring experience as masters in their fields. Success on AP and VoCats exams indicate career center positive student results. The advanced placement students consistently perform above both state and national averages (Winston-Salem/Forsyth County Schools, 2013).

Union County Career Center

Union County Career Center in Monroe, North Carolina is one of thirteen high schools in Union County Pubic School District. It is a public school serving 815 students in grades 9-12. There are fifteen students per teacher with one-hundred percent of students receiving free lunch (U.S. News & World Report, 2013). Union County's Central Academy's Information Systems program is designed to develop skills in specific areas of computer technology. Students who enjoy hands-on learning will benefit with their analytical skills. All facets of computer networking or technical repair are included in instruction (U.S. News & World Report, 2013).

Medical Sciences Academy is a four-year program of study in the medical science field of technology. Students can choose to specialize in Medical Science, Biomedical Science, or Biotechnology (U.S. News & World Report, 2013).

The Central Academy's Dance and Theatre Arts program facilitates a professional lifestyle in the performing arts.

The goal of the Pre-Engineering Academy's four-year program of study is to provide an overview of engineering and engineering technology. Students use problem-solving skills to tackle real-world engineering problems in the academy's engineering and engineering technology program. Students develop critical thinking skills through

hands-on project-based learning, preparing them to take on real-world challenges. The Academy's Teacher Preparation program focuses on teaching as a profession, human growth and development, curriculum, and instruction (U.S. News & World Report, 2013).

In the Transportation Systems Academy, students choose between the Collision Repair Pathway and Automotive Repair Pathway. Hands-on industry recommended training is used in technical and problem-solving skills to perform diagnostic evaluations on current industry-standard automobiles (U.S. News & World Report, 2013).

Caldwell County Career Center

In 1996, Caldwell County business, industry, government, and educational leaders met to solve problems that plagued their county. Three main problems were identified: high dropout rate, the need for high-tech training for the industrial and business workforce, and the fact that eighty-five percent of the students in three high schools had no plans for post-secondary education (Caldwell County Career Center, 2011). These community leaders developed a plan to bring world-class training and education to their students. Four educational areas were identified Business/Computers, Furniture Manufacturing, Building Trades, and Industrial Maintenance Technology. The concept for the new educational plan was to focus on workplace values and ethics; shared faculty, facilities, and curriculum resources among college, public schools, and industry; career guidance and job placement; emphasis on contextual learning through work-based learning experiences; and involvement of the at-risk student population to reduce the dropout rate. A local bond referendum for $2.6 million was passed to build the facility (Caldwell County Career Center, 2011).

High school students who enrolled were scheduled for three years at the career center in the same cluster area of study. During their sophomore and junior years, they would study levels one and two leaving their senior year to earn course credits through apprenticeships or internships at area businesses or industries. The students would be highly trained in all of the basics related to their field and would earn credits that would count toward a post-secondary certificate, diploma or degree. Opportunities included choosing employment, continuing their apprenticeship, or continuing studies at a college (Caldwell County Career Center, 2011).

The start of the Caldwell County Career Center was significant for four reasons. First, it was developed by business and industrial leaders who wanted to support education by better preparing students for productive careers. Second, it was a collaboration of educators, local government, industry, and community leaders. Third, it took career-technical education to a new level by increasing high school technical credits for graduation requirements. Fourth, it developed a powerful consortium of diverse stakeholders in the design of the career center initiative (Caldwell County Career Center, 2011).

In 2007, the Caldwell County Board of Education changed the name of the Caldwell County Career Center High School to the Caldwell Career Center Middle College. Furthermore, the STEM program of study was introduced with engineering technology and has grown to include all phases of biomedical sciences (Caldwell County Career Center, 2011).

The Caldwell County Middle College challenges students to step up to rigor, connect theory to application, and prepare for post-secondary credentials that lead to 21st Century careers (Caldwell County Career Center, 2011).

South Carolina Career Centers

There are fifty-nine career centers listed on the South Carolina Department of Public Instruction's website. The South Carolina Legislature has obviously been very supportive of Career-Technical education which will help build the economic future of South Carolina. As South Carolina's workforce increases, jobs will be needed to employ the graduates (SCSDE, 2013).

South Carolina's standard of living is low compared to other states; therefore, low wages and a large skilled workforce will attract industry to this state. It has taken years of educational planning and financial investment, but the economic benefits for South Carolina include a larger tax base, low unemployment, and economic growth (SCSDE, 2013).

Seventeen of the career centers have committed to Goals and Key Practices of High Schools That Work. The Goals and Key Practices of High Schools That Work are incorporated into the long-term school improvement initiative designed for career and technology centers. The purpose of the career centers is to expand student opportunities to learn rigorous academic and technical content, create supporting relationships between students and adults, work as teacher advisors with students, parents, and home high schools, and provide professional development aligned with school improvement plans (SCSDE, 2013).

The goals of the South Carolina Career Centers are to increase to 95% the students who graduate on time, implement policies and leadership initiatives to sustain continuous school improvement, and work with feeder middle and high school students to complete a CTE program that meets career and college readiness standards in reading, math, and science (SCSDE, 2013). Goals also include increasing the percentage of career center students who complete a career concentration and enter employment or post-secondary education, increase the percentage of students earning post-secondary credit while enrolled in high school, and increase the percentage of students who earn an industrial credential (South Carolina State Department of Education, 2013).

The results of these centers pertaining to post-secondary transition have recently shown an increase with 1,684 completers, an average of 112 graduates per center with 31.5% entering technical college and 38.5% taking remedial courses. South Carolina Career Centers will continue to focus on planning, professional development, practice, performance, patience, and persistence in the coming years (SCSDE, 2013).

Dillon Technology Center

As with any educational process, best practices are identified with any successful program. Some career centers boost increasing enrollment numbers and graduation rates. One of South Carolina's most successful career centers is located in Dillon County. The South Carolina School-to-Work Transition Act requires educators to help students explore careers and encourages employers to participate actively in the education process as a way of investing in their own future workforce. Service learning students can apply classroom knowledge and skills in real world situations through a

community service project or school project (Dillon County Technology Center, 2013). Projects may include mentoring, job shadowing, internships, cooperative education, and career awareness and exploration (Dillon County Technology Center, 2013).

Students can plan projects with their instructor in their field of study. The 34 career courses that are offered at Dillon Technology Center are meeting the demands of the 21st Century with a surge of industrial skills provide by a state of the art career center (Dillon County Technology Center, 2013).

Tennessee Technology Centers

Tennessee is another example of a state that offers opportunity for student careers in trade and industry. Tennessee has 27 post-secondary technology centers supporting a stronger workforce initiative as described below:

> The Centers have offered individualized, nontraditional, and innovative training to enable citizens to enter high-skill and high-wage jobs ranging from computer information technology to practical nursing, to precision machining. The hands-on training model, along with their student-centered approach, makes the TTC's completion rates among the best in the country. (Tennessee State Board of Education, 2012, p. 26)

Virginia Career-Technical Education

Similar to North Carolina's CTE program, Virginia's Career-Technical education has 16 career clusters offering credentials in all areas. Virginia's Board of Education has over 350 credentialing examinations approved to help graduates show their job-related skills and knowledge. The total number of credentials earned by graduates has seen an increase from 2008 of 19,842 to over 67,000 in 2012. The work-based learning methods of instruction include job shadowing, mentorship, service learning, internship, clinical experience, student apprenticeship, and cooperative education. Career and educational programs are designed to prepare graduates to become productive citizens and meet

the commonwealth's demand for skilled and industry-certified technical workers (Virginia Department of Education, 2012).

Summary

A career center is a good alternative to traditional schools, with different dynamics in career-technical education, which allows a diverse learner to apply what can be learned with physical activity (Smith, 2013). Additionally, delivery of current education is offered by multiple options whether it is available at a traditional high school, a trade and industrial career center, or a technical high school. Informed choices can benefit students as schools are becoming diversified offering skill training, classical training, schools within schools, and specific pathways or schools that prepare students to transfer to other educational institutions (Smith, 2013). As students assess their individual abilities, talents, or aptitudes, educational options allow them to prepare for a career and then connect with industry or transition to post-secondary education (Smith, 2013).

Career centers can also deliver education in multiple ways. Some combine core curriculum with career-technical education. Union County, Winston-Salem, and Dillon, South Carolina, all offer educational choices with instruction by multiple strategies. Charter schools, military schools, and classical schools offer a diverse range of career courses (Smith, 2013). Students have the opportunity to choose a delivery system that meets their needs and interests in an expanding repertoire of secondary education.

Career centers concentrate on specific career areas using core curriculum content to integrate with course competencies that encourages critical thinking skills. The practical application of problem solving skills for career center students may

increase VoCats scores in other career-technical education courses. This increased retention gives students a reason to stay in school by connecting the student with a career interest, allowing the student to perform activities in a simulated workplace setting, reinforcing cognitive abilities and problems solving skills (Smith, 2013).

There can be enormous benefits, including the prevention of dropouts, to connecting students with career goals. For example, a student may find interest in automotive mechanics and learn that completion of the course would award credentials for a higher paying job upon graduation (Smith, 2013). Therefore, the student may strive to complete school and use the course certification to begin immediate employment. Post-secondary education would be an option that permits the student to continue learning as automotive technology becomes a valued skill. Furthermore, computer skills will continue to be needed as technology becomes significant in the automotive industry. Therefore, as technology changes, graduates of the industry must become life-long learners (Smith, 2013).

The legislatures at both the state and national levels value the educational initiative of Career-Technical Education, which advances recognition of career centers for potential industrial growth. The economic impact that can benefit the county, state, employees, and employers by the credentialed students that attend career centers is promising. Students learn academic curriculum while developing social skills during internships in the community (Smith, 2013). The educational instruction is reinforced with part-time jobs.

Gardner intelligence, a theory on emotional intelligence, lends itself to multiple intelligences and talents that identify abilities. When nurtured, this helps students to

reach their innate potential (Gardner, 1999). Human intelligence comes in various forms and is associated with multiple learning styles; therefore, students must be exposed to a diverse learning environment to engage their most affective learning abilities. Exposure to diverse instruction provides natural abilities the opportunity to develop and mature. With the knowledge from core subjects, a student can apply math or science with trade and industrial competencies to generate cognitive thinking (Gardner, 1999). Developing the whole student, talents and abilities coupled with knowledge and application promotes intellectual growth and produces a skilled professional.

Education has evolved from the 20th century offering options such as early college, charter schools, magnet schools, classical schools and technology high schools where students can choose to prepare for secondary education or a career. Today education has exciting options unlike years ago when a single campus was the only choice (Smith, 2013). Parents and students can explore secondary educational options at various learning institutions that offer numerous opportunities that facilitate a 21st century career.

Parents must be positive when helping students decide to enter industrial careers. Negative images of manual labor have caused people to avoid industrial jobs and resort to academic coursework at four-year colleges. Without industry, our economy will cease to provide the conveniences that we have grown to enjoy like safe bridges, indoor plumbing, air-conditioned homes, and paved roads (Rowe, 2011).

This study examined the assumption that career centers enable and strengthen public education to meet the ever-changing economic demands of the 21st century.

Most importantly, this study provided a vision of educational growth that is obtainable through application of competencies taught by career-technical courses.

Preparing trade and industrial graduates to meet the workforce demands of a global economy, technically advanced occupations, and fill a void in the industrial world will strengthen Robeson County's workforce, attract industry, and graduate productive citizens that contribute to Robeson County's local economy.

CHAPTER 3: METHODOLOGY

The purpose of this study was to assess how graduates, educators, and business professionals perceived that the trade and industrial education at the Robeson County Career Center prepared students for completion of post-secondary education or employment.

This chapter gives an overview of the methods used to conduct this study. This section includes the purpose of the study, study questions, participants' description, setting, procedures of data collection, validation of instruments, data analysis, processes, statistical analysis, and instrumentation to be used in accessing the responses.

The study utilized results from the Concentrator Feedback Survey (NCDPI, 2013a) to examine Robeson County Career Center graduates' perception of their potential to be employed or pursue post-secondary education. The study also analyzed the Robeson County Career Center teachers' perception of the students' preparedness for the workforce after completing trade and industrial nontraditional coursework or credentialing. Additionally, the study elicited perceptions of the value business professionals placed on trade and industrial educational training for employees and if this provided a significant advantage in gaining employment.

As indicated in the literature review, career centers have a diverse range of courses supplemented with components of work experience that prepare the student to transition to the workforce or post-secondary education. Comparison of graduates', teachers', and business professionals' perceptions may help determine how well graduates were prepared for employability or post-secondary education. The study

hopes to determine whether the graduate possessed the job ready skills to enter the workforce or post-secondary education.

This study used survey methodology utilizing the Concentrator Feedback Survey (NCDPI, 2013a). The Concentrator Feedback Surveys, mandated by the NCDPI, track the post-secondary education and employment of Career-Technical Education graduates. Perceptions of Career-Technical teachers or business professionals that hire trade and industrial graduates were assessed as to any advantage gained by the employment of skilled or certified graduates. These three data points were analyzed to answer the questions in the study.

Study Questions

The focus of the study included the following questions:

1. To what extent did graduates perceive that the trade and industrial courses taken at the Robeson County Career Center contributed to their employment potential?
2. To what extent did graduates perceive that the trade and industrial courses taken at the Robeson County Career Center added to the post-secondary educational potential?
3. To what extent did Career-Technical educators at the Robeson County Career Center perceive that graduates who completed trade and industrial courses or receive credentials were prepared for the workforce?
4. To what extent did business professionals perceive that graduates who completed Robeson County Career Center trade and industrial courses were employable?

The methodology was a survey research design that utilized the Concentrator Feedback Survey (NCDPI, 2013a) that asked questions of a sample population who have attended, taught at or hired graduates from the Robeson County Career Center. The Concentrator Feedback Survey (NCDPI, 2013a) elicited responses using a Likert scale. Responses to choose from included numeric values that ranged from Strongly Agree (5), Agree (4), Neither Agree nor Disagree (3), Disagree (2), to Strongly Disagree (1). The questions in the Concentrator Feedback Survey (NCDPI, 2013a) were developed by NCDPI and were administered to high school graduates that took part in this study. The Concentrator Feedback Survey was adapted to address two additional sample groups, teachers in the program, and business professionals that employ graduates. The questions are similar in content, but specific for each sample group. Questions in the survey elicited the surveyed population's perception of the impact of career center courses on student employability and post-secondary education. Triangulation of the data from the different groups' perceptions, utilizing the same survey questions, permitted findings that provided valid results. The findings from this study were generated from the triangulation of data obtained from the different groups' perceptions. Findings were discussed and presented for interpretation of the study (Creswell, 2013).

Population and Sample

The Setting

The setting was Robeson County's Career Center that is located in rural North Carolina's largest county by land area with approximately 134,000 residents. In the 1970s, the mid-19th century building at Hilly Branch School was converted to a small

technology center for the purpose of providing career-technical courses in trade and industry. Those courses included masonry, electrical trade, welding, plumbing, and electronics. Each semester students from six of the county high schools take one first or second level, three-hour career-technical class that includes an interactive lab. The interactive lab operates with applications practiced and evaluated by qualified teachers with numerous years of industrial experience. State and/or national credentials are awarded at the successful completion of a second level course.

The students are bused each day from the following high schools: St. Paul's, Fairmont, Purnell Swett, South Robeson, Red Springs and Lumberton. High School enrollment ranges from 500 to 2,300 students. The Robeson County Career Center accepts approximately 300 students during any given semester; therefore, the Graduate Concentrator Feedback Surveys help to project the success rate of instruction in the trade and industrial courses.

Participants

At the time of this study, the Robeson County Career Center employed twelve teachers and enrolled approximately 300 students each semester. The second level courses or concentrator courses made up the advanced curriculum of each of the trade and industrial courses. The sample population data in this study included those who completed their second level course during the school year 2013-2014. Trade and industrial course graduates completed the Concentrator Feedback Surveys (NCDPI, 2013a) about ten months after graduation to determine their post-secondary activity at that time as mandated by the NCDPI. The director of the Robeson County Career Center agreed to share the Concentrator Feedback Survey (NCDPI, 2013a) data with

the researcher upon obtaining IRB approval. For this study, these survey data were secondary data analyzed to address the first two research questions. The researcher utilized an adapted Concentrator Feedback Survey to obtain perceptions from both teachers and business professionals.

This study gave insight into the perception of graduates, teachers and business professionals as they reviewed the impact of trade and industrial education in relation to the potential of graduates to enter the workforce or post-secondary education. Descriptive statistics were used to describe, organize, and interpret survey data (Creswell, 2013). The data included to what degree graduates perceived or valued the certification or trade and industrial coursework in preparation for post-secondary education or the workforce, to what degree did business professionals perceive trade and industrial education was an influence in the choosing of their employees, and to what degree did teachers think that the courses prepared graduates for post-secondary education or the workforce. The data triangulation consisted in analyzing data gathered from the three survey groups to validate the findings. Evidence from the different sources provided some insight about the Robeson County Career Center trade and industrial curriculum. The survey responses were used to summarize, interpret, and understand the characteristics of various perceptions (Creswell, 2013).

As the demand for skilled labor has grown, so has the need for career-technical classrooms and labs where students apply what they have learned (Perdue, 2013). Offering courses to over 600 students each year in industrial trades, the Robeson County Career Center provides certification with the completion of second level courses as skilled tradesmen (Perdue, 2013). The Career Center has expanded due to the

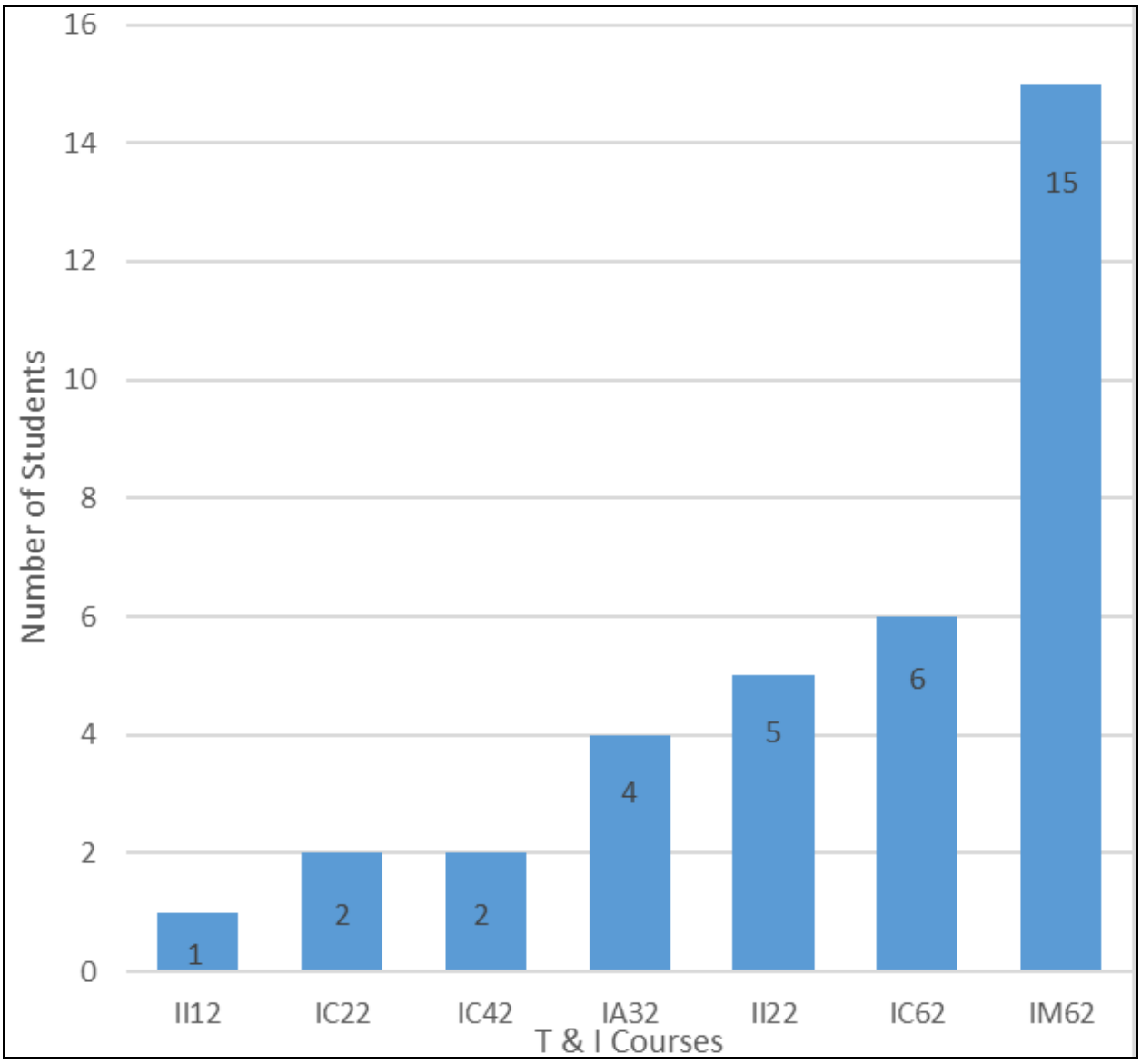
popularity and variety of courses required to comply with current demands of the labor market. One reason the industrial classes have become so popular is due to the students' anticipated entry into the labor market as skilled, credentialed tradesmen with the prerequisite of acquiring state or national certification. With credentialed qualifications, these graduates can immediately apply for jobs as skilled laborers (Perdue, 2013). The application of competencies through the Career Center's hands-on instruction was assessed through the surveys.

The population pool consisted of concentrators of T&I second level courses who also graduated from high school during the school year 2013–14 (see Figure 1). Approximately 158 graduate surveys from NCDPI's Concentrator Feedback Surveys were reviewed.

Validation of the Instrument

Instrumentation

NCDPI mandated the Graduate Concentrator Feedback Survey be completed by graduates the first year following high school graduation. The survey elicits perceptions of the extent of influence that Career-Technical Education courses made upon these graduates' entry into the workforce or post-secondary education. The survey results were supposed to evaluate the effectiveness of the CTE curriculum. The survey is administered within ten months following graduation to substantiate each graduate's post-secondary education or employment status. The internal consistency or the degree to which the items measure the same underlying attribute were data based on graduate perception. An indication of average correlation among all of the items will convey higher values indicating greater reliability. The validity consisted of criterion validity or



(*Note.* Network Engineer Technology II, Carpentry II, Electrical Trades II, Advanced Digital Media, Computer Engineering Technology II, Architectural Drafting II, Welding Technology II)

Figure 1. 2013–14 T&I Concentrators.

the relationship between scale scores and measureable criterion (Pallant, 2010). The contact of each graduate to collect the data provides the accumulation of reliable and valid data (see Appendix B).

The Concentrator Feedback Survey for the Career Center teachers was adapted from the Graduate Concentrator Feedback Survey that was utilized by NCDPI. The survey questions were similar, if not the same, as the original survey and the minor edits were examined by a group of business professionals and teachers to determine construct validity. Business professionals and teachers validated the internal consistency or the degree to which the items measured the same underlying attribute. The professionals were Terry Jackson, Robeson Community College Basic Education Transition Coordinator; Angela Locklear, Robeson Community College Testing Coordinator; and Felicia Hunt, Career Development Coordinator. An indication of average correlation among all of the items conveyed higher values indicating greater reliability. The validity consisted of criterion validity or the relationship between scale scores and measureable criterion (Pallant, 2010). The Graduate Concentrator Feedback Survey, adapted for CTE teachers, was delivered to the Career Center faculty for completion by each teacher, signed and returned within a week to the researcher for calculation and interpretation of results.

The Graduate Concentrator Feedback Survey adapted for the Trade and Industrial Business professionals *e*xamined the potential of graduates to be hired or employed by companies following completion of career center second level courses. The survey questions were similar, if not the same, as the original survey and the minor edits were examined by a group of business professionals and educators to determine

construct validity. The surveys were distributed to business professionals who were members of a local trade and industrial committee, The Robeson Technical Workers (see Appendix D). The internal consistency or the degree to which the items measured the same underlying attribute were reliable data based on business professionals' perceptions and the graduates' successful entry into the labor force. An indication of average correlation among all of the items conveyed higher values indicating greater reliability. The validity consisted of criterion validity or the relationship between scale scores and measureable criterion (Pallant, 2010). The paper copies of the adapted Graduate Concentrator Feedback Survey were completed June 6th at the regularly scheduled Robeson Technical Workers Committee meeting. It was requested that the survey be completed and returned within a designated time to the researcher for calculation and interpretation. The Graduate Concentrator Feedback Survey was developed by the NCDPI to survey graduates that completed a concentrator, second level trade and industrial course. The teacher and business surveys were reworded to address the same concerns as the NCDPI survey, but designed for a different audience.

The Concentrator Feedback Survey was originally called the Graduate Concentrator Survey and was authored by the NCDPI consultants in the late 1900s; however, little historical information was available on the evolution of the survey. The survey was created as an evaluation tool to determine the effectiveness of curriculum instruction in preparing Career-Technical students for the world of work or post-secondary education. Approximately ten months following graduation, graduates were contacted and asked to complete the survey with information concerning their current

educational status and current employment. This information should be used to improve curriculum instruction and was available at the NCDPI (2013a).

Data Collection Procedures

Secondary data from the 2013–14 school year collected by the NCDPI was used for this study with permission from the Robeson County Career-Technical Director. This secondary data, the Graduate Concentrator Feedback Surveys, were collected by NCDPI using survey assessments by Robeson County Career Center graduates (NCDPI, 2013a).

