

Summer 2012

## Components Needed for the Design of a Sustainable Career and Technical Education Program

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**COMPONENTS NEEDED FOR THE DESIGN OF A SUSTAINABLE  
CAREER AND TECHNICAL EDUCATION PROGRAM**

by

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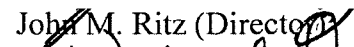
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Old Dominion University in Partial Fulfillment of the  
Requirements for the Degree of

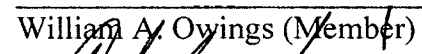
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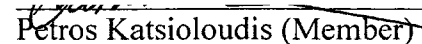
CONCENTRATION IN  
OCCUPATIONAL AND TECHNICAL STUDIES

OLD DOMINION UNIVERSITY  
August 2012

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**ABSTRACT**

**COMPONENTS NEEDED FOR THE DESIGN OF A SUSTAINABLE CAREER  
AND TECHNICAL EDUCATION PROGRAM**

Vann M. Lassiter  
Old Dominion University, 2012  
Director: Dr. John M. Ritz

As education has changed to meet the needs of society and has been shaped by the enactment of new laws, various aspects included under the massive umbrella of education have also changed to maintain momentum. One such educational program is career and technical education (CTE). Changes to CTE have been made to continually meet the needs of all involved. The purpose of this study was to identify components needed for the design of a sustainable career and technical education program. The study will provide readers with factors, which in turn will allow them to design programs which will meet the needs of education and business and industry. Information was gathered from 106 out of 115 (92.17%) career and technical education directors in North Carolina using survey research methods. Statistical analyses were used to determine the most significant factors involved in sustaining CTE programs.

Research Objective 1, to determine the factors that support the implementation of a career and technical education program, showed the most significant factors were teachers holding appropriate degrees and/or licenses for the courses taught ( $M=4.55$ ), technical assessments have been established and are used within the district ( $M=4.42$ ), a set sequence of rigorous courses that are relevant to the 16 national career clusters have been established ( $M=4.30$ ), and career and technical education student organizations were established and active ( $M=4.23$ ).

Research Objective 2, to determine factors that facilitate the growth of career and technical education programs, analyzed the most significant factors to be a district having a local and state articulation agreement with community colleges and/or universities for courses offered (M=4.40), collaboration with local community colleges and universities having been established (M=4.37), students have access to industry credentialing exams (M=4.33), and workforce readiness skills were identified and incorporated into career and technical education course offerings (M=4.24).

Research Objective 3, to determine factors necessary to sustain an effective career and technical education program, identified the most significant factors were instructors are provided opportunities for continued professional development (M=4.47) and teachers have the equipment and technology recommended to support teaching of career and technical education courses (M=4.36).

Based on this study, the researcher was able to provide benefits of an effective career and technical education program which could be used to justify the importance of such programs not just to students, but to all stakeholders involved. More specifically, the research provided this information in the form of factors necessary to design and sustain an effective career and technical education program