All completers (n=158) of 2013-14 second level courses responded through the Graduate Concentrator Feedback Survey as mandated by NCDPI. All twelve of the Career Center teachers were asked to complete the Graduate Concentrator Feedback Survey adapted for teachers. Approximately eleven trade and industrial business professionals were asked to complete the adapted Graduate Concentrator Feedback Survey to express their perceptions of the nontraditional instruction on graduate employability and post-secondary education. It was informative to compare the perceptions of workforce readiness and employability from concentrators, Career Center teachers and business professionals' surveys.

Data Analysis

Data analysis in survey research involved the collection, analyzing, and connections of quantitative and qualitative information in one or more investigative studies (Creswell, 2013). The mixed methods consisted of quantitative and qualitative data retrieved from the Concentrator Feedback Survey (NCDPI, 2013a) that assessed the perceptions of the graduates' trade and industrial course experience in relation to

preparing the student for post-secondary education or to enter the workforce. These questions required the graduates to tell if they were attending a community college or university or if they were working. The students were asked if the Career-Technical courses taken in high school were helpful in securing employment or post-secondary education (see Appendix B). Questions created by the NCDPI required specific details as to the post-secondary activity of each student. Current status in the military, community college, university, or the workforce was requested. The graduates were asked to rate the influence of Career-Technical Education courses in relation to their ability to secure employment or if earning a credential helped them get a better paying job or helped in advanced studies. NCDPI mandated that all school districts survey 95% of former graduates. The data were retained from NCDPI and with permission from the Robeson County Career-Technical Director (NCDPI, 2013a).

The survey results were compared to find significant differences or similarities among graduates in their perception of how trade and industrial courses impacted their post-secondary education or entrance into the workforce. Information elicited from the survey included the number of participants, the number of males or females in the sample, the range and mean of ages, educational level, and other relevant background information. Statistical analyses used descriptive statistics that included the mean, standard deviation, and range of scores, skewness, and kurtosis (Pallant, 2010).

The teachers' surveys conveyed the perception of the teachers' expectations of the graduates' readiness to enter the workforce or for post-secondary education. The questions asked the teachers whether they were of the opinion that trade and industrial courses prepared the graduates for post-secondary education or increased their

employability. Teachers were asked if the hands-on learning used by the Career Center teachers increased the graduates' workforce readiness level and if work-based learning activity or application aided the graduates' comprehension (see Appendix C). The teacher survey was used to gather the Career Center teachers' value of trade and industrial courses concerning former graduates entering the workforce and securing employment. The twelve teachers who presently teach at the Robeson Career Center were contacted by letter prior to the distribution of the survey. Included in the survey packets was a cover letter and participation letter. Paper copies of the surveys were delivered to the Career Center teachers and placed in their boxes. They were asked to return the completed survey within a designated time, sealed in an envelope to be picked up by the researcher. The survey took approximately fifteen minutes to complete.

Approximately eleven business professionals in the surrounding areas answered survey questions about their perception of trade and industrial course work on the employability of the graduate. They were asked if the training at the Career Center facilitated employability and if businesses valued certification or student credentials when reviewing applications for employment (see Appendix D). Business professionals consisted of representatives of business and industries in the surrounding communities that employed skilled trade and industrial workers. Certification of the graduates along with professional qualities of soft skills, knowledge, and work experience were examined through the survey data. The survey measured the perception of the employers on the hiring of the Career Center graduates to determine if the skills taught at the Career Center were beneficial to the workers' ability to perform duties and meet

the employers' expectations. The surveys were hard copies and were delivered by the researcher at the next scheduled Robeson Technical Workers committee meeting. It was requested that the surveys be completed by the end of the meeting.

The questions were developed around three basic concerns. Does the Career Center prepare the graduates for employment in the workforce; does the hands-on learning that takes place give the student the experience to become a better employee, and does it benefit the company to hire graduates with credentials?

The qualitative data collection included the perception of the person, whether student, teacher, or business professionals. Some open-ended questions may have less structure by changing, adding, or refining the techniques when gathering the information (University of Wisconsin-Eau Claire, 2013). The surveys examined the issues of interest and explored nuances that relate to the investigation (Mora, 2010). The quantitative data were conclusive as it establishes merit and understanding of projected results. This data will have measurable findings to examine and qualify the results (Roberts, 2012).

Processes

Processes were approved by East Carolina University's Institutional Review Board (IRB) and included informed consent by participants as well as the confidentiality and identity protection of those participating in the study. The process was precise with ethical steps taken to ensure an accurate research study. Letters of permission to conduct the analysis, letters of invitation to participate, and consent forms were obtained. A consent form was distributed to participants, explaining the purpose of the study and promising the confidentially of identity and participation. The consent

preceded any contact with regards to the gathering of information for research. For optimum comfort and reassurance, the volunteer participant chose the time and place for the consent process.

Graduate Concentrator Feedback Survey data were utilized with permission from the Robeson County Career-Technical Director pertaining to information provided by the 2013-2014 graduates of Robeson County Career Center. Teacher and business professional surveys were also collected to determine the impact of instruction on student employability and post-secondary education. The data from the three survey groups were triangulated to document participants' perceptions of the effectiveness of trade and industrial courses taught at Robeson County Career Center.

Statistical Analyses

According to Creswell (2013), "researchers engage in interpreting the data when they conduct qualitative research. Interpretation involves making sense of the data, the lessons learned. Interpretation in qualitative research involves abstracting out beyond the codes and themes to the larger meaning of the data" (p.187).

The researcher read the responses of the open-ended questions and determined themes or patterns of responses. Themes were labeled with a title that was representative of similar responses. Answers to the open-ended questions were reflective of the participants' experiences and viewpoints relative to the topic. The open-ended responses may provide the researcher with ample information for in-depth analysis (Creswell, 2013).

In Table 1, survey and research questions are compared to analyze the data from the three sample groups. The survey questions were aligned with each research

Table 1

Survey & Research Questions

Question on Survey	Relation to Research Question	Graduate Perceptions Mean Score	Career Center Teacher Perceptions Mean Score	Business/ Employer Perceptions Mean Score
Question 4: How strongly do you agree with the following statement? Earning a Credential helped me in my further studies or advance training.	Question 2: To what extent do graduates perceive that T&I courses added to their postsecondary educational potential?	4.2	3.1	1.0
Question 5: How strongly do you agree with the following statement? Career-Technical education was One Important reason I stayed in school.	Question 1: To what extend do graduates perceive that the Trade and Industrial courses taken at the Robeson County Career Center contributed to their employment potential?			

Table 1 (continued)

Question on Survey	Relation to Research Question	Graduate Perceptions Mean Score	Career Center Teacher Perceptions Mean Score	Business/ Employer Perceptions Mean Score
Question 6: How strongly do you agree with the following statement? Earning a credential helped me gain a job, internship or work experience.	Question 3: To what extend do Career & Technical Educators at the Robeson County Career Center perceive that graduates who complete T&I courses or receive credentials are prepared for the workforce?	4.2	3.1	1.0
Question 7: How strongly do you agree with the statement? Earning a credential helped me earn a better paying job?	Question 4: To what extent do business professionals perceive that graduates who complete Robeson County Career Center trade and industrial courses are employable?			
Question 8: How strongly do you agree with the following statement? Earning a credential help me in my further studies or advanced training?	Question 2: To what extent do graduates perceive that T&I courses added to their postsecondary educational potential?	4.2	3.1	1.0

Note. The mean (average scores) for each question in the questionnaires will be used to compare the similarities and differences for Graduates, Career Teachers, and Business. The three means will be compared to examine the perceptions.

questions that could be answered with data from that particular question. The mean (average scores) for each question in the questionnaires were used to compare the similarities and differences for Graduates, Career Teachers, and Business. The three means were compared to examine the perceptions.

Summary

The research may reveal whether the nontraditional career center instruction provided graduates the skills and certifications that place them at greater advantage for employment opportunities or post-secondary education. Analyzing perceptions from graduates, teachers, and employers may strengthen the program by identifying areas of needed improvement and the impact these future improvements may have on the local economy. This study helped to better understand the benefits of trade and industrial education by examining the impact of the Career Center's nontraditional instruction, graduates' employability or post-secondary accomplishments, the Career Center teachers' perception of student learning, and industry's value of trade and industrial education. The triangulation of the data helped to focus on the necessity of 21st century skills to build a globally competitive workforce.

CHAPTER 4: FINDINGS AND ANALYSES

Introduction

In a seven-year period, 1996-2003, Robeson County, the largest and poorest county in North Carolina, lost nine thousand jobs (Cummings, 2016). This downward economic spiral suggests fewer employment opportunities for high school graduates, loss of tax dollars, and increased participation in government assistance programs. Therefore, examining the Robeson County Career Center's role in preparing students for employment and/or post-secondary education may help to improve the economic outlook of the county.

The purpose of this study was to assess high school graduates, educators, and business professionals' perceptions of the Robeson County Career Center's trade and industrial education in the preparation of students for employability and post-secondary education. This study explored the graduates' perceptions of the trade and industrial instruction, teachers' educational expectations, and business professionals' evaluation of the Career Center graduates' readiness for employment or post-secondary education. This mixed-method study involved survey data and open-ended responses from three sample groups. Both quantitative and qualitative data were collected from the three sources to triangulate perceptions. The sample groups consisted of trade and industrial teachers (n=12), area business professionals (n=11), and graduates (n=158) who completed the 2013-14 Graduate Concentrator Feedback Surveys as mandated by the NCDPI. Data from the three sample groups were used to compare perceptions of the Career Center graduates' readiness for employability and post-secondary education. Triangulation of the three data sets - graduates, teachers, and

business professionals - were compared, question by question, to determine the positive and negative perceptions of the three sample groups relevant to employment and post-secondary education.

Graduate Concentrator Feedback Surveys, developed by the NCDPI, are part of the evaluation tools used by the State of North Carolina to clarify and validate graduates' experience in Career-Technical Education (CTE) and the impact it has had in workforce preparation or further education. The feedback analyzed how well CTE met graduates' needs as mandated by the 2006 Perkins Law. The data assists educators in developing strategies to improve classroom performance (NCDPI, 2006). The Graduate Concentrator Feedback Surveys tracked the post-secondary education and employment status of CTE graduates.

Perceptions of CTE teachers and business professionals that hired trade and industrial graduates were also assessed to determine benefits of employing skilled or certified graduates. For this study, the Graduate Concentrator Feedback Survey, taken by graduates, was adapted to address these two additional sample groups. The questions were similar in content, but specifically addressed to each sample group. Data from the three sample groups were analyzed to answer the questions in the study. The study questions were:

1. To what extent did graduates perceive that the trade and industrial courses taken at the Robeson County Career Center contributed to their employment potential?

2. To what extent did graduates perceive that the trade and industrial courses taken at the Robeson County Career Center added to their post-secondary educational potential?
3. To what extent did Career-Technical educators at the Robeson County Career Center perceive that graduates who complete trade and industrial courses or receive credentials were prepared for the workforce?
4. To what extent did business professionals perceive that graduates who complete Robeson County Career Center trade and industrial courses were employable?

This chapter described the study's participants and their perspectives of the impact of trade and industrial education in relation to the potential of graduates to enter the workforce or post-secondary education.

Study Sample

The methodology was a mix-method research design that utilized the Graduate Concentrator Feedback Survey (NCDPI, 2013a) and asked questions of a sample population who attended, taught at, or hired graduates from the Robeson County Career Center.

The criteria for the selection of the participants included the following:

- Students (n=158) who were completers of a second level trade and industrial course in 2013-2014 school year. Out of the158 students required to complete the Graduate Concentrator Feedback Survey, 100% of credentialed students answered the questions of which they were eligible to answer. Graduates who had appropriate credentials were asked to answer all the

questions. Questions 6-8 did not apply to all graduates; therefore, 100% of those eligible and credentialed answered the required questions.

- Teachers (n=12) who taught trade and industrial courses at the Robeson County Career Center. One-hundred percent (n=12) of the teachers responded.
- Business professionals (n=11) of the Robeson Technical Workers Committee from the surrounding area. One-hundred percent (n=11) of the business professionals responded.

Data Collection

Data from the 2013-14 Graduate Concentrator Feedback Surveys were provided by NCDPI in the spring semester of 2016. Questions 1-3 pertained to the graduates' military and post-secondary status. Questions 4-10 required responses on a Likert scale with numeric values that ranged from Strongly Agree (5), Agree (4), Neither Agree nor Disagree (3), Disagree (2), to Strongly Disagree (1). Information elicited from questions 4-10 fell into three categories: the effect that CTE had on the decision to stay in school, the effect earning a credential had on employability, and the effect CTE had on post-secondary education. Responses from all graduates (n=158) who completed the Graduate Concentrator Feedback Surveys were compiled and stored at NCDPI.

Graduate Concentrator Feedback Surveys, adapted for teachers, used the same Likert scale response options given to students with numeric responses that ranged from Strongly Agree (5), Agree (4), Neither Agree nor Disagree (3), Disagree (2), to Strongly Disagree (1). The open-ended questions were developed by a Validation Committee, created to insure research accountability. Questions 1 and 2 elicited

information about the courses taught by each teacher and the years of experience in trade and industry. Questions 3–9 used responses from a Likert scale with numeric values that ranged from Strongly Agree (5), Agree (4), Neither Agree nor Disagree (3), Disagree (2), to Strongly Disagree (1). The questions fell into three categories: the effect of workforce experience on teaching CTE courses, the effect of CTE on keeping students in school, and the effect of CTE on student employability and post-secondary education. Question 10 was open-ended and asked for a comment on nontraditional hands-on instruction versus traditional classroom instruction. The surveys for the Robeson County Career Center teachers (n=12) were hand delivered during a meeting on June 6, 2016, completed, and returned to the researcher at the end of the meeting. One-Hundred percent of the Career Center teachers (n=12) completed the surveys and answered the open-ended question.

On June 7, 2016, business professionals' surveys, using Likert scale responses with numeric values that included Strongly Agree (5), Agree (4), Neither Agree nor Disagree (3), Disagree (2), and Strongly Disagree (1) and an open-ended question were hand-delivered to the Career-Technical District County Office for distribution at the Robeson Technical Workers Committee meeting that day. Questions 1-3 identified the business type and company-training programs, questions 4-9, using Likert scale responses with numeric values that ranged from Strongly Agree (5), Agree (4), Neither Agree nor Disagree (3), Disagree (2), to Strongly Disagree (1). The questions were similar in content to Graduate Concentrator Feedback Survey, but adapted for business professionals. The open-ended question asked business professionals to explain, in their opinion, if trade and industrial courses better prepared students to apply critical

thinking and problem solving skills. The researcher collected responses from the Career-Technical District office on June 14, 2016. One-hundred percent of the business professionals (n=11) returned the surveys.

Responses from all Public Schools of Robeson County Graduates (n= 158) who completed the Graduate Concentrator Feedback Survey were recorded. One hundred percent of the Robeson County Career Center teachers (n=12) completed the surveys and answered the open-ended question.

Data Analyses

The mixed-method research design was based on qualitative and quantitative data collected from three sources: 2013-14 Graduate Concentrator Surveys, trade and industrial teachers' surveys, and business professionals' surveys. The data were analyzed to determine to what extent, if any, hands-on instruction, the basis of trade and industrial education at the Robeson County Career Center, affected the potential of graduates to enter the workforce or post-secondary education.

Graduates

All student participants were graduates who completed second level trade and industrial courses. Graduates completed the Graduate Concentrator Feedback Survey as mandated by the NCDPI within a year following graduation. The data analyzed were from 2013-14 graduates. Out of the 158 graduates, 79% (125 of 158) were male and 21% (33 of 158) were female (see Figure 2). The class most taken was Masonry, 26% (41 of 158) (see Figure 3). Graduates reported the completion of courses from 18 available options. The average enrollment was 8.7 students per class.

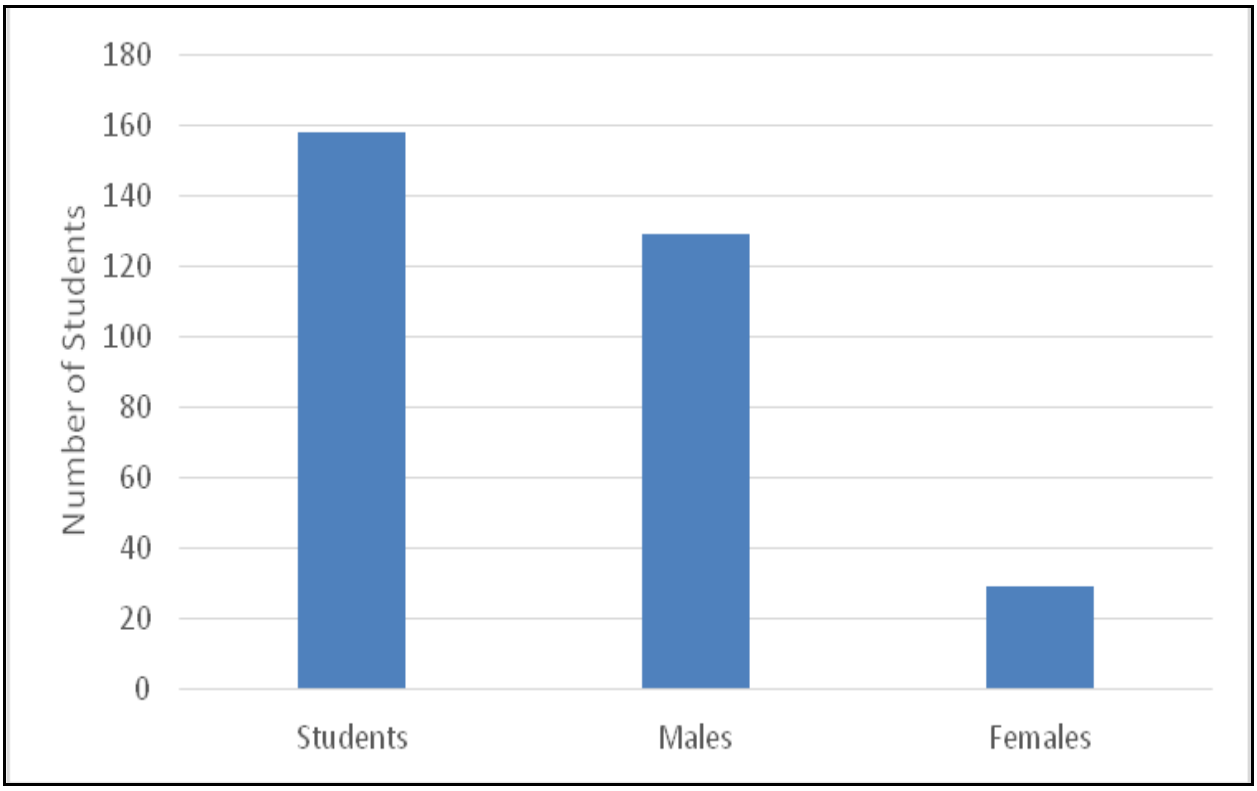


Figure 2. Trade & industrial graduates by gender.

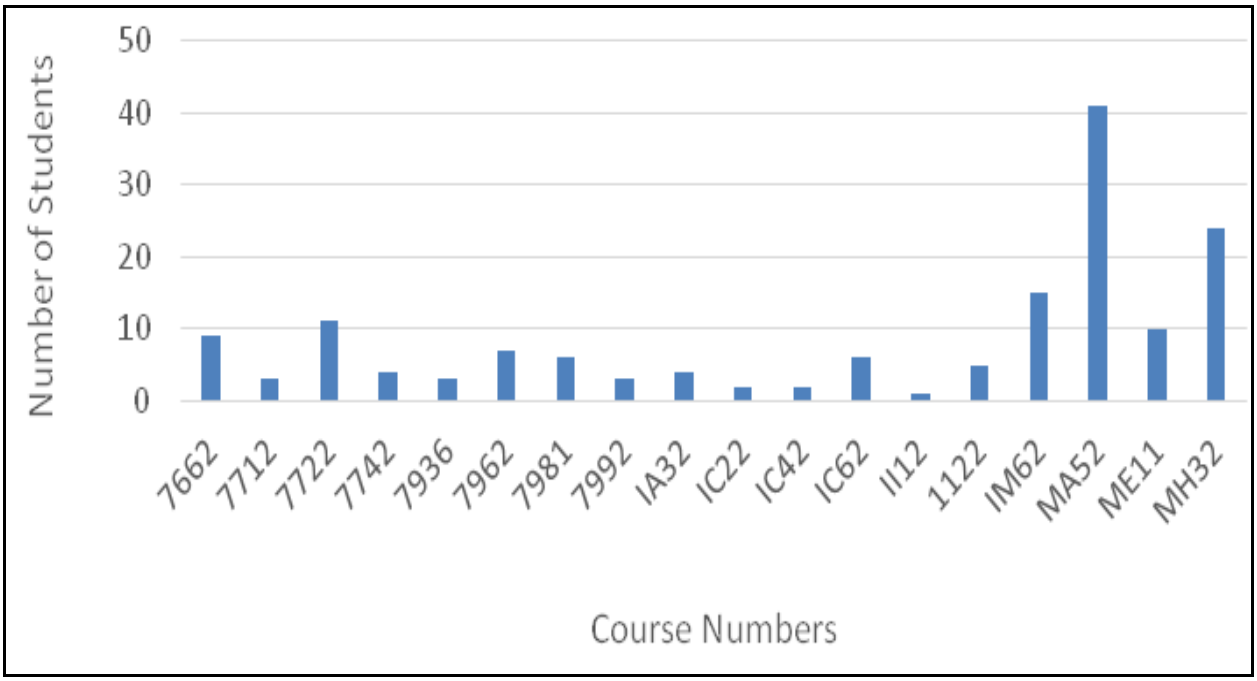


Figure 3. Trade & industrial course enrollment.

Questions 1-5 averaged a response rate over 50% (see Figure 4). These questions asked graduates about current education and employment status. The response rate for questions 6-7 was 2%. These questions asked graduates about the effect of earning a credential. The response rate for question 8 was 9%. This question asked graduates about post-secondary credit. The response rate for question 9-10 was less than 1%. These questions asked graduates about the effect of belonging to a Career-Technical Student Organization.

Teachers

Robeson County Career Center trade and industrial teachers had a combined total of 315 years of experience (see Figure 5). The average years of experience of the all male trade and industrial faculty was 24 years. The most experience was in computer engineering with 40 years completed. The Metal Manufacturing teacher had 39 years of experience. The next two most experienced teachers were Carpentry and Masonry who each had 35 years of experience. Visual design was the area of least teaching experience.

Business Professionals

The business professional participants (n=11) worked in Robeson County or the surrounding areas and possessed in-depth knowledge of the demographics and employment demands of the county. The majority of the respondents were members of the Robeson Technical Workers Committee.

Four business participants were from the manufacturing sector, two were from customer service and industry, and the remaining three, Agriculture, Educational Research, and Public Safety were represented by one from each (see Figure 6).

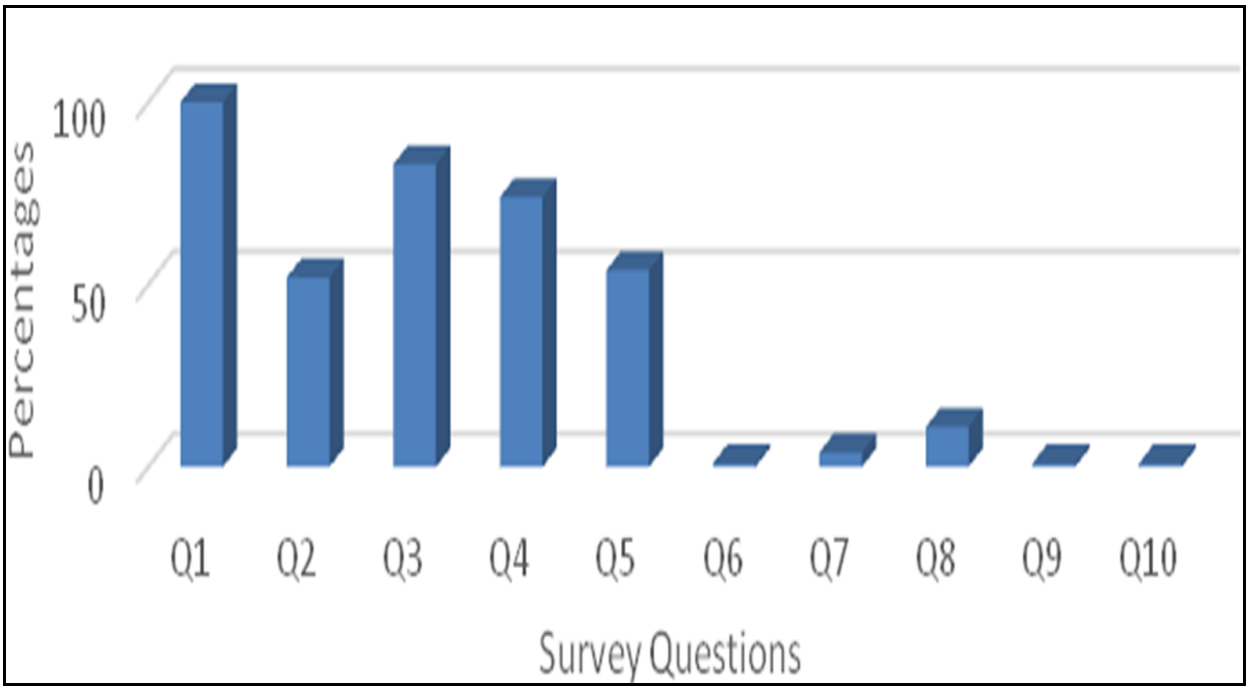


Figure 4. Graduate Concentrator Survey response rate.

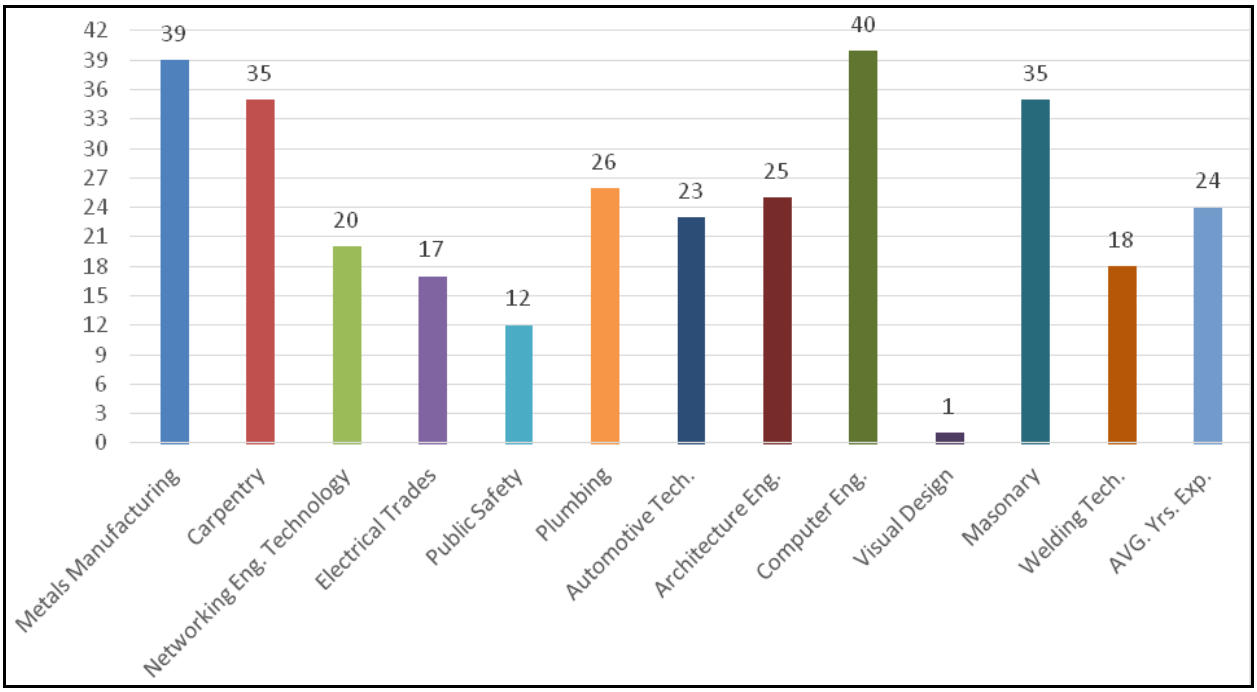


Figure 5. Years of employment.

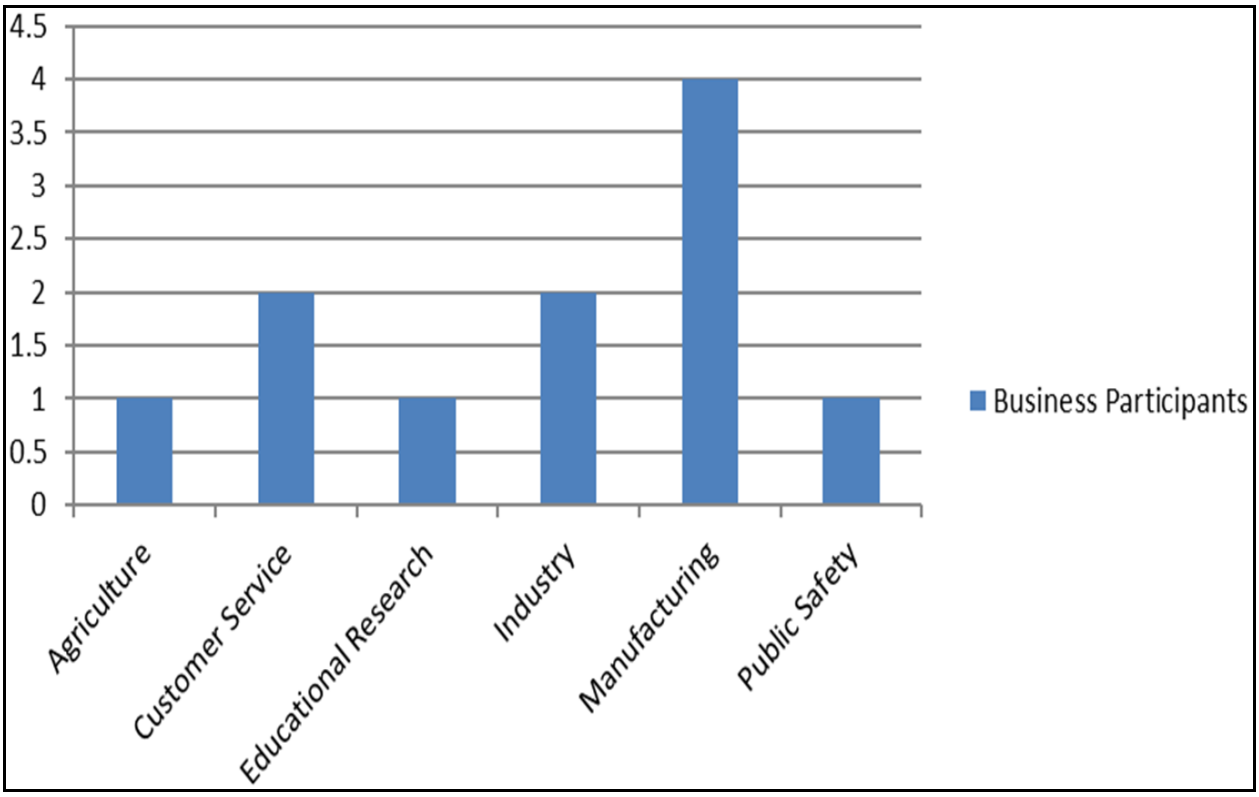


Figure 6. Business participants.

Quantitative Data Analyses

Graduate Concentrator Feedback Survey

Within 10 months following a student's graduation, each student who earned credit for a second level trade and industrial Career-Technical course, completed the Graduate Concentrator Feedback Survey, developed and mandated by the NCDPI. The following data analysis was from the Robeson County high school graduates (n=158) who completed the 2013-14 Graduate Concentrator Feedback Survey.

Summary of 2013-2014 Graduate Responses

In questions 1, 2, 3, and 9, the graduate surveys elicited personal data responses. In questions 4, 5, 6, 7, 8, and 10, graduates chose from the following Likert scale responses with numeric values that ranged from Strongly Agree (5), Agree (4), Neither Agree nor Disagree (3), Disagree (2), to Strongly Disagree (1). The first survey question asked graduates, "Are you a member of the military?" One hundred fifty-six graduates responded "No" and two answered "Yes" (see Figure 7).

The second question asked students, "What is your current post-secondary education/advanced training status?" Data indicated 28% (45 of 158) of students attended a university, 23% (37 of 158) reported to be attending a community college, and 1% (1 of 158) self-reported attending a different post-secondary institution (see Figure 8).

The third question asked graduates, "What is your current employment status?" The data indicated 16% (26 of 158) were unemployed and looking for full time employment, 39% (61 of 158) reported to be looking for part-time employment, 18% (29

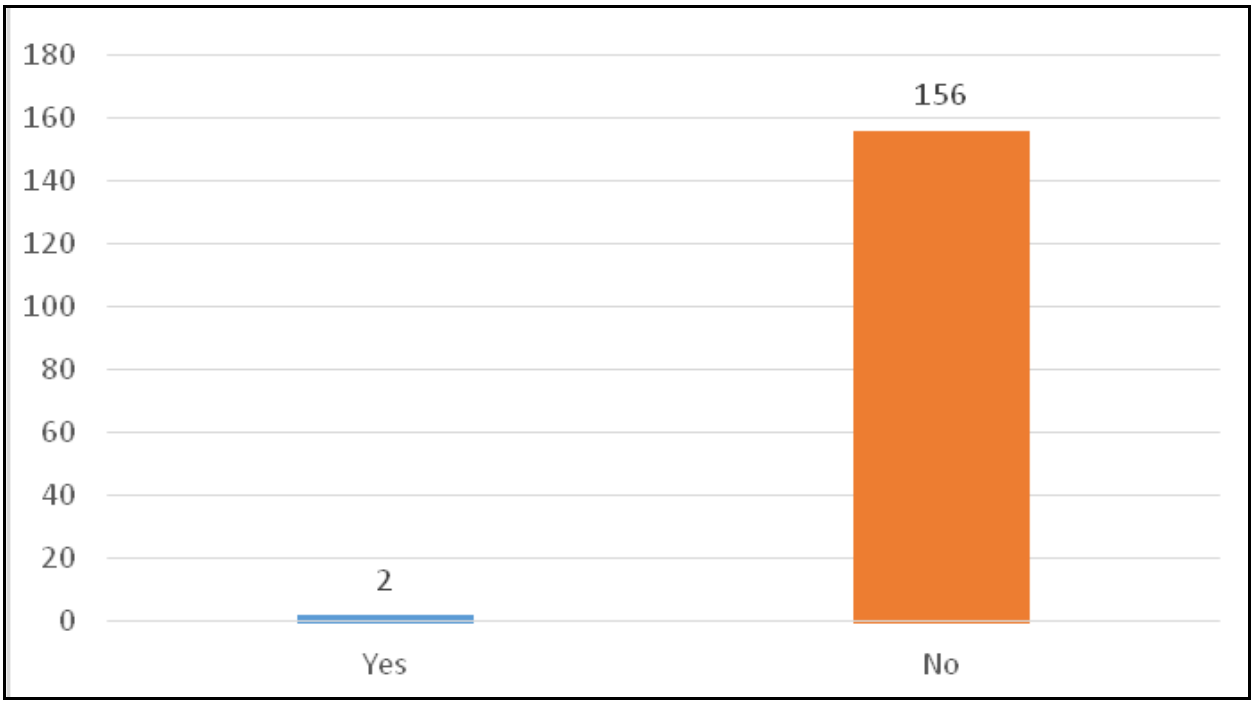


Figure 7. Q1 graduates.

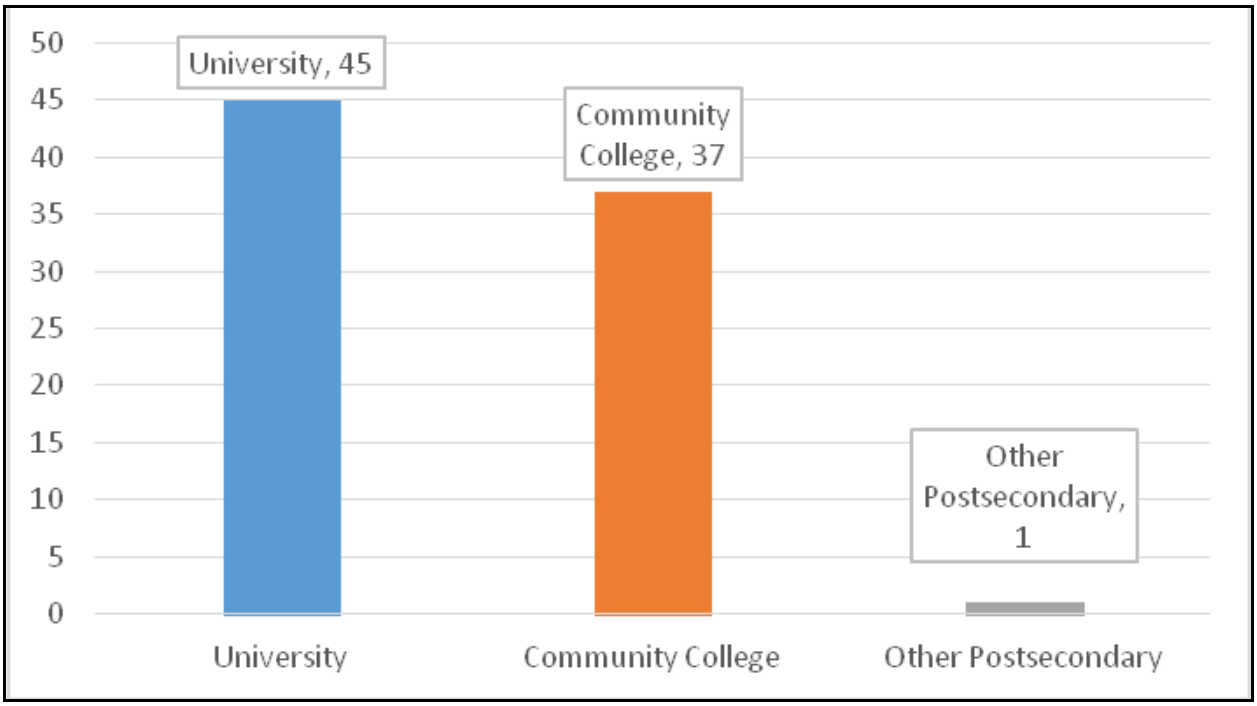


Figure 8. Q2 graduates.

of 158) reported full time employment, and 16% (25 of 158) reported part-time employment (see Figure 9).

The fourth question asked graduates, “How strongly do you agree with the following statement” Career and Technical Education was one important reason I stayed in school.” Data indicated 9% (14 of 158) students responded “Yes” and 65% (103 of 158) answered “No” (see Figure 10).

The fifth question asked graduates, “How strongly do you agree with the following statement? Earning a credential helped me gain a job, internship or work experience.” Data indicated 5% (8 of 158) graduates responded “Yes” and 49% (78 of 158) answered “No” (see Figure 11).

The sixth question asked graduates, “How strongly do you agree with the following statement? Earning a credential helped me earn a better paying job.” Only 1% (2 of 158) graduates responded “No.” The majority of graduates 99% (156 of 158) did not respond to question six (see Figure 12). Only graduates who had earned a credential were eligible to respond.

The seventh question asked graduates “How strongly do you agree with the following statement? Earning a credential helped me in my further studies or advanced training.” One of 158 graduates (0.6%) responded “Yes” and 4% (6 of 158) responded “No.” No responses were recorded from 151 graduates (see Figure 13).

The eighth question asked graduates, “How strongly do you agree with the following statement? Ability to earn post-secondary credit helped make decisions about my educational path.” One percent (1 of 158) graduates responded “Yes” and 10% (16 of 158) responded “No.” No response was recorded for 141 students (see Figure 14).

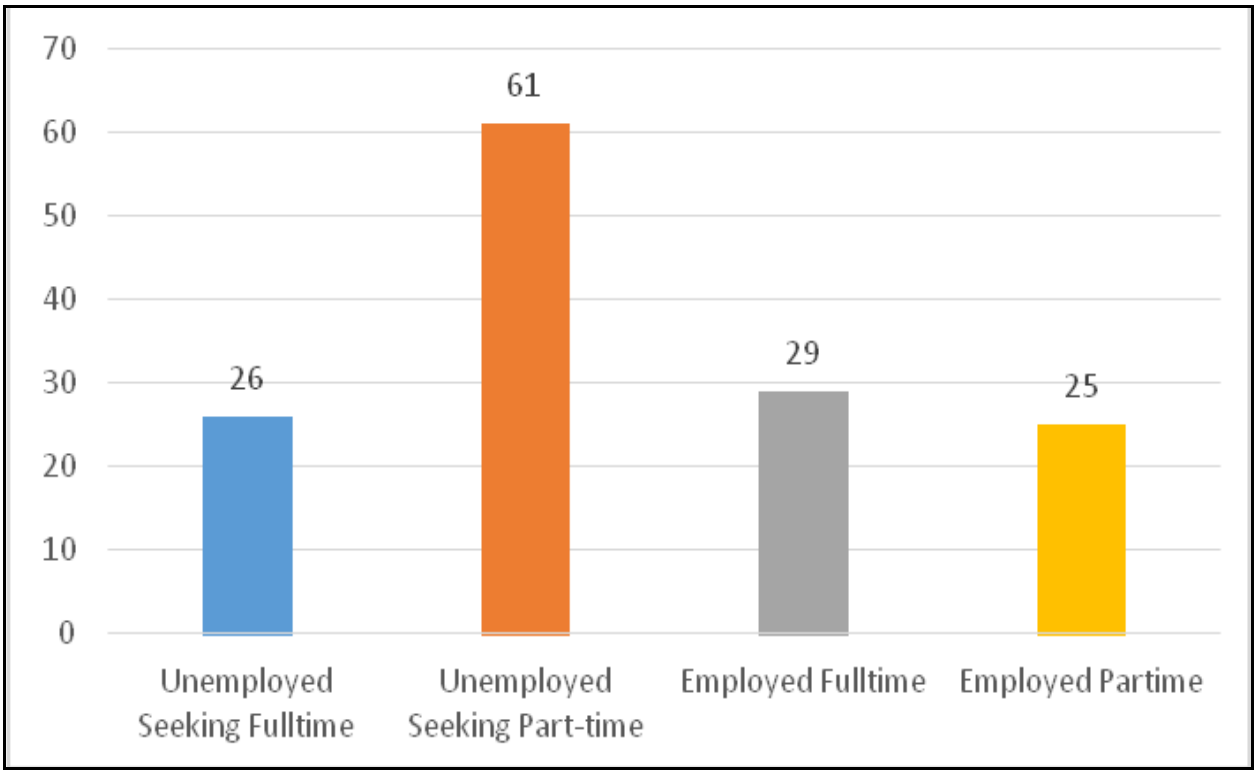


Figure 9. Q3 graduates.

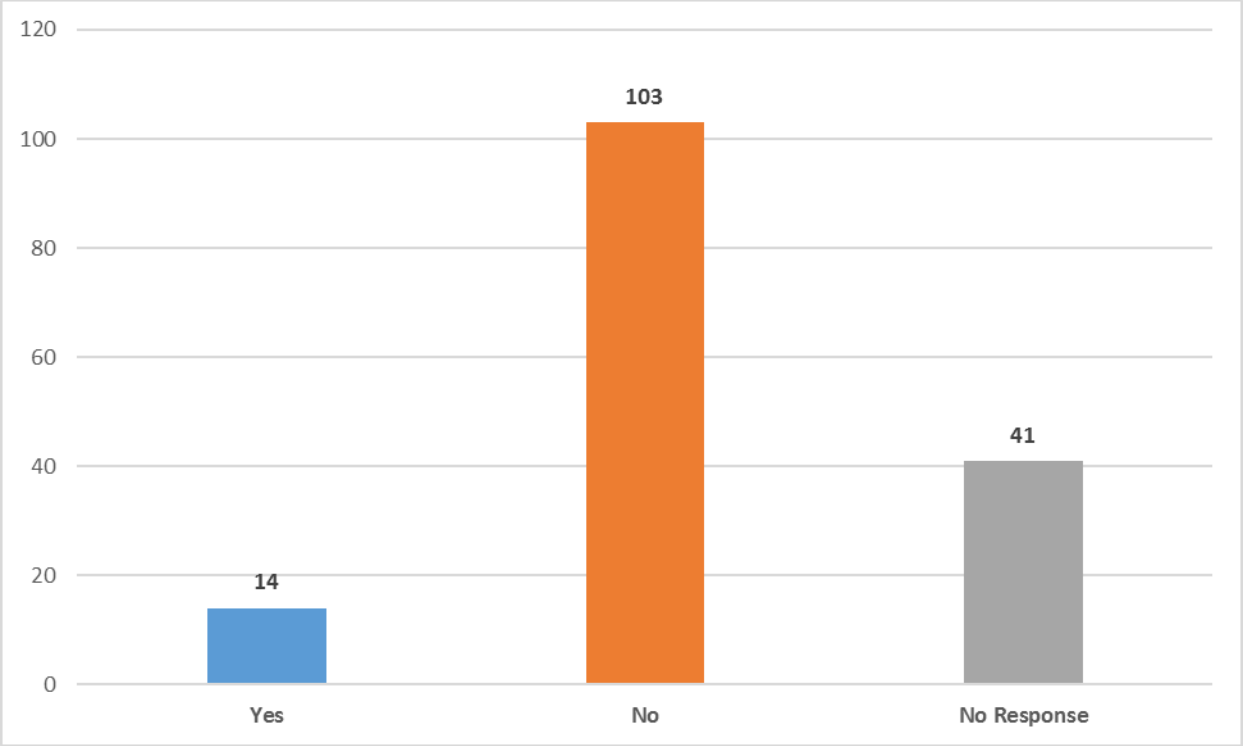


Figure 10. Q4 graduates.

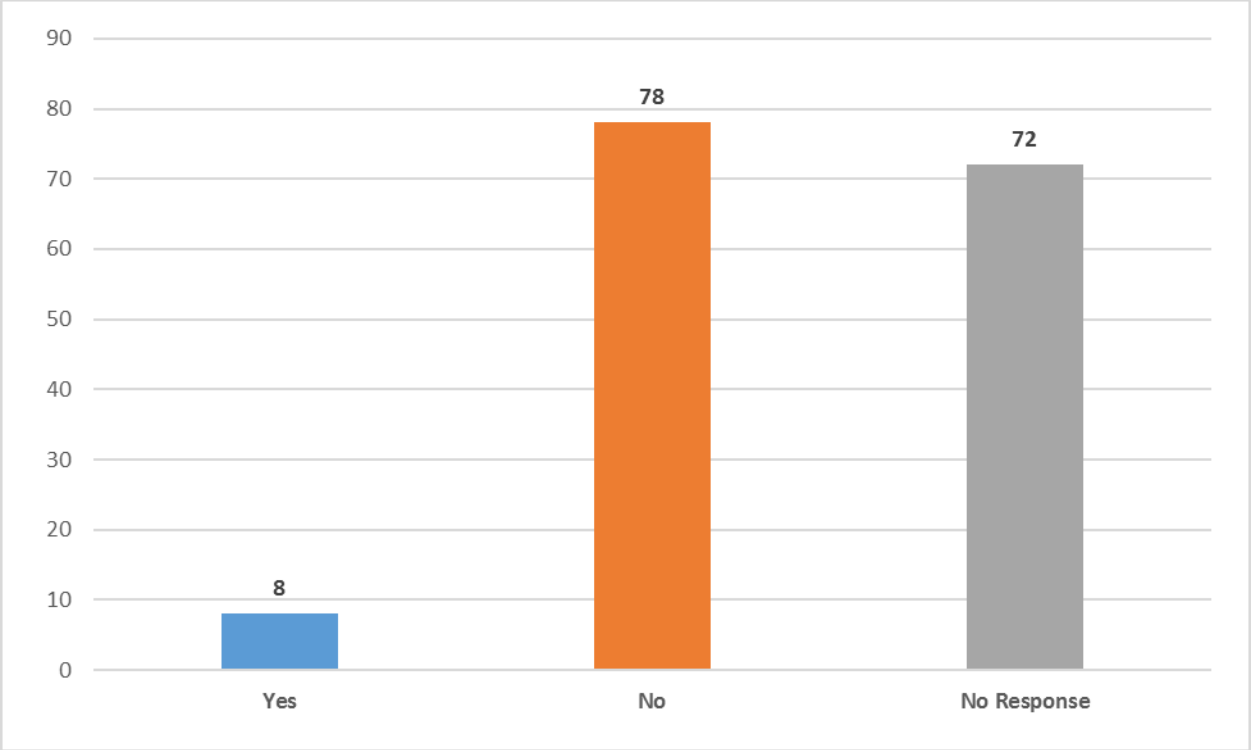


Figure 11. Q5 graduates.

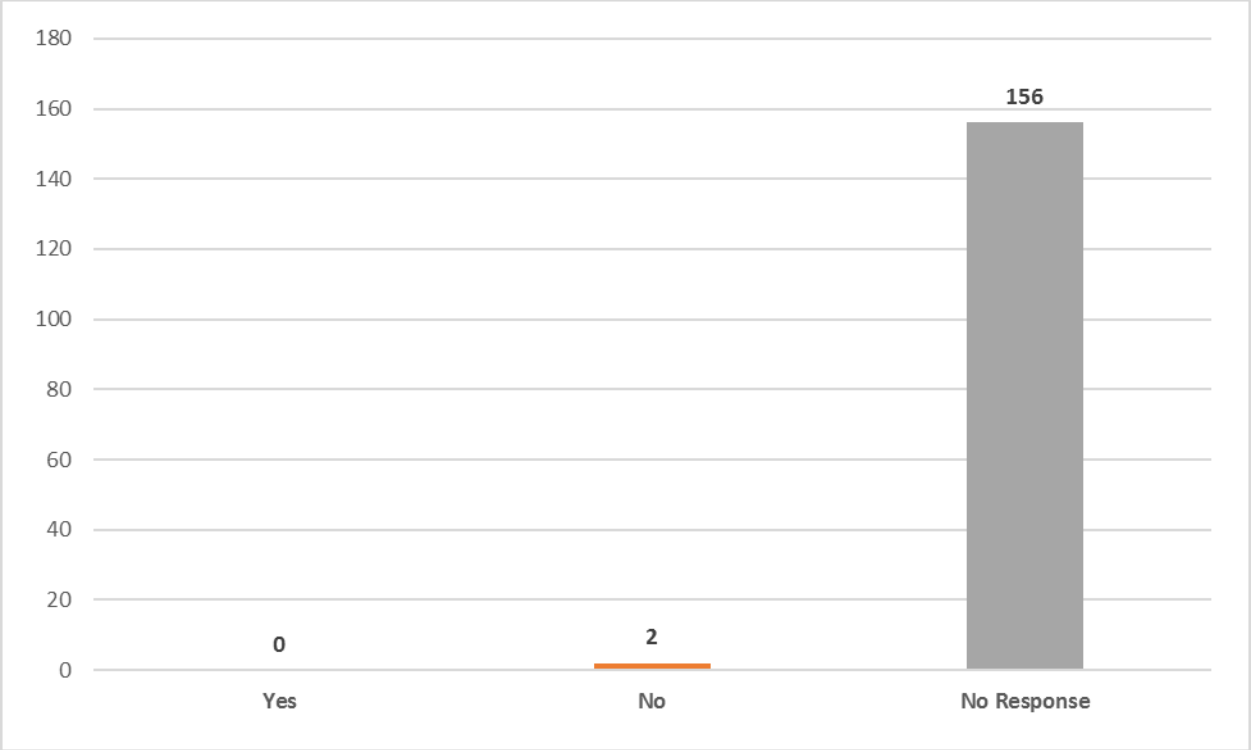


Figure 12. Q6 graduates.

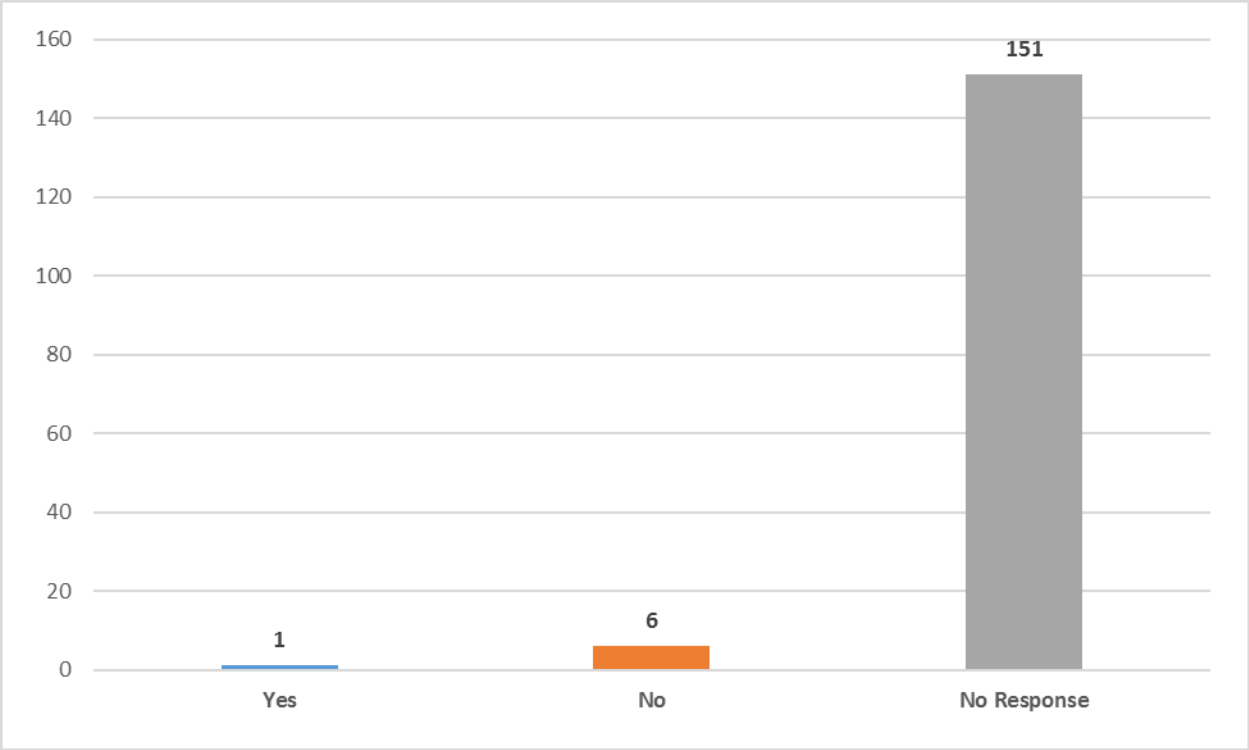


Figure 13. Q7 graduates.

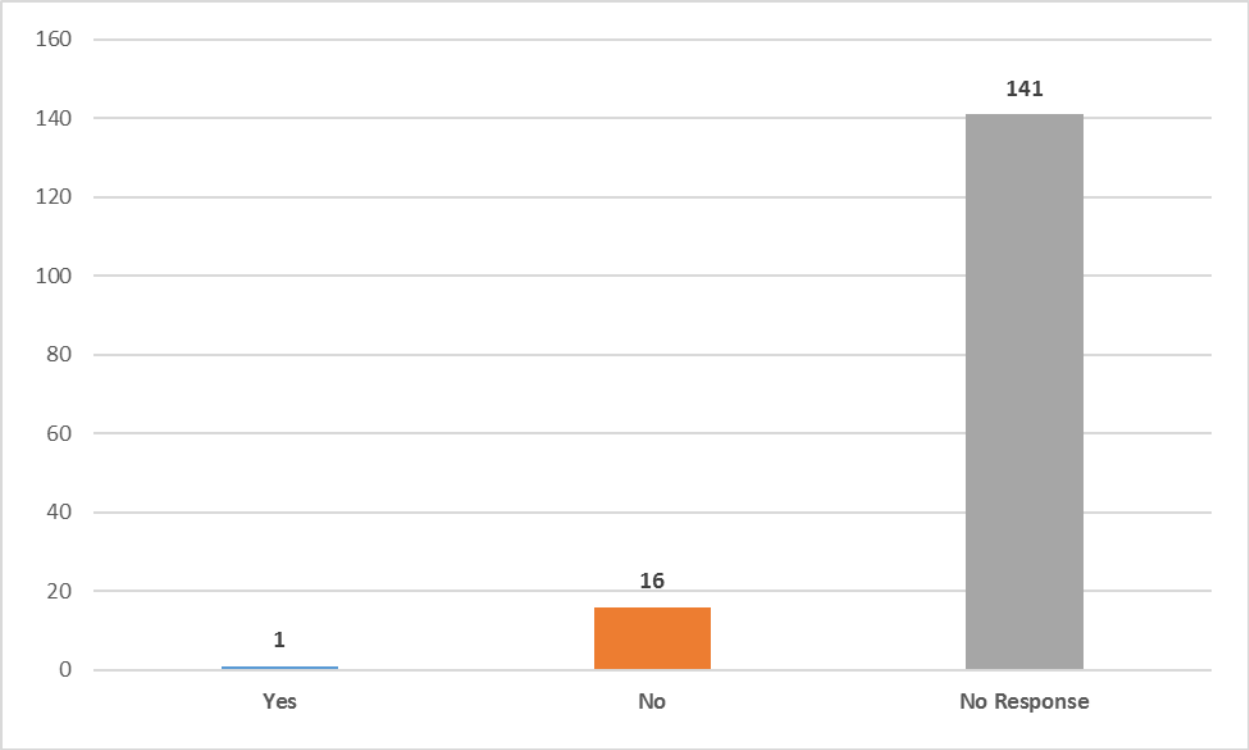


Figure 14. Q8 graduates.

The ninth question asked graduates, “Did you belong to a Career and Technical Education Student Organization in high school?” Two graduates 1% (2 of 158) responded “No.” No response was noted for 156 graduates (see Figure 15).

The tenth question asked graduates, “How strongly do you agree with the following statement? Belonging to a Career-Technical Student Organization (CTSO) in high school helped prepare me for further education or employment.” Twenty percent (32 of 158) of graduates answered “Yes” and 69% (109 of 158) responded “No” (see Figure 16).

The ten survey questions were answered by most of the graduates; however, questions 6, 7, and 8, targeted graduates who were eligible to earn a credential. Therefore, a majority of the graduates could not answer the questions unless they were eligible to earn a credential or had earned a credential when completing the second level trade and industrial course. The collected data indicated questions 6, 7, and 8, those dealing with credentials, were only answered by credentialed graduates. The offering of industry certifications was made available through the trade and industrial courses starting in 2011.

Trade and Industrial Teacher Survey

All of the Robeson County trade and industrial teachers (n=12) completed the Graduate Concentrator Feedback Survey adapted for teachers (see Figure 17). The teacher surveys were similar to the graduates and elicited with in a Likert scale with numeric values that ranged from Strongly Agree (5), Agree (4), Neither Agree nor Disagree (3), Disagree (2), to Strongly Disagree (1).

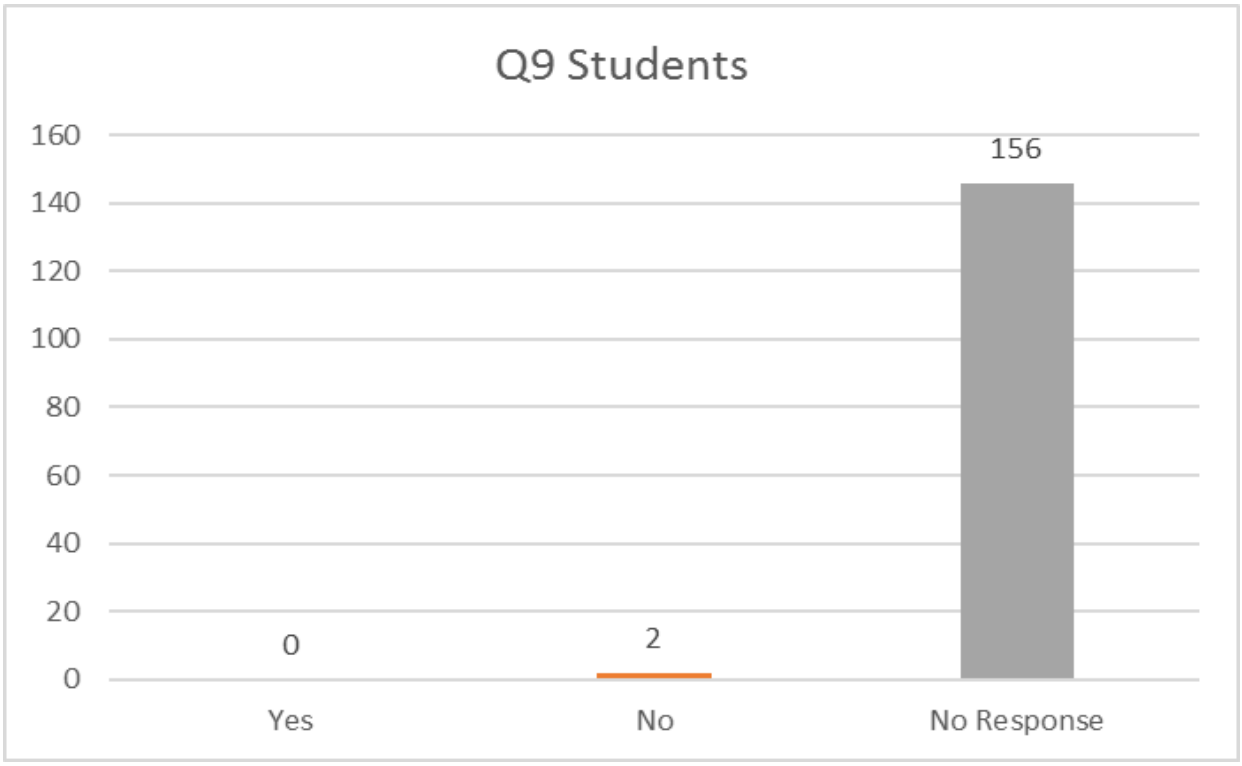


Figure 15. Q9 graduates.

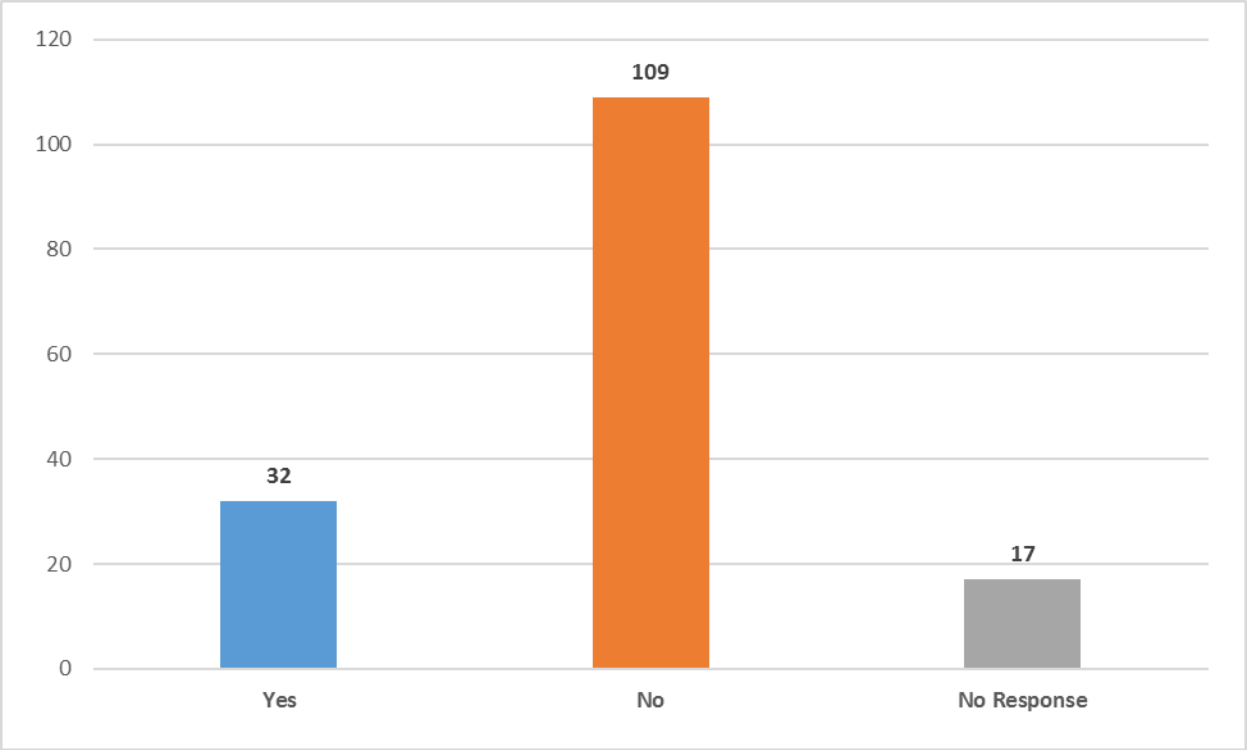


Figure 16. Q10 graduates.

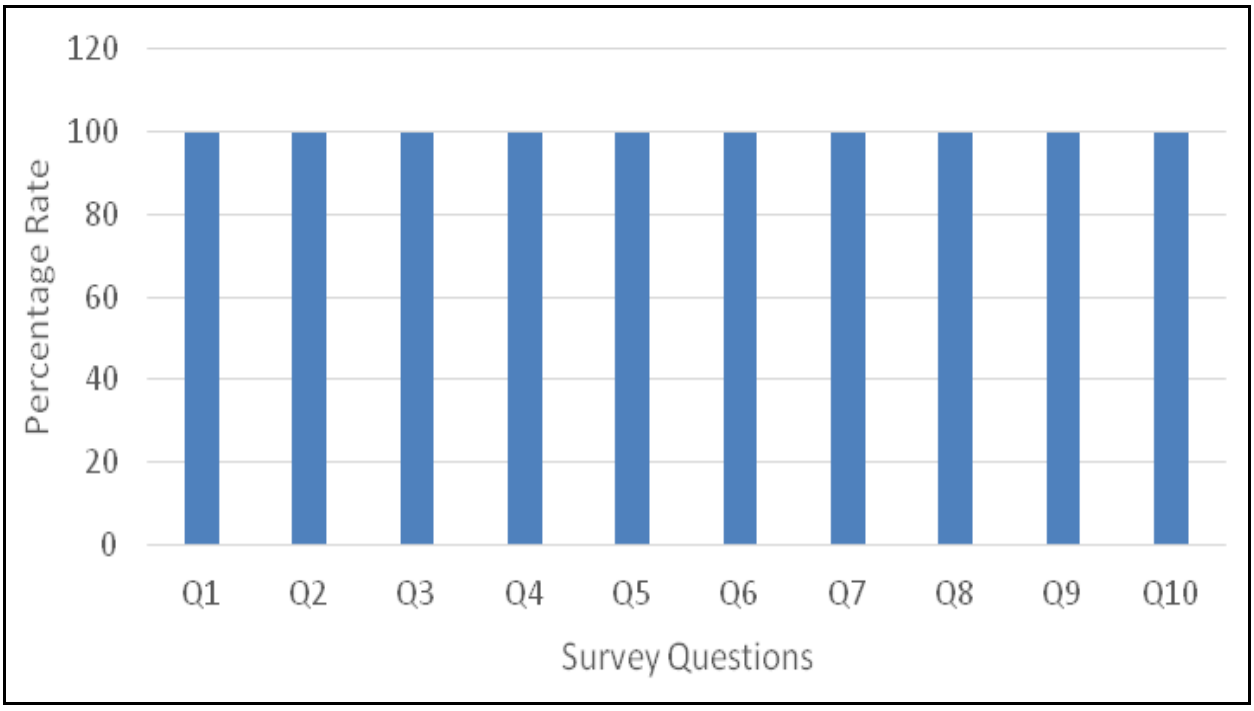


Figure 17. Teachers' response rate.

The first question asked for area of instruction and the second question asked for years of industrial experience. The third question elicited teachers' responses to "As a teacher of CTE how strongly do you agree with the statement that experience in the workforce better qualifies an instructor to teach trade and industrial course?" Data indicated that 75% (9 of 12) teachers Strongly Agreed, and 25% (3 of 12) Agreed (see Figure 18). One-hundred percent of the teachers (n=12) agreed that workforce experience better qualifies an instructor to teach trade and industrial courses.

The fourth question asked, "How strongly do you agree with the following statement? CTE Education allows graduates to be more connected with their career goals thus keeping them in school." Data indicated 92% (11 of 12) Strongly Agree and 8% (1 of 12) Agree. All teachers (n=12) agreed that CTE was a factor in keeping graduates in school (see Figure 19).

The fifth question asked, "How strongly do you agree with the following statement? Earning a credential helps graduates obtain an internship, work experience, or gain a job." Data indicated 58% (7 of 12) teachers Strongly Agreed, 17% (2 of 12) Agreed and 25% (3 of 12) Neither Agreed nor Disagreed. The majority of teachers, 75% (9 of 12) agreed a credential is helpful in gaining employment or obtaining an internship (see Figure 20).

The sixth question asked, "How strongly do you agree with the following statement? Earning a credential helps graduates earn a better paying job." Data indicated 42% (5 of 12) teachers Strongly Agreed, 33% (4 of 12) Agreed, 17% (2 of 12)

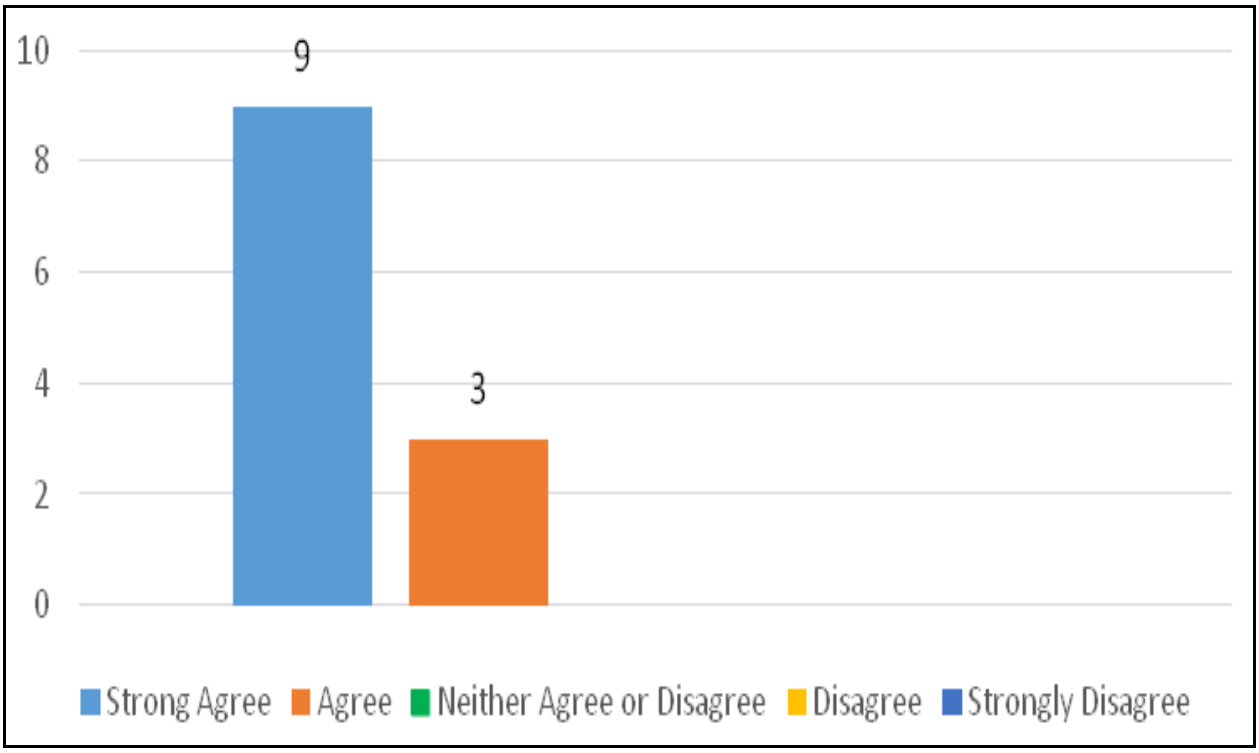


Figure 18. Q3 teachers.

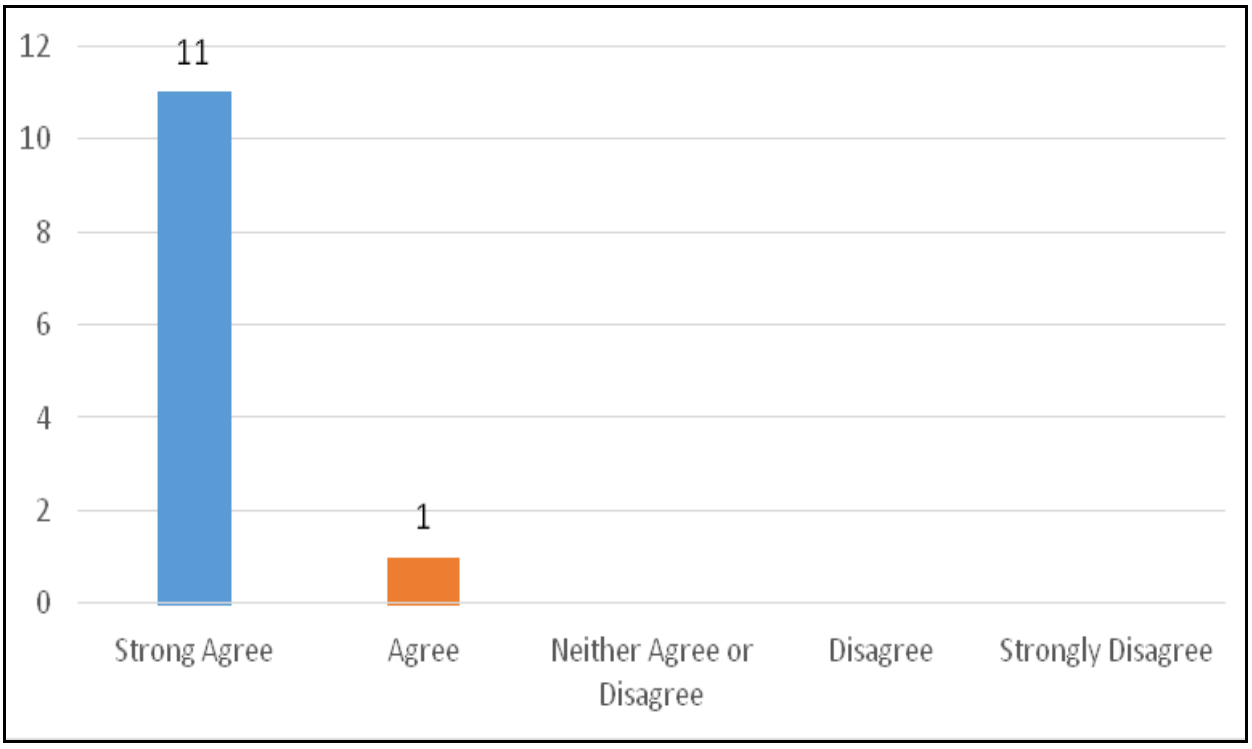


Figure 19. Q4 teachers.

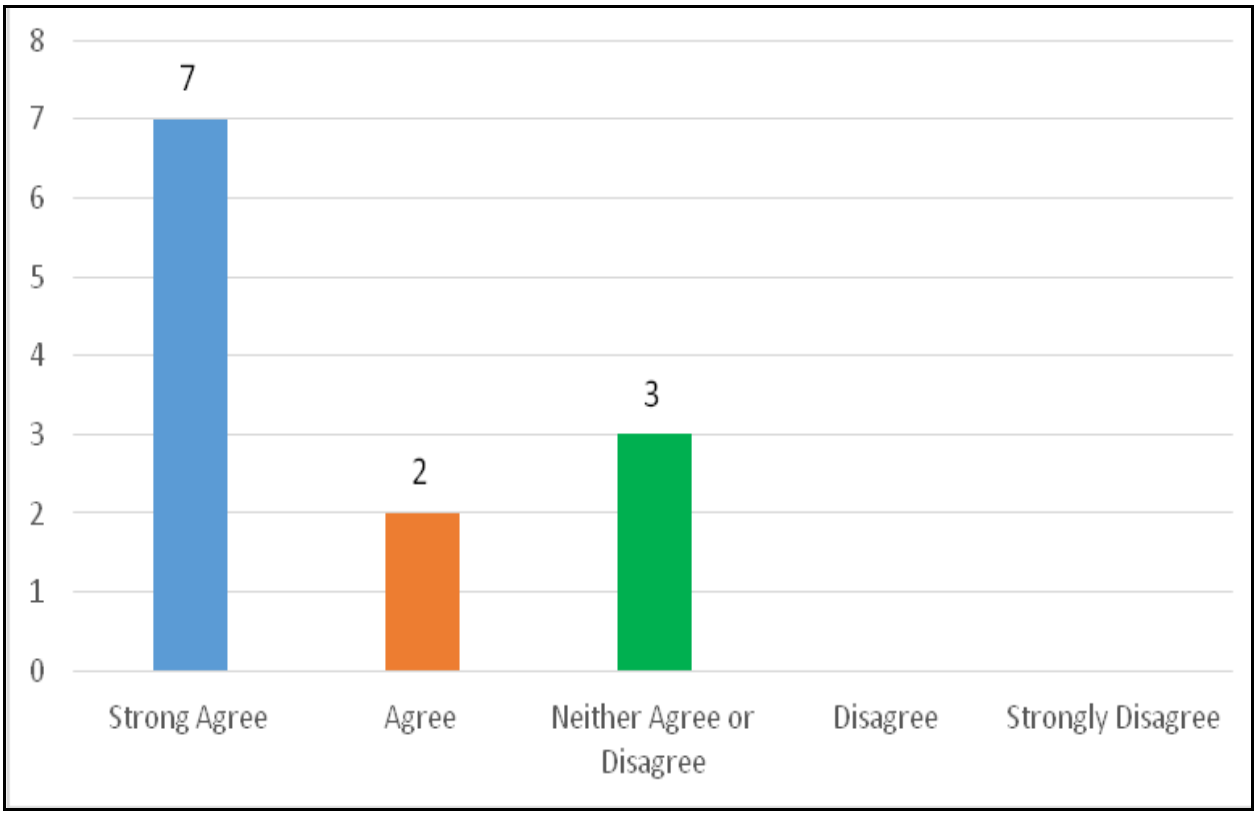


Figure 20. Q5 teachers.

Neither Agreed or Disagreed, and 08% (1 of 12) Disagreed. Seventy-five percent (9 of 12) teachers agreed a credential helps graduates secure a better paying job (see Figure 21).

The seventh question asked, “As a teacher how strongly do you agree with the following statement? Earning a credential helps graduates in further studies or advanced training.” Data indicated 50% (6 of 12) teachers Strongly Agreed, 42% (5 of 12) Agreed, and 8% (1 of 12) Disagreed. Eleven teachers, 92%, (11 of 12) agreed a credential helps graduates in post-secondary education or advanced training (see Figure 22).

The eighth question asked, “How strongly do you agree with the following statement? The ability to earn a post-secondary credit helps graduates make decisions about their educational path.” Data indicated that 42% (5of 12) Strongly Agreed and 58% (7 of 12) Agreed. All twelve (100%) teachers agreed that earning a post-secondary credit helps graduates choose an educational path (see Figure 23).

The ninth question asked, “How strongly do you agree with the following statement? Belonging to a Career-Technical Student Organization (CTSO) better prepares a student for employment or further education.” Data indicated that 67% (8 of 12) teachers Strongly Agreed, 25% (3 of 12) Agreed, and 8% (1of 12) neither Agreed nor Disagreed. Eleven (92%) agreed that belonging to a CTSO aids in preparation of a graduate for employment or post-secondary education (see Figure 24).

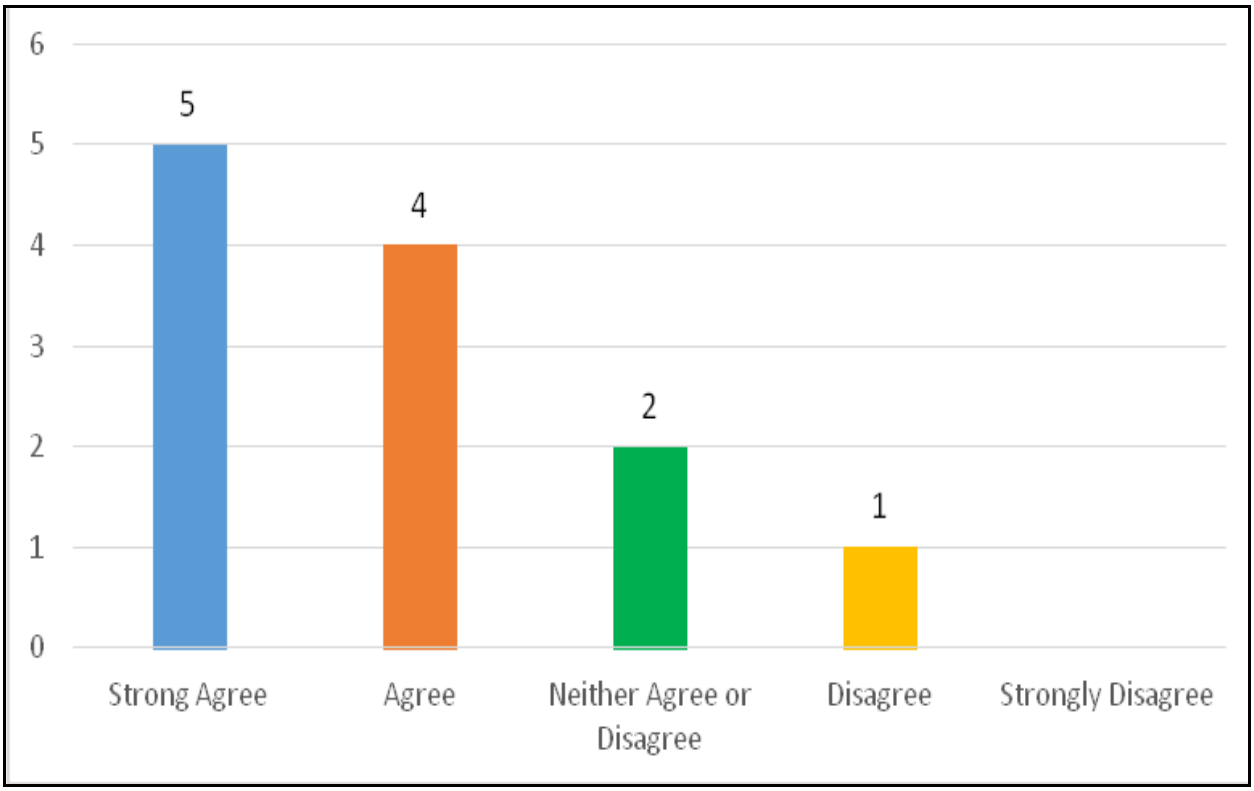


Figure 21. Q6 teachers.

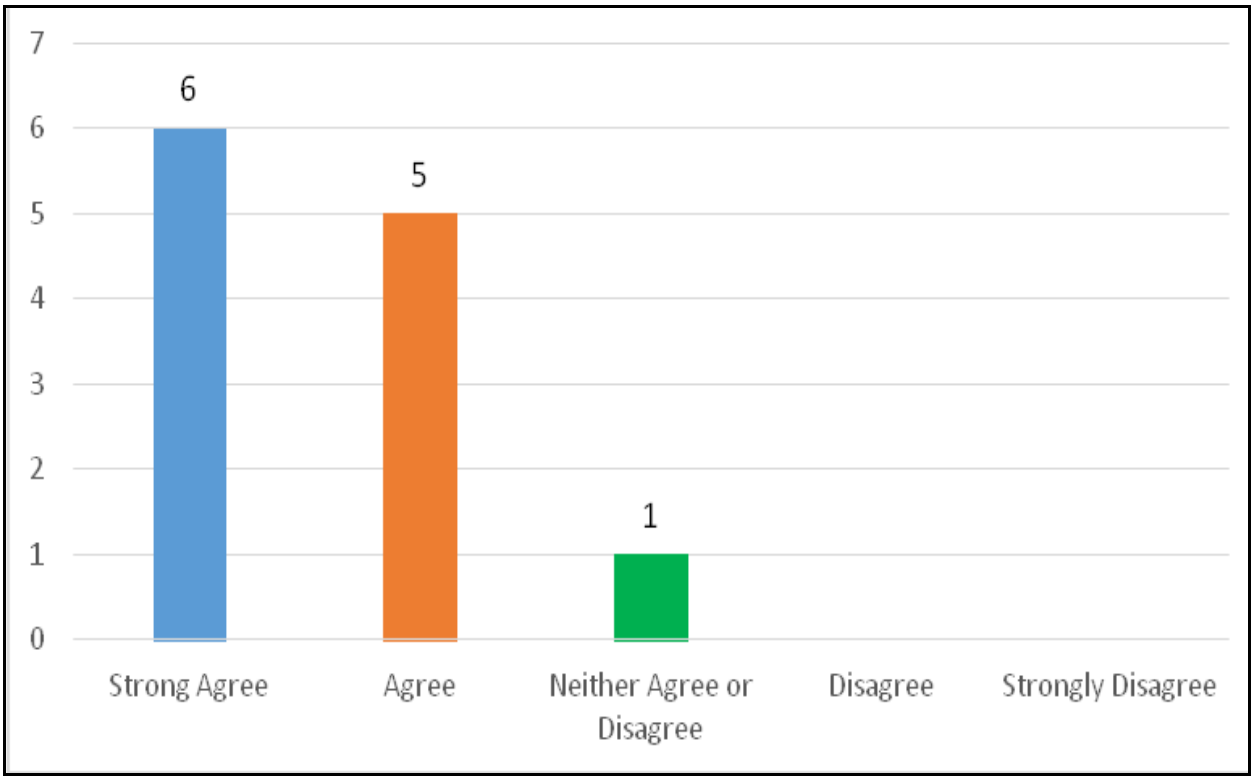


Figure 22. Q7 teachers.

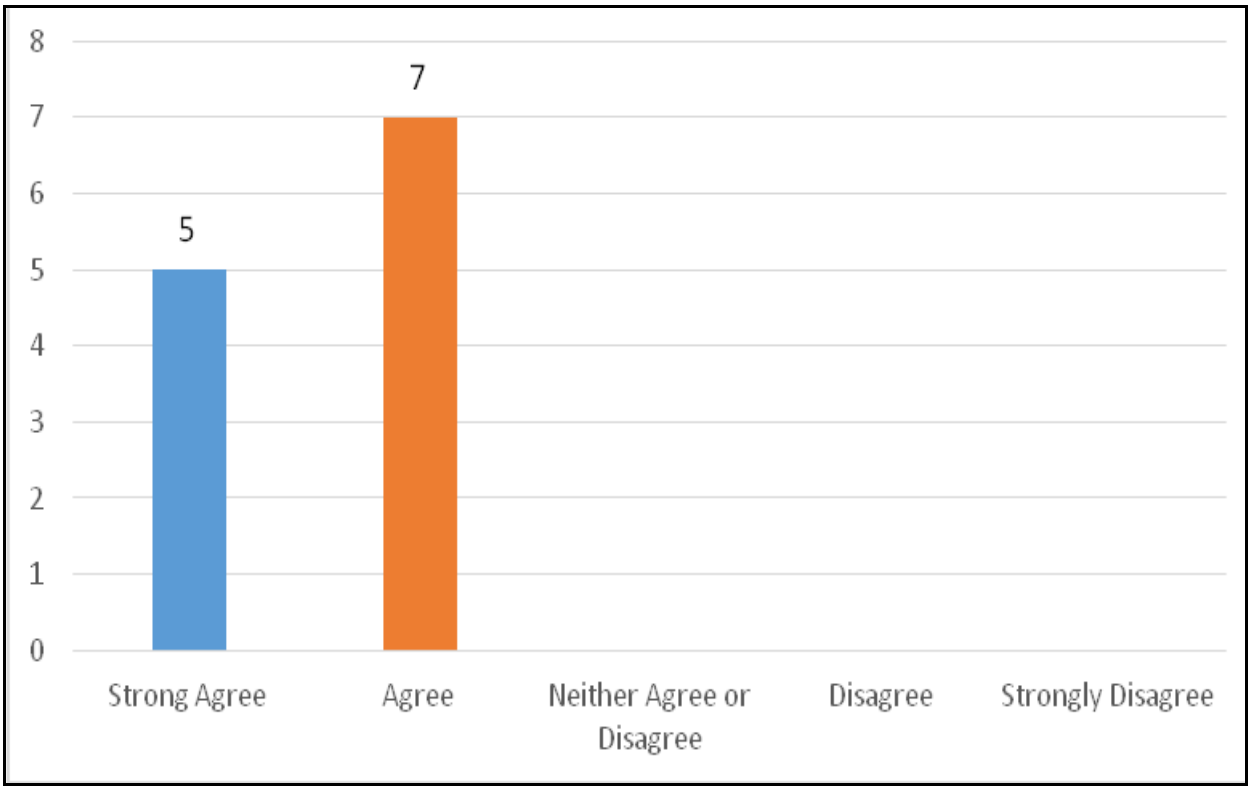


Figure 23. Q8 teachers.

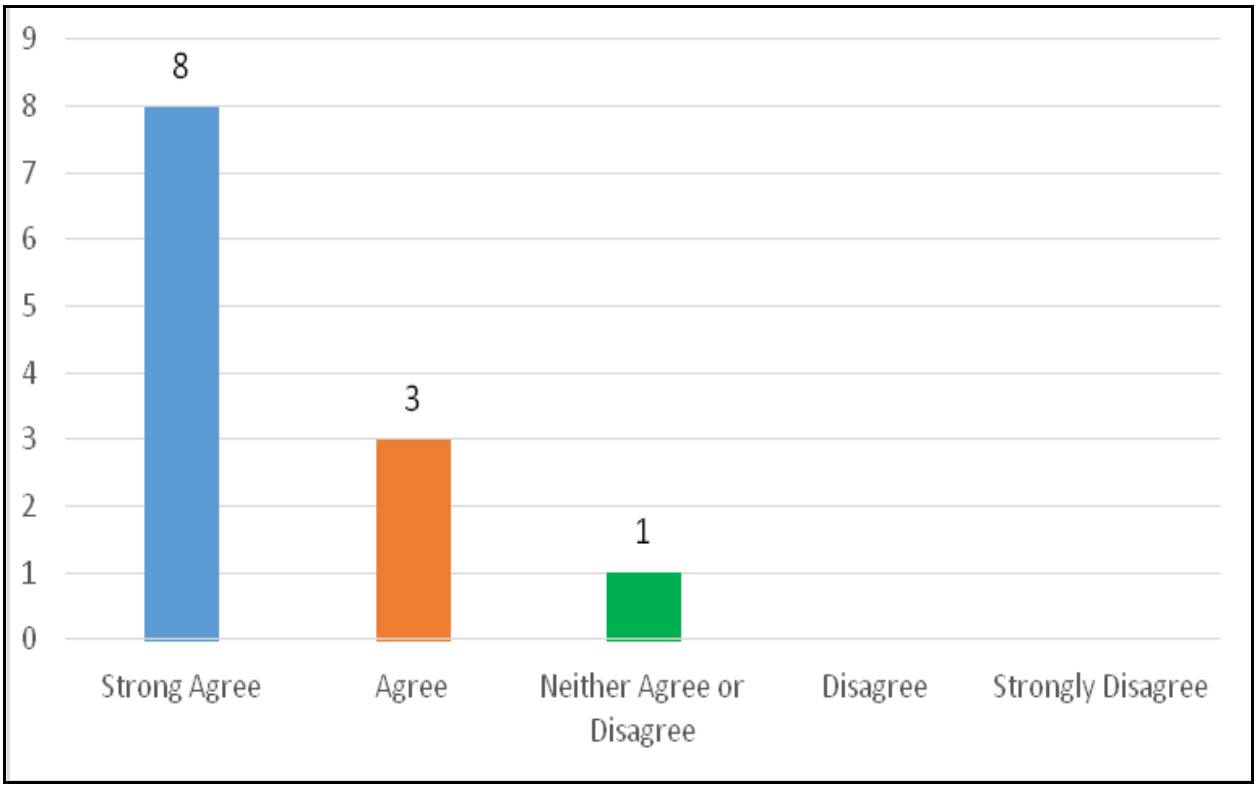


Figure 24. Q9 teachers.

Business Professionals Survey

All of the members of the Robeson Technical Workers Committee (n=11) completed the Graduate Concentrator Feedback Survey adapted for businesses (see Figure 25). The business professionals' survey elicited responses on a Likert scale with numeric values that ranged from Strongly Agree (5), Agree (4), Neither Agree nor Disagree (3), Disagree (2), to Strongly Disagree (1).

The first question business professionals were asked to respond to was, "What is your business type?" The businesses that responded were Agriculture, Employment Services, Manufacturing, and Electrical/Safety, and Education and Research.

The second question asked business professionals, "Do you think certification received at the Robeson County Career Center provides adequate skills to meet your company's needs?" Data indicated 82% (9 of 11) Business Professionals responded with "Yes" and 18% (2 of 11) responded that they "Did Not Know." The majority (82%) of business professionals agreed certification provides adequate skills to meet employment needs (see Figure 26).

The third question asked business professionals, "Do you find it necessary to provide additional training for employed credentialed CTE graduates?" Data indicated that 72% (8 of 11) business professionals responded "Yes", 18% (2 of 11) responded "Don't know," and 9% (1 of 11) responded "No." The majority of business professionals (72%) provided additional training for employed credentialed CTE graduates (see Figure 27).

The fourth question asked business professionals, "How strongly do you agree with the following statement? CTE Education allows graduates to be more connected

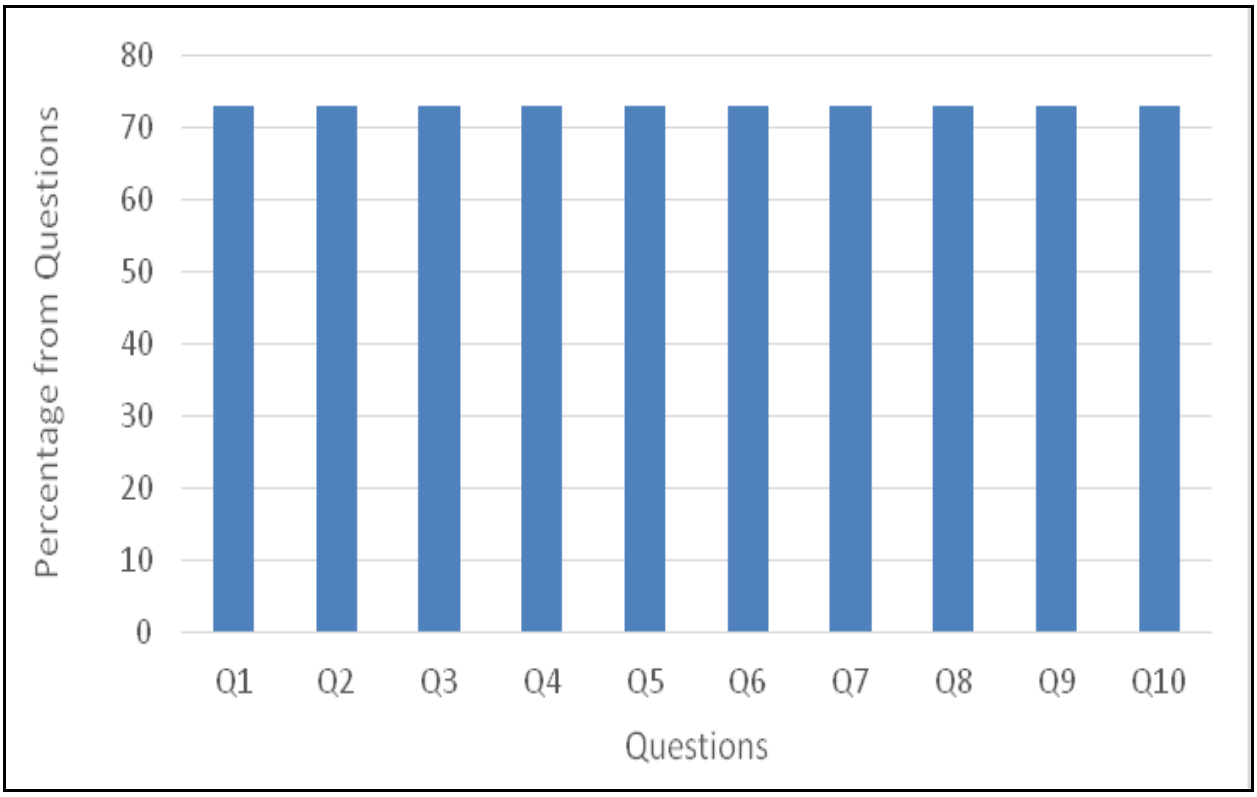


Figure 25. Business response rate.

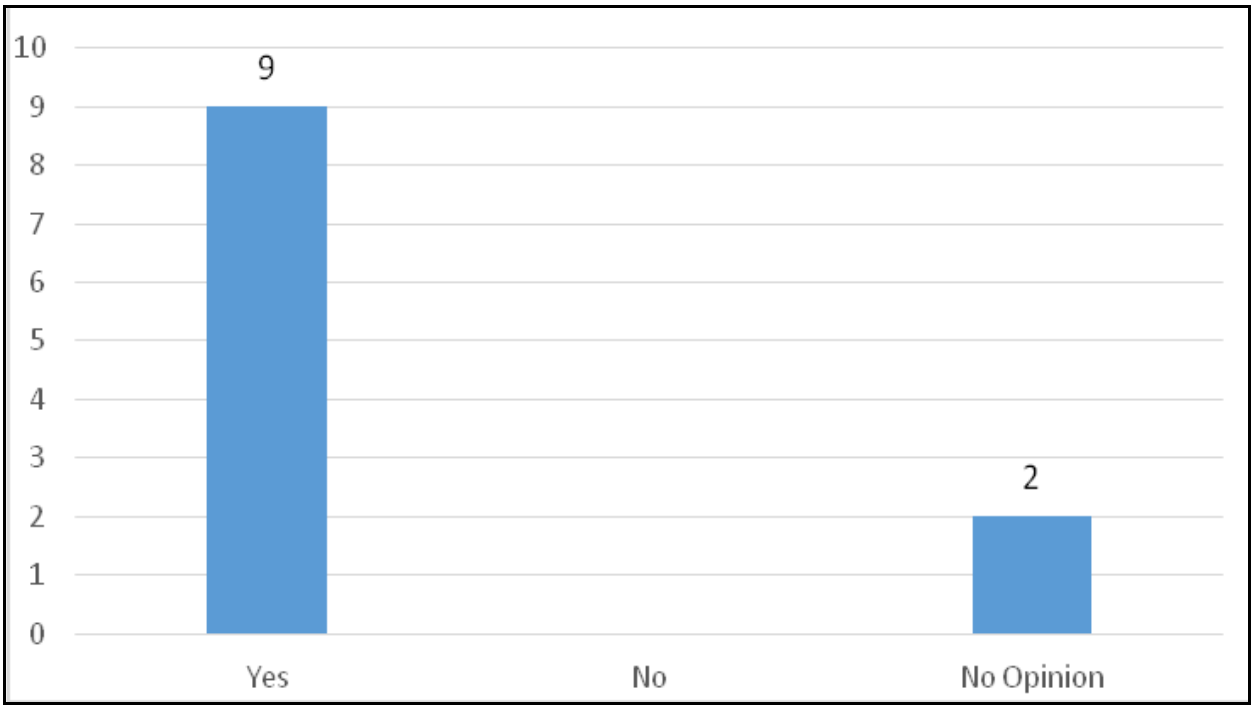


Figure 26. Q2 business professionals.

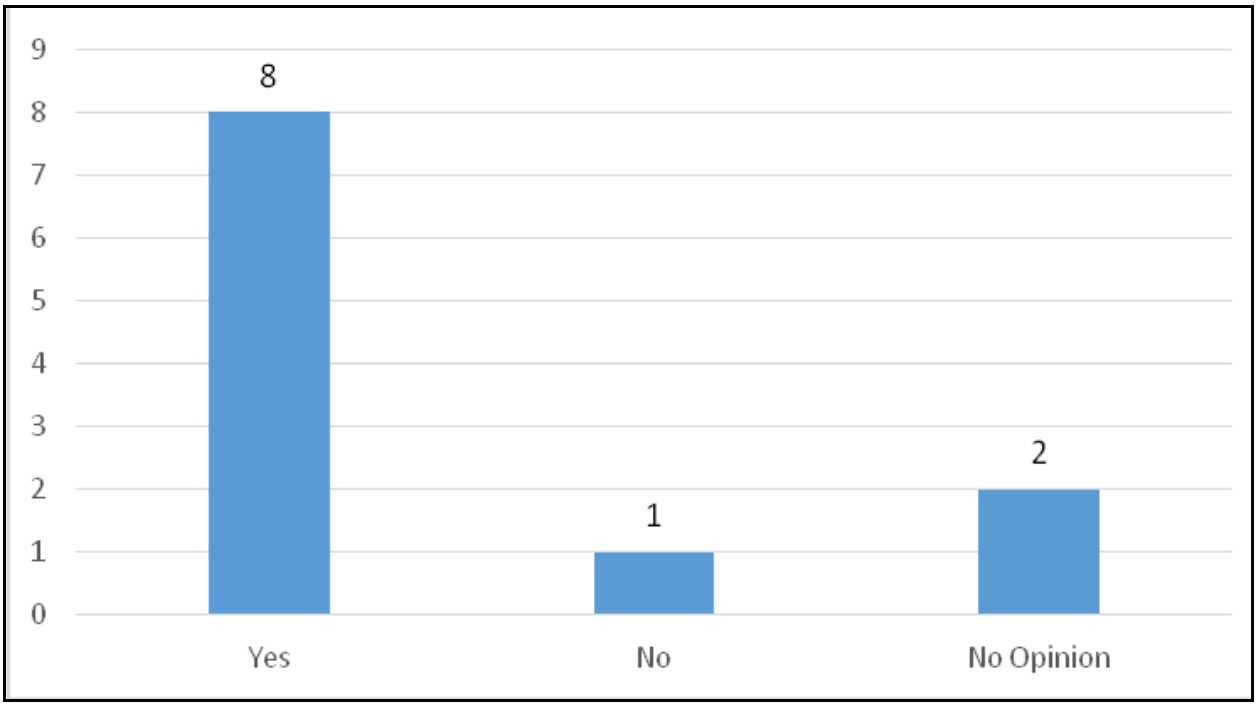


Figure 27. Q3 business professionals.

with their career goals thus keeping them in school." Data indicated 45% (5 of 11) business professionals Strongly Agreed, 36% (4 of 11) Agreed, 9% (1 of 11) Neither Agreed nor Disagreed, and 9% (1 of 11) Disagreed. Eighty-two percent (9 of 11) business professionals agreed CTE Education was a factor in keeping graduates in school (see Figure 28).

The fifth question asked business professionals, "How strongly do you agree with the following statement? Earning a credential helps graduates obtain an internship, work experience, or gain a job." Data indicated 45% (5 of 11) business professionals Strongly Agreed and 55% (6 of 11) Agreed. All business professionals (100%) agreed a credential helped graduates secure employment or obtain an internship (see Figure 29).

The sixth question asked business professionals, "How strongly do you agree with the following statement? Earning a credential helps graduates earn a better paying job." Data indicated 55% (6 of 11) business professionals Strongly Agreed and 45% (5 of 11) Agreed. All eleven (100%) business professionals agreed a credential helped graduates secure a better paying job (see Figure 30).

The seventh question asked business professionals, "As an employer how strongly do you agree with the following statement? Earning a credential helps graduates in further studies or advanced training." Data indicated 27% (3 of 11) business professionals Strongly Agreed, 74% (7 of 11) Agreed and 9% (1 of 11) Neither Agreed nor Disagreed. Ten (91%) of business professionals agreed a credential helped graduates in post-secondary education or advance training (see Figure 31).

The eighth question asked business professionals, "How strongly do you agree with the following statement? The ability to earn a post-secondary credit helps

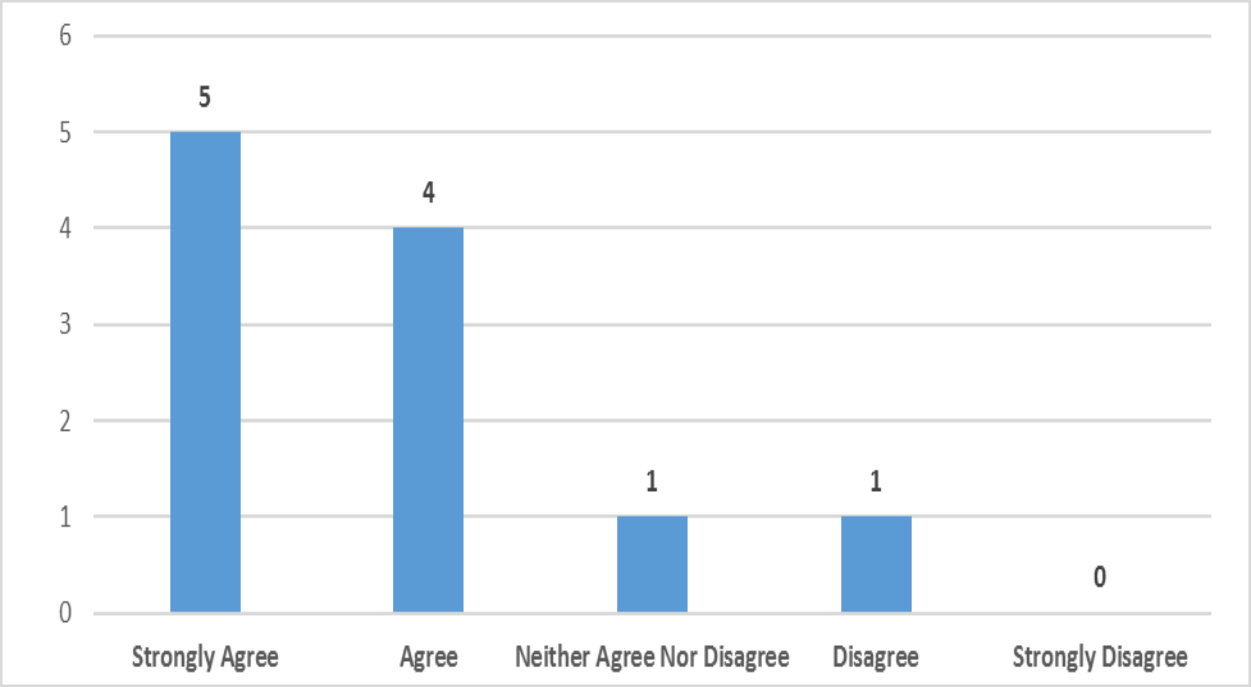


Figure 28. Q4 business professionals.

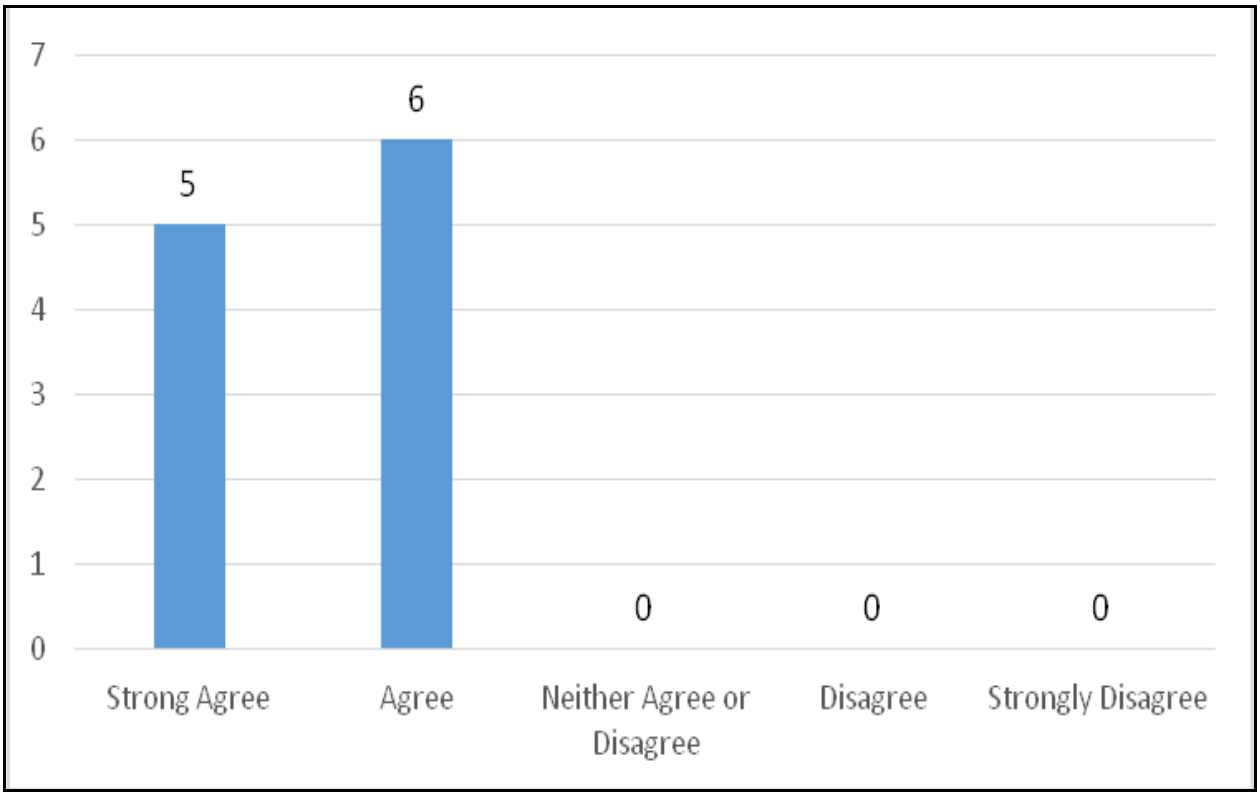


Figure 29. Q5 business professionals.

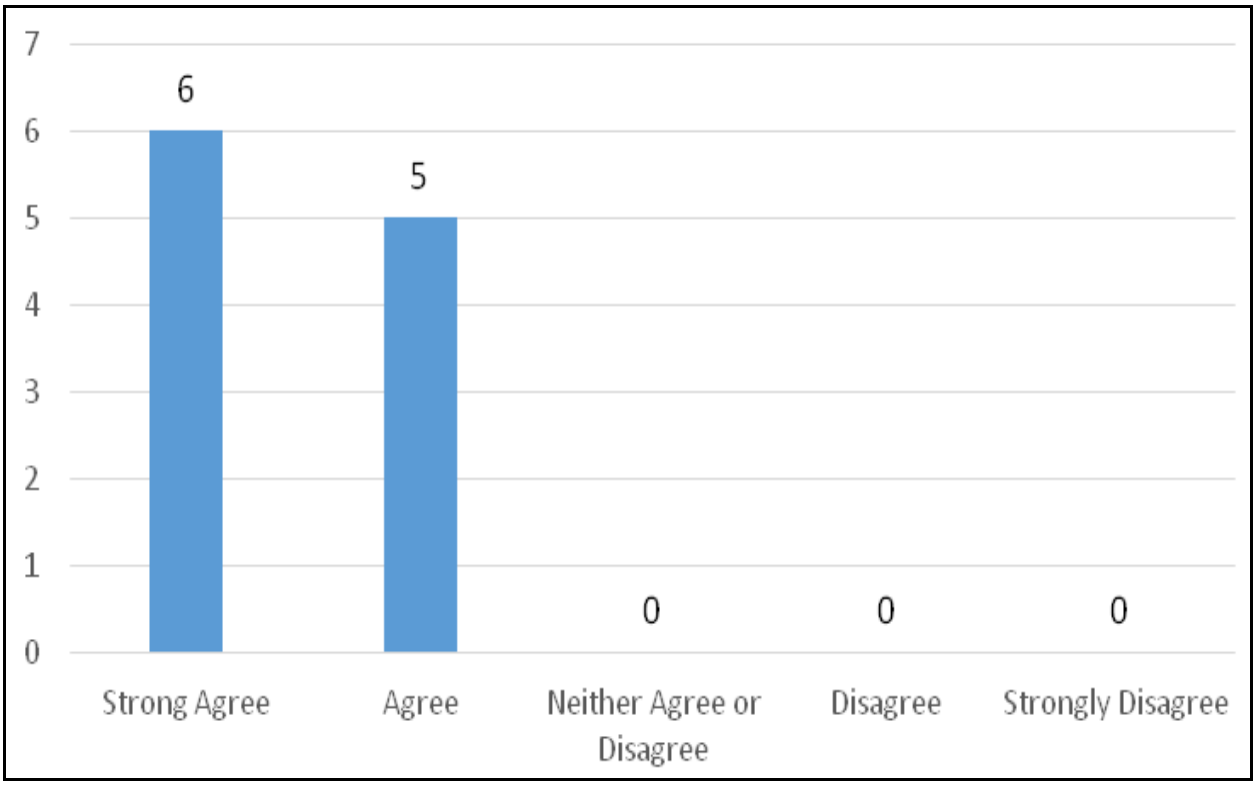


Figure 30. Q6 business professionals.

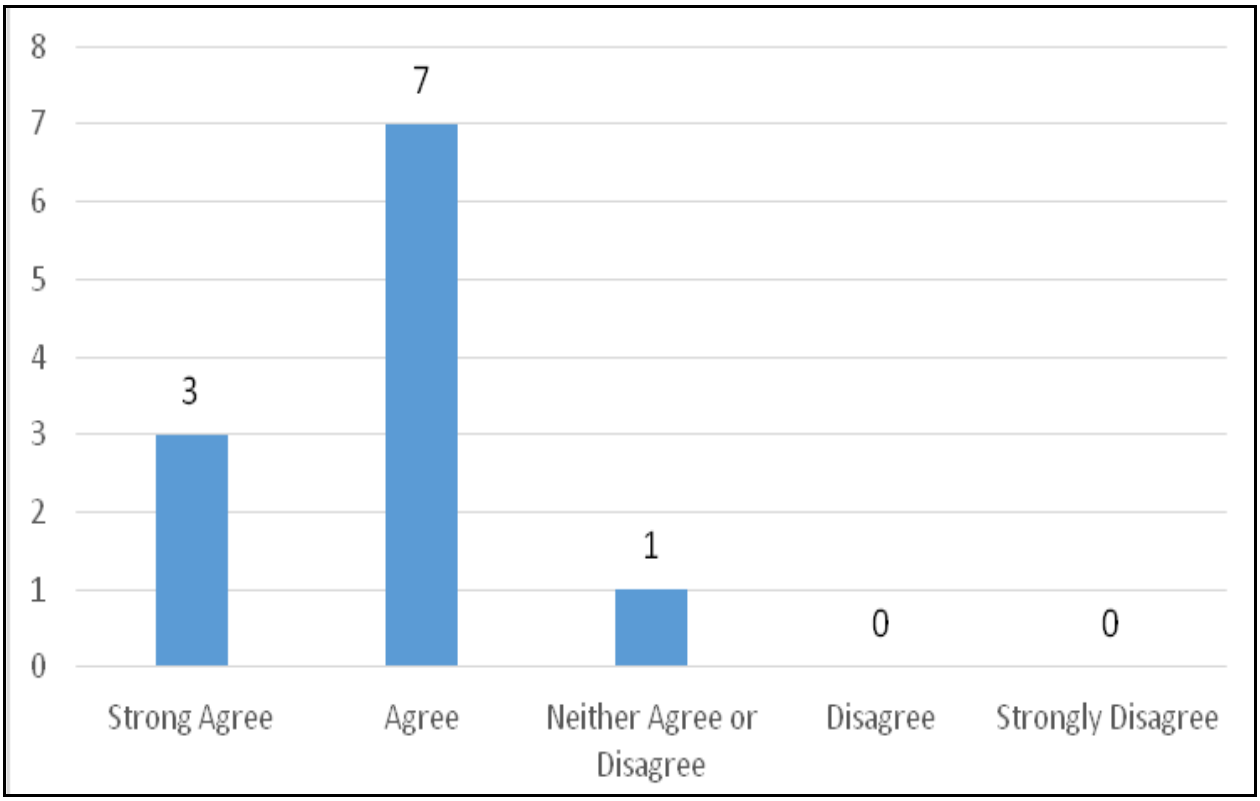


Figure 31. Q7 business professionals.

graduates make an informed decision about their educational path." Data indicated 45% (5 of 11) Strongly Agreed; 55% (6 of 11) Agreed. One-hundred percent of business professionals (n=11) agreed that post-secondary credit helped graduates make informed decisions about their educational path (see Figure 32).

The ninth question asked business professionals, "How strongly do you agree with the following statement? Belonging to a Career-Technical Student Organization (CTSO) better prepares a student for employment or further education." Data indicated 45% (5 of 11) business professionals Strongly Agreed, 36% (4 of 11) Agreed, and 18% (2 of 11) Neither Agreed nor Disagreed. Nine (82%) business professionals agreed CTSO helped prepare graduates for employment or post-secondary education (see Figure 33).

Comparing the survey responses of all three groups - graduates, teachers, and business professionals - graduates showed less agreement that Career-Technical Education played a significant role in the securing of a job, internship, work experience or determining post-secondary education. However, business professionals consistently were in strong agreement that trade and industrial education was influential in preparing graduates for the workplace. Teachers were slightly less in agreement than business professionals, but consistently agreed that trade and industrial education positively influenced graduates' ability to secure a job or internship (see Figure 34).

Graduates' standard deviation for the survey questions was .67, the teachers were .74 and the business professionals were .82 (see Table 2). The standard deviation illustrated that the business professionals and teachers were more readily in agreement that Trade and Industrial Education positively influenced students in preparing them

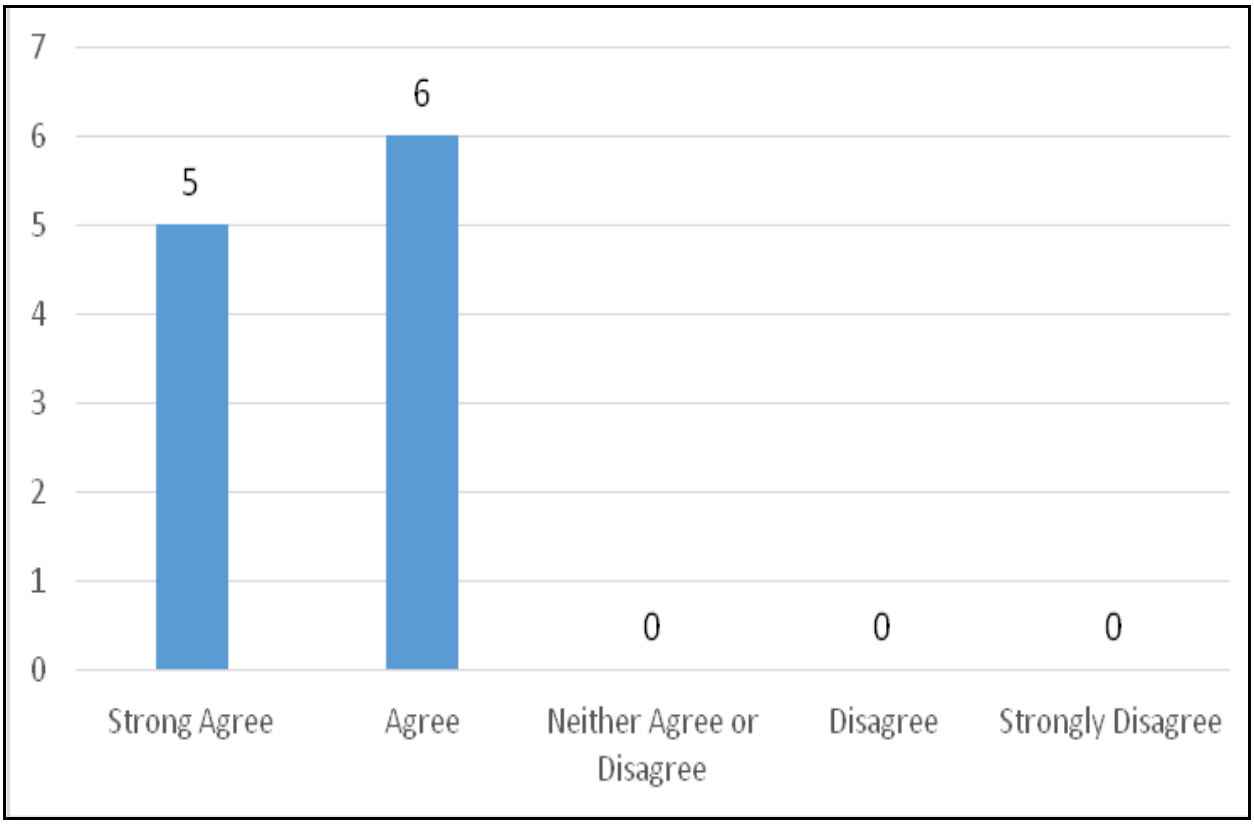


Figure 32. Q8 business professionals.

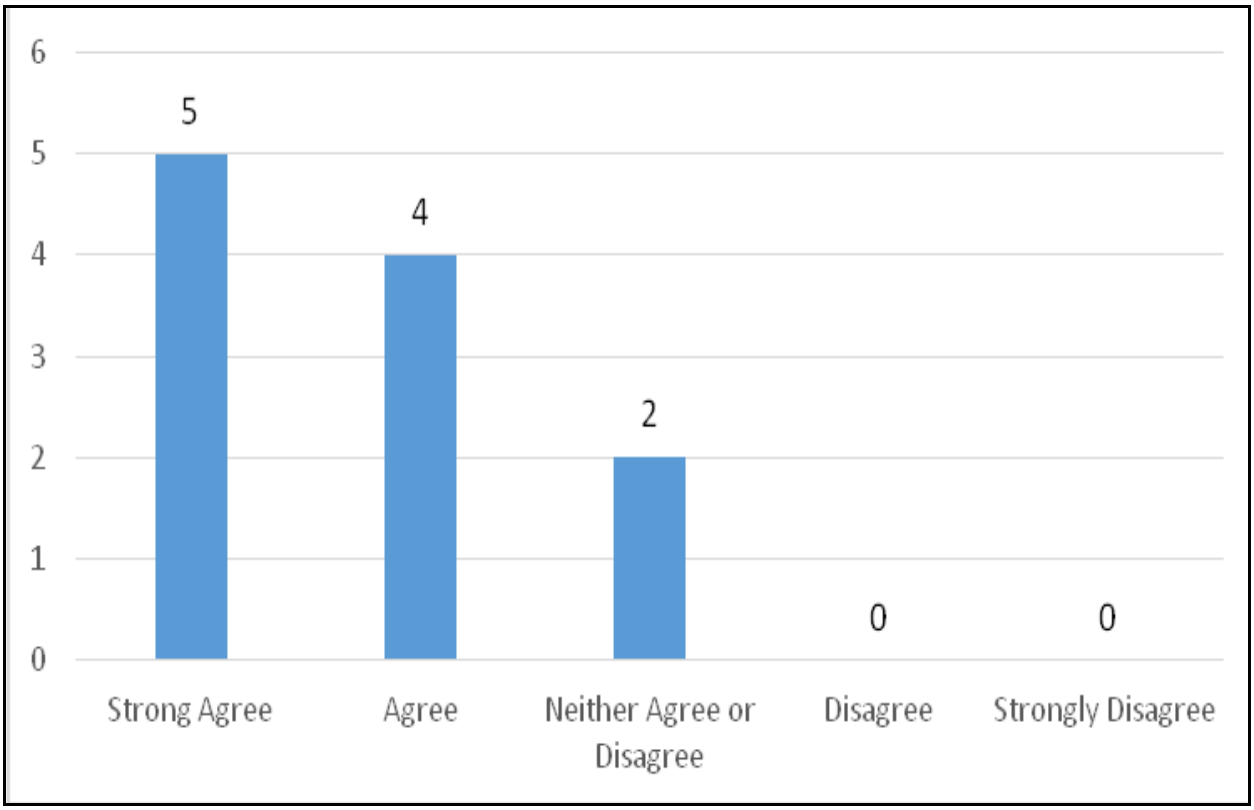


Figure 33. Q9 business professionals.

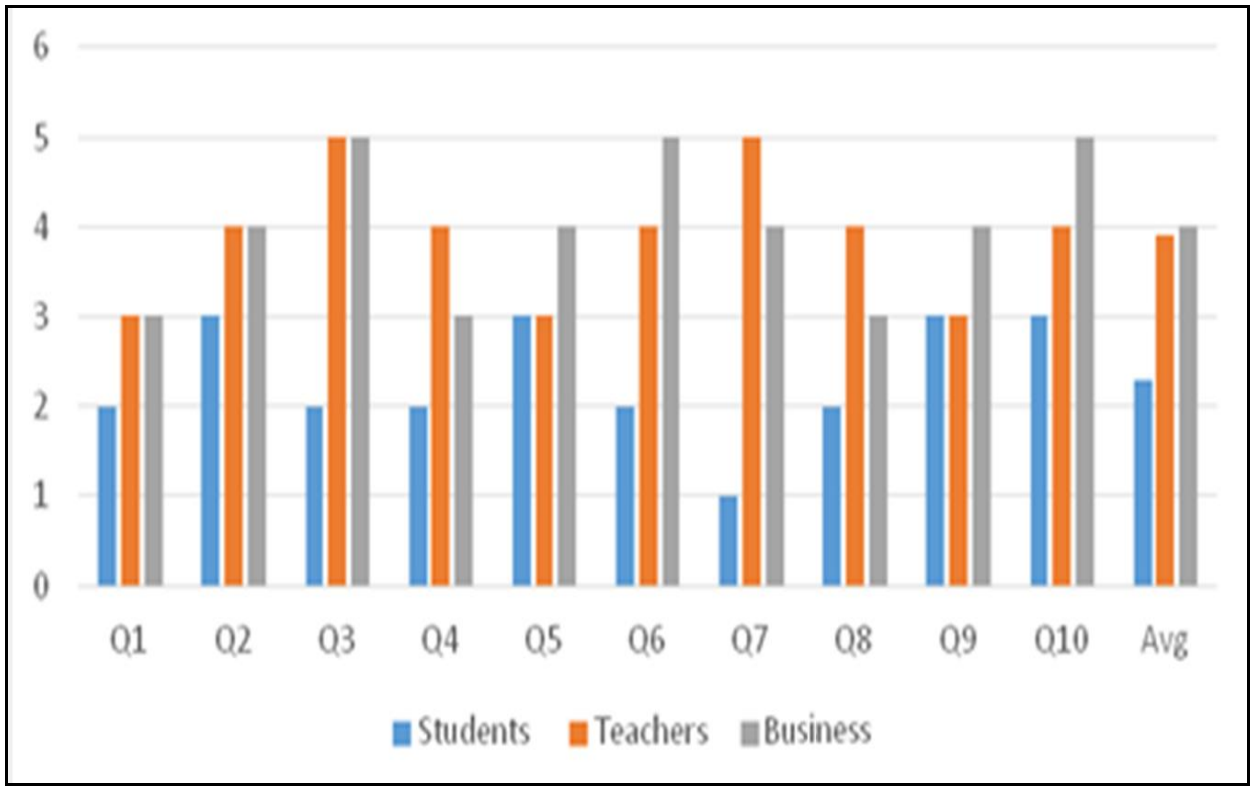


Figure 34. Triangulation analysis.

Table 2

Standard Deviation

Questions	Graduates	Teachers	Business	*M*	*SD*	S/T	T/B	S/B
1	2	3	3	2.67	0.58	-1	0	-1
2	3	4	4	3.67	0.58	-1	0	-1
3	2	5	5	4.00	1.73	-3	0	-3
4	2	4	3	3.00	1.00	-2	+1	-1
5	3	3	4	3.33	0.58	0	-1	-1
6	2	4	5	3.67	1.53	-2	-1	-3
7	1	4	4	3.33	2.08	-4	+1	-3
8	2	3	3	3.00	1.00	-2	+1	-1
9	3	2	4	3.33	0.58	0	-1	-1
10	3	4	5	4.00	1.00	-1	-1	-2
M	2.3	3.9	4	3.4	.95	1.6	1.4	1.7
SD	.67	.74	.82	.44	.54	1.26	.88	.95

for the workforce or post-secondary education. Graduate responses indicated a lack of comprehension or disconnect between what is learned in career-technical education and what is needed to be successful in the workforce.

Qualitative Data Analysis

Teacher Open-Ended Survey Question

The Robeson County Career Center teachers (n=12) were asked to respond in writing to the following question, “As a teacher in the nontraditional setting, in your opinion, what are some of the benefits that nontraditional hands-on instruction affords students versus traditional classroom instruction?” The analysis was based on the written opinion given by each teacher.

Results indicated that 100% (n=12) of the trade and industrial teachers who agreed to participate in the study completed and returned the open-ended survey question. Sample responses were:

- “Students develop leadership skills in a work setting.”
- “Students apply instruction to real-world projects.”
- “Students may discover a like or dislike for a particular line of work.”
- “Students are provided time to develop the ability to explore, explain, and perform.”

The Validation Committee, established for research accountability, developed the open-ended question to be included as part of the survey. After the survey was completed and returned, the responses were listed, reviewed, and categorized by themes. The responses were then analyzed as to the long range and short-range benefits. Long-range benefits lay the groundwork for a successful career (see Table 3).

Table 3

Long Range Benefits of Nontraditional Hands-On Instruction in a Simulated Workplace Classroom versus Traditional Classroom Instruction

Benefits	Number of Comments	Sample Responses
1. Develop and hone critical thinking and problem solving skills.	4	1. "Students are provided time to develop the ability to explore, explain, and perform."
2. Learn the value of teamwork.	6	2. "Students develop leadership skills in a work setting."
3. Build self-confidence and self-esteem	5	3. "Simulated workplace environment allows students to learn soft skills and teamwork."
		4. "Students experience success."

Short-range benefits provide the tools for success in the classroom, competency, application of skills, and introduction to career choices (see Table 4).

Fifty-eight percent (7 of 12) of the teachers stressed the importance of hands-on application of skills. Seventy-five percent (9 of 12) teachers thought that the career centers hands-on instruction in simulated workplace classrooms was the optimum environment for the tactile and kinesthetic learner. All participants' open-ended question responses indicated that hands-on learning experiences produced positive short range and long range benefits.

Business Professionals Open-Ended Survey Questions

The business professionals were asked to respond to the question, "In your professional opinion, do trade and industrial courses better prepare students to apply critical thinking and problem solving skills?'' Results indicated that of the eleven business professionals that agreed to participate, 100% (n=11) returned the survey and answered the open-ended question. The open-ended survey question required a "yes" or "no" answer and an explanation of that answer. Of the 11 that responded, 45% (5 of 11) provided only a "yes" without an explanation. Fifty-five percent (6 of 11) of the participants gave explanations for the "yes" answer.

After the survey was completed and returned, the written responses were listed reviewed, and categorized by themes. The responses reflected the perception of business professionals on the importance of hands-on application of instruction, the ability to think critically, and solve problems (see Table 5).

Table 4

Short Range Benefits of Nontraditional Hands-On Instruction in a Simulated Workplace Classroom versus Traditional Classroom Instruction

Benefits	Number of Comments	Sample Responses
1. Provides optimum learning environment for the tactile and kinesthetic learner	9	1. "The simulated workplace environment gives students more contact time to develop skills."
2. Builds awareness of the options for career choices.	3	2. "Students may discover a like or dislike for a particular line of work."
3. Hands-on application of skills.	7	3. "Students apply instruction to real world projects."

Table 5

Business Professionals Comments to the Question: Do Trade and Industrial Courses Better Prepare Graduates to Apply Critical Thinking and Problem Solving Skills?

Categories	# of Yes Responses/ Yes Explanation	# of No Responses/ No Explanation	# of Yes Responses/ with Explanation	Sample Responses
1. Preparation for chosen career	5	0	6	1. Real life work experience while young generates interest and helps the student prepare for chosen career
	5	0	6	2. It gives them a skillset that other classes do not.
2. Develop and hone critical thinking and problem solving skills	5	0	6	1. Students are better equipped to handle situations in the workplace having already experienced similar opportunities while preparing for credentials.
				2. They are building things or taking them apart and fixing them.

All business professionals who completed and returned the survey agreed that trade and industrial courses prepared graduates for a career and enhanced critical thinking and problem solving skills. The business professionals emphasized the importance of real-life work experiences in preparation for a chosen career and the necessity of developing problem solving skills necessary to handle situations that arise in the workplace.

Summary of Findings

Summary of Findings for Graduate Data

The study findings were based on the responses to the 2013-2014 Graduate Concentrator Feedback Survey.

Study Question 1: To what extent did graduates perceive that the trade and industrial courses taken at the Robeson County Career Center contributed to their employment potential?

It was difficult to calculate the impact of CTE courses due to the lack of a majority of credentialed graduate responses to questions 6, 7, and 8 (see Figures 11, 12, and 13). Most graduates could not answer the question unless they were eligible to earn a credential or had earned a credential after completing the second level trade and industrial course. The survey findings of a minority of graduates who responded to the Graduate Concentrator Feedback Survey, questions 7 and 8, indicated that neither their employability nor their post-secondary education was affected by the completion of trade and industrial courses (see Figures 12 and 13).Therefore, graduates perceived that taking trade and industrial courses did not contribute to employability potential.

Study Question 2: To what extent did graduates perceive that the trade and industrial courses taken at the Robeson County Career Center added to their post-secondary educational potential?

It was difficult to calculate the impact of CTE courses due to the lack of a majority of credentialed graduate responses in questions 7 and 8 (see Figures 12 and 13). The graduates could not answer the question unless they were eligible to earn a credential or had earned a credential after completing the second level trade and industrial course The 2013-2014 Graduate Concentrator Feedback Survey data from NCDPI was not considered an accurate representation of recorded graduate responses. However, the survey findings of the small percentage of graduates who responded to the Graduate Concentrator Feedback Survey, questions 7 and 8, indicated that neither employability nor their post-secondary education was affected by the completion of trade and industrial courses (see Figures 12 and 13). Therefore, graduates perceived that taking trade and industrial courses did not prepare them for post-secondary education. This finding does not corroborate the concept that Career-Technical Education prepares students for a career and a successful transition to industry or post-secondary education (Smith, 2013).

Summary of Findings for Teacher Data

The study findings were based on the responses to the Graduate Concentrator Feedback Survey adapted for teachers.

Study Question 3: "To what extent did Career-Technical educators at the Robeson County Career Center perceive that graduates who completed trade and industrial courses or received credentials were prepared for the workforce?

Responses to questions 6 and 7 indicated all 12 (n=12) CTE teachers Agreed or Strongly Agreed that credentialed graduates are better prepared for the workforce (see Figures 21 and 22). Therefore, teachers perceived that graduates who completed trade and industrial courses or received credentials were better prepared for the workforce.

Summary of Findings for Business Professionals Data

The study findings were based on the responses to the Graduate Concentrator Feedback Survey adapted for business professionals.

> *Study Question 4: "To what extent did Business Professionals perceive that graduates who completed Robeson County Career Center trade and industrial courses were employable?"*

The consensus of the business professionals was that Career-Technical Education had a positive effect on graduate employability. One-hundred percent (n=11) business professional participants Strongly Agreed or Agreed, a credential helped graduates secure a better paying job (see Figure 30). Ninety-one percent (10 of 11) business professional participants Agreed or Strongly Agreed that earning a credential helped graduates in further studies or advanced training (see Figure 31). Therefore, business professionals perceived that graduates who complete Robeson County Career Center trade and industrial courses are employable**.**

Discussion of Results

Graduate Surveys

The theme that continually surfaced among the Graduates' Concentrator Feedback Survey data implied that graduates do not value Career-Technical Education's second level course offerings as career empowering or as a tool that is

valuable for future employment. This does not corroborate the findings from the literature review (see Chapter 2). Graduates are missing the connection between what is learned in school and what is needed in the workplace. Without basic skills in reading, math, and writing, students cannot build an academic foundation of knowledge. Graduates are facing the fact that academic deficiencies restrict future achievement (Vandal, 2011). Few students enrolled in newly offered trade and industrial second level courses that required state testing to receive credentials. This finding indicated issues of validity associated with the Graduate Concentrator Feedback Survey. The findings from this study identify issues with the survey that NCDPI may use to edit the survey to achieve the original goal to maintain and/or improve present career-technical course offerings. Investigation of the data source revealed that credentialed status was originally offered beginning in 2011. Questions 6, 7, and 8 had few graduate responses. The only graduates eligible to answer those questions were students who had chosen to be tested and received course credentials. A reliability issue was the loss of Graduate Concentrator Feedback Data when NCDPI switched data management systems from "Elements" to "Power Schools." Combined with student apathy, the loss of data, and few students who gained credentials, the amount of graduate survey data were less than anticipated.

The amount of survey data were less than anticipated due to students' lack of connection between CTE and the potential for employability and continued education. However, it is the responsibility of the teacher to ensure this connection is made for the students. Teachers need to integrate into the curriculum a unit of study on the benefits

of credentials that emphasizes the connection between what is learned in class, obtaining a credential, and being better prepared for the workforce.

Teacher Surveys

The CTE teachers perceived graduates to be prepared for the workforce or for the continuation of post-secondary education. The Career Center teachers indicated that students who took courses in trade and industrial education excel in a simulated work environment, experience success, develop leadership skills, acquire soft skills, and learn to work as a team member in the nontraditional classroom. There was a consensus that students apply instruction to real world projects, and hone critical thinking skills through exploration, application, and problem solving. According to the literature review in Chapter 2, Science, Technology, Engineering, and Math (STEM) industries need employees who can think critically and problem solve. Manufacturing executives strongly suggested that people who can think could be taught anything necessary to perform their jobs adequately (Vigeant, 2015). Furthermore, STEM encourages educators to promote curiosity in elementary school so students will make a conscious effort to think and ask questions. STEM skills contribute to higher order thinking in the disciplines of Science, Technology, Engineering, and Math (Vigeant, 2015). Developing students' soft skills is considered as important as technical abilities or having a specific skill set. Needed soft skills to succeed include the ability to communicate verbally and written, interpersonal skills, exhibit time management, self-motivation and leadership skills. Industry wants employees who have higher order thinking skills, can rise to a challenge, and be resilient. Academic excellence is a necessity, but being passionate and asking questions with the right attitude are traits of

the ideal employee (Vigeant, 2015). Additionally, teachers agreed that a benefit of Career-Technical Education is helping students make positive career choices while realizing the correlation between the academic disciplines and trade and industrial courses. According to the U.S. Department of Labor, it is urgent that today's student receive adequate academic training as a foundation for post-secondary education or to secure employment (Hecker, 2005). Teachers must continually be involved in staff development to be updated on current trends in their areas of education, technology, and industry. Ultimately, the teacher is the connection between the student, the content, and the application to the real world of work.

Business Professional Surveys

Business professionals perceived that CTE courses prepared graduates to enter the workforce or to continue their chosen educational goals (see Figures 31, 32, and 33). As stated in the literature review, research showed that eighty percent of the fastest-growing jobs in the US require some post-secondary education (Hecker, 2005). The jobs in today's economy are different from that of previous generations. The employment of people who could obtain a job without special skills has declined. Today, good jobs require a variety of skills and a knowledge base. Furthermore, the economy emphasizes the acquisition of a skill set while our Gross Domestic Product (GDP) is barely growing. It is difficult to engineer an economic recovery with a portion of the population prospering and the economic disadvantaged portion not able to keep up. The untrained need a trade or skill that facilitates their employment and enables them to become a contributing citizen (Payne, 2015).

Businesses contribute to the growth of a community in multiple ways. Businesses bring jobs to community, stimulate the local economy, reduce unemployment, increase the tax base, become a team player in community development, and collaborate with educational institutions to provide updates on employment trends. Partnerships are important between CTE students, teachers and business professionals to continually engage the stake -holders to improve the educational outcomes and employability of career center graduates.

Triangulation of Perceptions

A comparison of the three sample groups of graduates (n=158), teachers, (n=12), and business professionals (n=11) indicated a positive correlation between the perceptions of the teachers and business professionals. Both of these sample groups perceived the graduates to be prepared for employability or post-secondary education. However, there was a disconnect in the perception of the graduates relating to employability or post-secondary education. Graduates do not value CTE as career empowering or as a tool for future employment. This does not corroborate the findings from the literature review (see Chapter 2). Graduates are missing the connection between what is learned in school and what is needed in the workplace. Graduates are facing the fact that academic deficiencies restrict future achievement (Vandal, 2011).

Negative images of manual labor have caused people to avoid industrial jobs and resort to academic coursework at four-year colleges. Without industry, our economy will cease to provide the conveniences that we have grown to enjoy like safe bridges, indoor plumbing, air-conditioned homes, and paved roads (Rowe, 2011).

The data indicated agreement in the perceptions of the teachers and business professionals that CTE prepared graduates for employability and post-secondary education. This would lend itself to initiating a strong collaboration between the career center and business professionals to provide opportunities to see how CTE opens options for employability. Options may include work-based programs such as internships and apprenticeships. The study findings encourage a collaborative approach to address the improvement of Career Technical Education at Robeson Career Center. Data indicated that there is a disconnect in communication between teachers and students resulting in non-credentialed graduates. Based on the findings of graduate data, the Robeson County Career Center does not meet expectations in developing a skilled workforce as perceived by graduates. Steps should be taken to engage the student directly in what they are learning and in the understanding of the benefits of credentials and the secondary impact on growing the community's economy.

Recommendations

Based on the results of this study, recommendations were made in the following areas of practice and research to better prepare graduates for employability and post-secondary education.

- Business professionals, graduates, and teachers should collaborate to develop a unit of study on the benefits of credentials that emphasizes the connection between what is learned in class, obtained by a credential, and being better prepared for the workforce. This may result in more credentialed graduates, thereby improving potential for employment.

- Create a school-based advisory council, as a model for collaboration, consisting of teachers, students, and business professionals whose goal will be to improve educational outcomes of trade and industrial students and recruit businesses and industries.
- Emphasize soft skills in the curriculum to hone communication skills, exhibit professional etiquette in the workplace, and refine interpersonal skills. The acquisition of soft skills should result in increased potential for employability and job productivity.
- Establish partnerships between educational institutions, industries and businesses to assess the skills and knowledge needed in the workforce.

This partnership will provide CTE teachers opportunities, such as staff development, to continue expanding their knowledge base in their specific trade and industrial profession. Opportunities of employability should increase as CTE educational outcomes align with ever-changing industrial workforce demands.

- Responsibility for tracking Graduates Concentrator Feedback Survey data should be delegated by NCDPI to individual school districts to better access CTE local programs to determine effectiveness based on strengths and weaknesses. Currently the results of the survey are not shared with local districts that could adjust curriculum to positively affect the educational outcomes of trade and industrial programs.
- Develop a survey that better captures perceptions of the effectiveness of trade and industrial education in the preparation of graduates for employability and post-secondary education. Graduates should be assessed

more specifically in the chosen educational cluster of trade and industrial courses instead of the general questions that pertain to current employment or education. For example: Earning a credential in welding (credentialed area) helped me secure employment or advanced training. Feedback from credentialed graduates should improve development and expansion of trade and industrial courses that positively impact employability and industrial recruitment.

- Increase credentialed graduates to meet workforce deficits. Credentialed graduates decrease training time and resources needed as new employees. Credentialed graduates may eliminate Industrial deficits thereby decreasing unemployment and stimulating the job market.
- Increase student involvement in the established work-based programs.

A student may find interest in automotive mechanics and learn that completion of the course would award credentials for a higher paying job upon graduation (Smith, 2013). Based on the findings, business professionals want to hire graduates who have earned a credential and are better prepared for the workforce. Furthermore, students who complete internships or apprenticeships have experience in on-the-job training and require less time training and resources.

Recommendations for Future Research

Based on the findings of this study, further research in the following areas may be beneficial to the educational system and for economic development:

- Financial impact study to determine how the local economy is affected by CTE credentialed graduates' residency or relocation following graduation. The

credentialed graduates affect on the recruitment of industries as it pertains to the available skilled workforce.

- A study to determine the connection between hands-on learning, as occurs in CTE instruction, the dropout rate, truancy, and disciplinary referrals. Addressing learning styles are important to help students understand the curriculum. Students learn in different ways which could determine comprehension and retention of curriculum. CTE may appeal to tactile and kinesthetic nontraditional learners who have difficulty succeeding in the academic classroom. Furthermore, student achievement levels should increase student competency. CTE education may give the nontraditional learner opportunities to learn a skill set or trade that increases the potential for employment and benefits the local economy.

Conclusions

The Graduate Concentrator Feedback Survey is one of the evaluation tools used by the State of North Carolina to clarify and validate graduates' experience in Career-Technical Education and the impact of CTE in workforce preparation and post-secondary education. The feedback analyzed how well CTE was meeting graduates' needs. The data were meant to assist educators in developing strategies to improve classroom performance (NCDPI, 2006). However, according to the findings of the study, the data were not analyzed, shared, or made available to CTE teachers.

The lack of a response to many of the Graduate Concentrator Feedback Survey questions by graduates is an indication of the small percentage (3%) of credentialed graduates (see Figures 11, 12, 13, and 14). Teachers are given the challenge of

locating and contacting the previous year's graduates and completing the survey with an end result of at least 95% of the contacts made and surveys completed. The teachers are told that the completion of the Graduate Concentrator Feedback Survey has a direct impact on annual teacher allotment and the educational funds appropriated for the school district.

Graduates are given the same reasons as teachers to complete the survey about the importance of answering all survey questions. There is a growing indifference among graduates when asked to complete any document that is in a test or survey format. Graduates do not always answer the survey due to an apathetic attitude and the lack of connecting the survey to the value of education. The graduates' apathetic attitude is a major factor that should be considered; however, attitude is not measured on the survey. This conclusion was based on the researcher's years of experience dealing with high school students. Students may not understand the connection between education, future employment, or the practical application to short or long-term career goals. The continuous student testing, lack of concern for test scores, and the state and national demand to continually test students may have resulted in building a student bias that disregards the importance of testing results and moreover, survey implications. If graduates cannot comprehend information and are educationally unprepared, the learning process must be restructured (Griego, 2011). Part of the Perkins Law stipulates that CTE must continually examine its educational success. The national graduation rate is 75%, in comparison to the 90% graduation rate of students who concentrate on CTE programs (NCDPI, 2010).

“From 1996 until 2003, we lost 9,000 jobs. Since then, it has been a constant battle, especially with South Carolina, Georgia, and Virginia, to recruit industries and create new jobs” (Cummings, 2016). The loss of jobs to neighboring states may be in part due to the funding support for CTE education. For example, South Carolina currently has fifty-nine career centers as opposed to nine in North Carolina.

Surveyed data supplied by the business professionals of Robeson County and surrounding areas indicated a positive reception of graduates who have earned a credential in the Trade and Industrial courses offered at the Robeson County Career Center. Collaboration of secondary and post-secondary educational institutions creates an advantage for young adults by presenting a pathway towards successful career options. A student’s future educational preparedness may depend on collaboration between educators and their expectations of academic performance. This ensures graduates’ readiness for post-secondary education or employment. It is important for rural America to have vocational training or instruction coordinated with current practices to meet the needs of the local workforce. The application of knowledge is apparent to students through career-technical education as they explore career goals (Levesque et al., 1995). The second level or the advance course in Career-Technical Education curriculum allows the student to gain skills and credentials that increase employment opportunities. The cooperation and collaboration between educational institutions by linking or grouping specific academic diploma paths expedite degree programs for graduates.

To bring industry and good paying jobs back to Robeson County, and to keep those industries and businesses currently in the county, a partnership between the

educational institutions in Robeson County, businesses, and industries needs to be established. By working together and applying the knowledge gained from the surveys, and with additional Career-Technical Career Centers, the educational system can be improved to provide students with real-world 21st century skills. Schools can produce graduates ready to enter the workforce and meet the skilled labor demands of industries and businesses, thereby attracting industries to Robeson County and North Carolina.

The educational system must understand and accommodate the ever-changing demands of the globally competitive economy. The workforce does not benefit each time the limitless aptitude of a young person is not developed. The talents and contributions of individuals cannot contribute when opportunities are not offered. Furthermore, the entire country, state, and county lose when a student does not graduate from high school, fails to enter the workforce, or does not realize their potential as a contributing citizen. When a school system makes the choice to help a young person reach their potential, the infinite world of occupations and the satisfaction of a successful, self-fulfilling career becomes a reality. The impact of a student's career decision can be life altering.

We have a chance to improve the public school system by offering the 21st century students new educational options specific to their innate talents. No longer should the academically gifted students be the only celebrated graduates. Recognition and opportunities must be given to those with skills, technical abilities, and problem-solving aptitudes, which are invaluable in today's demanding economy. A new workforce generation is needed reminiscent of those that helped build America, produced equipment that won two World Wars, and today remains the foundation of an

aspiring industrial nation. The 21st century student is curious, ambitious, and tenaciously technology driven. It is time for the educational system to catch up with the world's global economy and offer this new generation, through nontraditional learning, the knowledge and skills that will produce a globally competitive, industrial workforce.

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APPENDIX A: COURSES OFFERED AT SOUTH CAROLINA CAREER CENTERS

Ag Technology courses are designed to teach technical knowledge and skills for entry-level positions in the application of modern technology in the production of food and fiber. Strategies for economically using facilities, land, water, machinery, equipment, pest control, capital, labor, and management in the efficient production of plant and animal products are applied to relevant, current scenarios. Possible Career Pathways include Agricultural Worker Supervisor, Agricultural Inspector, Food Scientist and Technologist, and Forester (Dillon County Technology Center, 2013).

Introduction to Horticulture includes organized subject matter and practical experiences related to the culture of plants used principally for ornamental or aesthetic purposes. Instruction emphasizes knowledge and understanding of the importance of establishing, maintaining, and managing ornamental horticulture enterprises. The Career Pathway includes Transportation Distribution & Logistics (Dillon County Technology Center, 2013).

Building Construction I is a prerequisite to all Level 1 craft courses. Its modules cover topics such as Basic Safety, Communication Skills, and Introduction to Construction Drawings. Completing this course gives the student the basic skills need to continue their education in any craft area he or she chooses. Key content includes: Nine modules providing coverage of Basic Safety, Introduction to Construction Math, Introduction to Hand tools, Introduction to Power Tools, Construction Drawings, Basic Rigging Communication Skills, Basic Employability Skills and Introduction to Materials Handling (Dillon County Technology Center, 2013).

Building Construction II grounds the trainee in the basic knowledge and principles of carpentry, masonry and concrete finishing. He or she will become skilled in different phases of a project. Upon completing this course, the trainee will be able to conduct site layouts; interpret construction drawings; frame walls, ceilings, and stairs of structures; and perform quality concrete and brick work. Key content includes: Site Layout-Distance Measurement and Leveling; Introduction to Concrete; Reinforcing Materials and forms; Handling and Placing Concrete; Introduction to Masonry, Masonry units and installation techniques; Floor systems; and Wall, Ceiling, Roof framing and Basic Stair Layout (Dillon County Technology Center, 2013).

Building Construction III provides the student with the basic knowledge and principles of electrical work, HVAC and plumbing. Upon completion of this course, the student will be able to install the proper wiring and piping for electrical, HVAC and plumbing systems. Key content includes Electrical Safety; Residential Electrical Service; Introduction to HVAC; Introduction to Drain, Waste and Vent Systems; Plastic pipe and fittings; and Copper pipes and fittings (Dillon County Technology Center, 2013).

Building Construction IV provides the student with the basic knowledge and principles of Interior and Exterior finish work. Upon completion of this course, the student will be able to install interior finishes, exterior finishes and roof applications. This course precedes a career pathway in architecture and construction including carpenter, construction worker, or sheet metal worker (Dillon County Technology Center, 2013).

Accounting I is designed to help the student develop the skills necessary for the highly technical interaction between accounting and business, to develop an understanding of the steps of the accounting cycle as applied to several different kinds

of business operations, and to develop an understanding of accounting concepts, principles, and practices. Use of the computer in simulated activities gives the student an opportunity to see the advantages of technology in accounting procedures (Dillon County Technology Center, 2013).

Business Law is designed to provide the student with knowledge of the legal environment in which a consumer operates, to provide the student with knowledge of the legal environment in which a business operates, and to provide the student with knowledge of legal principles (Dillon County Technology Center, 2013).

Foundations of Animation teaches graduates how to create and deliver interactive content across desktops and devices with a focus on establishing a working knowledge of animation tools and techniques. Foundations of Animation examines the features of Adobe's popular Flash software that is the professional standard for producing high-impact Web sites using animation, video, text, graphics, and audio. Graduates create rich media applications that span a wide variety of digital devices from desktops to mobile devices (Dillon County Technology Center, 2013).

Web Page Design I is designed to provide graduates with the knowledge and skills needed to design web pages. Graduates will develop skills in designing, implementing, and maintaining a Web site using authoring tools. Successful completion of this course will prepare the student to take industry certification test(s) (Dillon County Technology Center, 2013).

Digital Desktop Publishing brings together graphics and text to create professional level publications. Graduates create, format, illustrate, design, edit/revise, and print publications. Improved productivity of digitally produced newsletters, flyers,

brochures, reports, advertising materials, and other publications is emphasized. Proofreading, document composition, and communication competencies are also included. Also available are Digital Multimedia and Digital Input Technologies (Dillon County Technology Center, 2013).

The Cosmetology program is equivalent to programs offered by private cosmetology schools or colleges. Graduates are expected to complete 1,500 hours of instruction as required by the South Carolina Licensing Department in order to qualify for the Stated Board licensing examination (Dillon County Technology Center, 2013).

First Semester Cosmetology I offers instruction in theory and practical application of nail care and nail enhancement. Team building is also developed in the class setting. Records of attendance and hours are maintained as graduates begin preparation for Cosmetology 2 (Dillon County Technology Center, 2013).

Cosmetology II is designed to prepare the student to qualify for the state cosmetology licensing examination. The student receives training in the art and science of the care and beautification of hair, skin, and nails. The course of study includes scalp treatments, hair shaping, hair styling, setting, waving, hair coloring, and shampoos and rinses. Care of skin and nails includes manicuring and pedicuring, massage, facials, makeup application, and hair removal. Instruction in chemistry, bacteriology, and anatomy and physiology of the face, head, arms, and hands is incorporated by means of theory and of practical application on both mannequins and live models. Also included in the course of study is salon planning and management (Dillon County Technology Center, 2013).

First Semester Introduction to Culinary Arts provides an opportunity for graduates with little or no prior foods preparation experience, but with an interest in food, to learn about culinary skills. This basic course introduces graduates to the world of professional cooking. Training in safety and sanitation (ServSafe), kitchen basics and food service equipment, nutrition, and breakfast foods and sandwiches are taught in this beginning course. Lab experiences are provided throughout the semester in order to reinforce these skills (Dillon County Technology Center, 2013). The ProStart® Program is a two-year industry-based program that prepares graduates for careers in the restaurant and foodservice industry. Integration of the Family and Consumer Sciences student organization, Family Careers, and Community Leaders of America (FCCLA), greatly enhance this curriculum. This class will prepare culinary graduates for their first experience with working in a food service situation. This class can be accompanied with 'after school' paid employment in a food service establishment and is completed with the administration of the National ProStart I exam (Dillon County Technology Center, 2013).

Culinary Arts I builds on the basic skills provided in the year 1 course. Graduates will hone knife skills, basic cooking skills, menu design skills, and the practical math skills learned in the first year. Additional studies include cutting and preparation of meats, fish, poultry, and soups, stocks, and sauces; bread and pastry production; plating techniques; quality food preparation; and preparation of pasta, rice, potatoes, and dumplings. Other studies are available in accounting, terminology, French terminology, table-service, purchasing, global cuisine, and communicating with customers. Problem solving, time management, multi-tasking, mentoring, supervisory

skills, and professionalism are stressed in the second year of the program. This class can be accompanied with ‘after school’ paid employment in a food service establishment and is completed with the administration of the National ProStart 2 exam (Dillon County Technology Center, 2013).

Introduction to Culinary Arts aids graduates in completing a 400-hour paid internship and meets the testing requirements of the National Restaurant Association will receive national ProStart certification. This class is accompanied with paid employment in a food service establishment. Graduates must provide transportation to and from job sites. Possible employment includes jobs in Hospitality and Tourism as a Chef, Dinner cook, Travel Agent, Waiter, Waitress, or Restaurant Manager (Dillon County Technology Center, 2013).

Introduction to Graphic Communications teaches the basic technical knowledge and skills required to enter the field of Graphic Arts and Commercial Printing. Graduates learn about layout, composition, typesetting, and process photography. Offset printing, screen printing, and photography are covered in this class. Strong math and verbal skills are a must (Dillon County Technology Center, 2013).

Graphics I course prepares graduates to perform graphic communication tasks. Layout, composition, typesetting, process photography, plate making, offset production, textile screen printing, and photography (Dillon County Technology Center, 2013).

Graphic Communications II graduates learn about the exciting printing industry with emphasis on off-set printing. They gain experience by creating printing products. Creative thinkers enjoy a high-energy career in a fast-growing industry. Career Pathways include Arts, A/V Technology & Communications, Printing Press Operator,

Graphic Designer, Art Director, or Photograph Processing Worker (Dillon County Technology Center, 2013).

Introduction to Health Science includes an overview of therapeutic, diagnostic, health informatics, support services, and biotechnology research and development pathways in the health science career cluster. The course focuses on health careers exploration, healthcare systems, leadership, employability, and communication skills. Graduates will develop a concept of health maintenance practices, safety, teamwork, and legal and ethical responsibilities. Work-based learning experiences may be implemented in this course (Dillon County Technology Center, 2013).

Health Care Assisting is a course focusing on nursing assistant skills. Topics include hand washing, bed making, abbreviations, vital signs, standard precautions, communication skills, and documentation skills. After sixty hours of classroom and lab instruction and practice, graduates are required to complete forty hours of clinical instruction at a skilled care facility nearby. After successful completion of the 100-hour course, graduates can apply to take the state CNA certification exam (Dillon County Technology Center, 2013).

Emergency Medical Services or EMS is the second in a sequence of courses. Emergency Medical Services I is designed to teach graduates how to recognize and respond to various emergencies. Graduates learn basic anatomy and physiology as it relates to injury management and treatment. They are provided with the knowledge and skills necessary to recognize and care for emergencies in adults, children, and infants until professional medical help arrives. Graduates will obtain CPR/AED certification and are required to perform light physical activity (Dillon County Technology Center, 2013).

Industrial Manufacturing Tech I is an introduction course designed to orientate and enforce the importance of developing a safety conscious mentality to recognize and implement industry standard risk assessments that will allow safe and efficient manufacturing work to be accomplished. This training matrix is being introduced using the NCCER Core Curriculum while simultaneously exposing the graduates to basic welding and oxyfuel cutting and heating processes. This will help the graduates to gain skills and constantly reinforce safety to fortify safe habits around the equipment in the shop environment. Projects are designed to orient graduates into the manufacturing design process while encouraging teamwork and developing confidence (Dillon County Technology Center, 2013).

Industrial Manufacturing Tech II - Hand and Power Tool Operations exposure will advance the graduates to the next level needed to integrate more manufacturing processes and to be able to safely and successfully design, measure, layout, construct, and fabricate. This phase enhances graduates to become more acclimated to the industry's expected evolving safety conscience mentality and workmanship attributes. Instruction of skill sets continue with the utilization of welding design, layout and fabrication of various community projects to heighten student growth and to provide ample time to develop and internalize work-based skills (Dillon County Technology Center, 2013).

Industrial Manufacturing Tech III - Machining Operations reinforces safety and the combining of hand and power tools while integrating fundamental machining to further the manufacturing processes. Graduates advance to a skill level that enables graduates to practice and expand on the ability to construct materials safely to industry

standards and to begin to add components to their community project. Instruction will ultimately incorporate electrical, machined, and hydraulic/pneumatic components (Dillon County Technology Center, 2013).

Industrial Manufacturing Tech IV - Electrical, Hydraulic & Pneumatic Systems is the final phase of preparing graduates for entry level apprenticeship status. This class will advance all the previous courses to an employable level and will cultivate graduates obtaining National Accreditations. This course will allow completer graduates to pretest of several articulation agreements and possibly exempt some basic entry level courses on the post-secondary technical college courses in most NCCER recognized trade areas. Most graduates continue education at our local technical college, either merging into Industrial Maintenance, Machine Tool, or welding (Dillon County Technology Center, 2013).

Information Systems - Computer Programming I & II are designed to emphasize the fundamentals of computer programming. Topics include computer software, program design and development, and practical experience in programming, using modern, object-oriented languages (Dillon County Technology Center, 2013).

Computer Service Technology I & II are designed to prepare the student to perform entry-level tasks under the supervision of an experienced technician. Graduates receive instruction in safety, communication skills, leadership skills, human relations and employability skills, and effective work practices as well as in the installation, operation, maintenance, and repair of personal computers. Associated peripheral equipment and data cabling construction and installation are also included. Laboratory activities provide instruction in installation, component replacement,

operating systems, and upgrades in accordance with Comp TIA A+ certification standards (Dillon County Technology Center, 2013).

Masonry I is an instructional program designed to encourage graduates to understand the history of masonry. Graduates will be able to identify commonly used power tools of the construction trade, use power tools safely, and explain how to maintain power tools properly (Dillon County Technology Center, 2013).

Masonry II offers instruction in mixing mortar, setting up a work station, and safety using scaffold, laying various sizes of blocks and brick to the line or corner. Graduates will benefit from instructions in constructing and repairing walls, partitions, arches, fireplaces, floors, and walks (Dillon County Technology Center, 2013).

Masonry III graduates will recognize and identify basic blueprint terms, components, and symbols; relate information on blueprints to actual locations on the print; recognize different classifications of drawings; and interpret and use drawing dimensions (Dillon County Technology Center, 2013).

APPENDIX B: COURSES OFFERED AT

SOUTH CAROLINA CAREER CENTERS

NORTH CAROLINA DEPARTMENT OF PUBLIC INSTRUCTION

2014 CONCENTRATOR FEEDBACK SURVEY

Personal Data (required for all students)

- O This student is currently still in high school.
- O This student was not a concentrator (did not earn four technical credits in a pathway, at least one of which was at the second level, prior to graduating or leaving school)
- O This former student is in the military on active duty status and is not available for a personal interview.
- O This former student is currently incarcerated.
- O This former student is deceased.
- O None of the above is true.

(For students who responded A, B, C D, or E, no further survey is required. For students who responded F, continue.)

Questions 1-3 and 9 are required for all students

*1 Are you currently a member of the armed forces on active duty status?
- O Yes
- O No

*2 What is your current postsecondary education/advanced training status?
- O Four-year college or university
- O Community college
- O Other postsecondary institution
- O NC Department of Labor Registered Apprenticeship
- O Not currently in postsecondary education or advanced training

*3 What is your current employment status?
- O Not employed, seeking full or part time work
- O Not employed, not seeking work
- O Employed full time
- O Employed part time

4 **(For students who graduated)**
How strongly do you agree with the following statement:
Career and Technical Education was one important reason I stayed in school.
- O Strongly agree
- O Agree
- O Neither agree nore disagree
- O Disagree
- O Strongly disagree

5. **(For students who earned a credential)**
Earning a credential helped me gain a job, internship or work experience.
- O Strongly Agree
- O Agree
- O Neither agree nor disagree
- O Disagree
- O Strongly disagree

6. **(For students who earned a credential and responded to Item #3 with C or D)**
   How strongly do you agree with the following statement:
   Earning a credential helped me earn a better paying job.
   - o Strongly Agree
   - o Agree
   - o Neither agree nor disagree
   - o Disagree
   - o Strongly disagree

7. (**For students who earned a credential and responded to Item #2 with A, B, C or D)**
   How strongly do you agree with the following statement:
   Earning a credential helped me in my further studies or advanced training.
   - O Strongly Agree
   - O Agree
   - O Neither agree nor disagree
   - O Disagree
   - O Strongly disagree

8. **(For students who were enrolled in a course eligible for articulated credit or in a community college course)**
   How strongly do you agree with the following statement:
   Ability to earn postsecondary credit helped me make decisions about my educational path.
   - O Strongly Agree
   - O Agree
   - O Neither agree nor disagree
   - O Disagree
   - O Strongly disagree

9. Did you belong to a Career and Technical Education Student Organization in high school (FFA, FBLA, DECA, FCCLA, TSA, SkillsUSA, or HOSA).
   - O Yes
   - O No

10. **(For students who responded "Yes" to Item #9)**
    How strongly do you agree with the following statement:
    Belonging to a Career and Technical Education Student Organization in high school helped prepare me for further education or employment.
    - O Strongly Agree
    - O Agree
    - O Neither agree nor disagree
    - O Disagree
    - O Strongly disagree

SPACE FOR INTERVIEWER TO ADD NOTES

APPENDIX C: QUESTIONNAIRE FOR GRADUATES OF CAREER CENTER

ADAPTED FOR CAREER CENTER TEACHERS

Directions: Each survey participant will indicate their perception of trade and industrial education by answering the questions below. Select one of the five choices listed for each question 3-9.

1. What Career & Technical courses do you teach?

2. How many years of industrial experience do you have?

3. As a teacher of CTE how strongly do you agree with the statement that experience in the workforce better qualifies an instructor to teach trade and industrial courses?

    - Strongly Agree
    - Agree
    - Neither agree nor disagree
    - Disagree
    - Strongly Disagree

4. How strongly do you agree with the following statement that CTE Education allows graduates to be more connected with their career goals thus keeping them in school?

    - Strongly Agree
    - Agree
    - Neither agree nor disagree
    - Disagree
    - Strongly Disagree

5. How strongly do you agree with the following statement? Earning a credential helps graduates obtain an internship, work experience, or gain a job.

    - Strongly Agree
    - Agree
    - Neither agree nor disagree
    - Disagree
    - Strongly Disagree

6. How strongly do you agree with the following statement? Earning a credential helps graduates earn a better paying job.

    - Strongly Agree
    - Agree
    - Neither agree nor disagree
    - Disagree
    - Strongly Disagree

7. As a teacher, how strongly do you agree with the following statement that earning a credential helps graduates in further studies or advanced training?

    - Strongly Agree
    - Agree
    - Neither agree nor disagree
    - Disagree
    - Strongly Disagree

8. How strongly do you agree with the following statement? The ability to earn a post-secondary credit helps graduates make decisions about their educational path?

    - Strongly Agree
    - Agree
    - Neither agree nor disagree
    - Disagree
    - Strongly Disagree

9. How strongly do you agree with the following statement? Belonging to a Career-Technical Student Organization (CTSO) better prepares a student for employment or further education.

    - Strongly Agree
    - Agree
    - Neither agree nor disagree
    - Disagree
    - Strongly Disagree

Directions: Be concise as possible in relating your answer to your teaching experience.

10. As a teacher in the nontraditional setting, in your opinion, what are some of the benefits that nontraditional hands-on instruction affords students versus traditional classroom instruction?

APPENDIX D: QUESTIONNAIRE FOR CAREER CENTER TEACHERS

ADAPTED FOR BUSINESS PROFESSIONALS

Directions: Each survey participant will indicate their perception of trade and industrial education by answering the questions below. Select one of the five choices listed for each question 4-9.

1. What is your business type—Industry, Retail, Agriculture, Manufacturing, Customer Service, Proprietorship, or other? If other, please describe here.

2. Do you think the certification received at the Robeson County Career Center provides adequate skills to meet your company's needs? Please explain.

3. Do you find it necessary to provide additional training for employed credentialed CTE graduates? Please explain.

4.
5. How strongly do you agree with the following statement that CTE Education allows graduates to be more connected with their career goals thus keeping them in school?

    - Strongly Agree
    - Agree
    - Neither agree nor disagree
    - Disagree
    - Strongly Disagree

6. How strongly do you agree with the following statement? Earning a credential helps graduates obtain an internship, work experience, or gain a job.

    - Strongly Agree
    - Agree
    - Neither agree nor disagree
    - Disagree
    - Strongly Disagree

7. How strongly do you agree with the following statement? Earning a credential helps graduates earn a better paying job.

    - Strongly Agree
    - Agree
    - Neither agree nor disagree
    - Disagree
    - Strongly Disagree

8. As an employer how strongly do you agree with the following statement? Earning a credential helps graduates in further studies or advanced training.

    - Strongly Agree
    - Agree
    - Neither agree nor disagree
    - Disagree
    - Strongly Disagree

9. How strongly do you agree with the following statement? The ability to earn a post-secondary credit helps graduates make an informed decision about their educational path.

    - Strongly Agree
    - Agree
    - Neither agree nor disagree
    - Disagree
    - Strongly Disagree

10. How strongly do you agree with the following statement? Belonging to a Career-Technical Student Organization (CTSO) better prepares a student for employment or further education.

    - Strongly Agree
    - Agree
    - Neither agree nor disagree
    - Disagree
    - Strongly Disagree

Directions: Be concise as possible in relating your answer to your business experience.

11. In your professional opinion, do trade and industrial courses better prepare students to apply critical thinking and problem solving skills? Please explain.

APPENDIX E: LETTER TO VALIDATION COMMITTEE

January 25, 2016

Greetings,

My name is Elizabeth J. King and I am a doctoral student at East Carolina University. I have recently completed my pre-proposal defense and gained approval from my chairperson, Dr. Marjorie Ringler and Department Chair, Dr. Art Rouse as well as the other committee members to move forward with my dissertation titled, *A Study of the Perceptions of the Effectiveness of Trade and Industrial Education in the Preparation of Graduates for Employability and Post-Secondary Education.*

As part of my study, I am utilizing a survey instrument based on the North Carolina Department of Public Instruction's Concentrator Feedback Survey. This survey is given to graduates of the public schools ten months after graduation to obtain their post-secondary education and employment status. The survey will also secure the graduates' perception concerning the impact of Career-Technical coursework on preparing them for employment and post-secondary education. As part of my study, I need to establish the construct validity of this survey before I give the survey to trade and industrial teachers and business professionals. I am requesting your help because of your expertise in business and industry.

Your assistance is needed as follows:

Please read the survey attached and answer the following questions about the survey:

1. Are the questions a good measure of the practices associated with the NCDPI Concentrator Feedback Survey that was created for public school graduates?

2. In your opinion, can the questions in this survey be used for trade and industrial teachers and business professionals to understand their perceptions of the value of Career-Technical education in relation to its impact on graduate readiness for the employment and post-secondary education?

The entire survey is attached, which includes some demographic information. If you would kindly review and respond to me by Friday, January 29th, it would be greatly appreciated.

Sincerely,

Elizabeth J. King
ECU Doctorate Student

APPENDIX F: VALIDATION COMMITTEE CONFIRMATION FORM

Validation Committee Response to Survey Questions:

1. Are the questions a good measure of the practices associated with those defined by the survey questions created by NCDPI for public school graduates?

2. In your opinion, can the questions in this survey be used for trade and industry teachers and business professionals to understand their perceptions of the value of Career-Technical education in relation to its impact on graduate readiness for the employment and post-secondary education?

With my signature below, I am recommending the following revision of the Teacher and Business Surveys:

_____
_____
_____
_____
_____
_____

Signature of Validation Committee Member Date

APPENDIX G: CAREER-TECHNICAL EDUCATION CREDENTIALS

TRADE AND INDUSTRIAL CREDENTIALS

Program Area	Course Number	Course Name	Credential Info
Trade and Industrial	IA32	Advanced Digital Media	Adobe Photoshop, In Design, Illustrator, Adobe Dreamweaver, Adobe Premier
Trade and Industrial	II31	Adobe Visual Design	Adobe Photoshop, In Design, Illustrator
Trade and Industrial	II32	Adobe Digital Design	Adobe Dreamweaver
Trade and Industrial	IT11	Introduction to Automotive Service	S/P2
Trade and Industrial	IT18	Automotive Service III	ASE G1 - MLR
Trade and Industrial	IM41	Metals Manufacturing I	NIMS Measurement, Materials and Safety, NIMS Job Planning, Benchmark, and Layout
Trade and Industrial	IM41	Metals Manufacturing II (two credit course)	NC Manufacturing Certificate, NIMS Manual Milling Skills, NIMS Job Planning, Benchmark, and Layout, NIMS Measurement, Materials, and Safety
Trade and Industrial	IM61	Welding Technology I	OSHA 10-Hour Industry Certification
Trade and Industrial	IM62	Welding Technology II	SMAW and/or GMAW & 10-Hour Industry Certification
Trade and Industrial	IC00	Core and Sustainable Construction	NCCER Credential & OSHA 10-Hour Construction Industry Certification
Trade and Industrial	IC11	Masonry I	NCCER Credential & OSHA 10-Hour Construction Industry Certification

Program Area	Course Number	Course Name	Credential Info
Trade and Industrial	IC12	Masonry II	NCCER Credential & OSHA 10-Hour Construction Industry Certification
Trade and Industrial	IC21	Carpentry I	NCCER Credential & OSHA 10-Hour Construction Industry Certification
Trade and Industrial	IC22	Carpentry II	NCCER Credential & OSHA 10-Hour Construction Industry Certification
Trade and Industrial	IC41	Electrical Trades I	NCCER Credential & OSHA 10-Hour Construction Industry Certification
Trade and Industrial	IC42	Electrical Trades II	NCCER Credential & OSHA 10-Hour Construction Industry Certification
Trade and Industrial	IC61	Drafting I	Autodesk AutoCAD Certified User
Trade and Industrial	IC62	Drafting II - Architectural	Autodesk Revit Architectural Certified User
Trade and Industrial	IV22	Drafting II - Engineering	Autodesk Inventor Certified User or Certified Solid Works Associate (CSWA)
Trade and Industrial	II12	Network Engineering Technology II	CISCO CCENT
Trade and Industrial	II21	Computer Engineering Technology I	CompTIA A+ 801
Trade and Industrial	II22	Computer Engineering Technology II	CompTIA A+ 802

Program Area	Course Number	Course Name	Credential Info
Trade and Industrial	LL58	Plumbing I	NCCER Credential & OSHA 10-Hour Construction Industry Certification
Trade and Industrial	LL59	Plumbing II	NCCER Credential & OSHA 10-Hour Construction Industry Certification

APPENDIX H: INSTITUTIONAL REVIEW BOARD APPROVAL LETTER

EAST CAROLINA UNIVERSITY
University & Medical Center Institutional Review Board Office
4N-70 Brody Medical Sciences Building· Mail Stop 682
600 Moye Boulevard · Greenville, NC 27834
Office **252-744-2914** · Fax **252-744-2284** · **www.ecu.edu/irb**

Notification of Initial Approval: Expedited

From:	Social/Behavioral IRB
To:	Elizabeth King
CC:	Marjorie Ringler
Date:	6/3/2016
Re:	UMCIRB 16-000306 A Study of the Perceptions of the Effectiveness of Trade and Industrial Education

I am pleased to inform you that your Expedited Application was approved. Approval of the study and any consent form(s) is for the period of 6/2/2016 to 6/1/2017. The research study is eligible for review under expedited category # 5, 7. The Chairperson (or designee) deemed this study no more than minimal risk.

Changes to this approved research may not be initiated without UMCIRB review except when necessary to eliminate an apparent immediate hazard to the participant. All unanticipated problems involving risks to participants and others must be promptly reported to the UMCIRB. The investigator must submit a continuing review/closure application to the UMCIRB prior to the date of study expiration. The Investigator must adhere to all reporting requirements for this study.

Approved consent documents with the IRB approval date stamped on the document should be used to consent participants (consent documents with the IRB approval date stamp are found under the Documents tab in the study workspace).

The approval includes the following items:

Name	Description
A Study of the Perceptions of the Effectiveness of Trade and Industrial Education in the Preparation of Graduates for Employability and Post-secondary Education	Study Protocol or Grant Application
Consent Form March 2016	Dataset Use Approval/Permission
Survey Business Professional Consent Cover Letter	Consent Forms
Survey Teacher Consent Cover Letter	Consent Forms
Surveys Business Professionals Appendix D	Surveys and Questionnaires
Surveys NCDPI Concentrator Feedback Survey Appendix B	Surveys and Questionnaires
Surveys Teachers Appendix C	Surveys and Questionnaires

The Chairperson (or designee) does not have a potential for conflict of interest on this study.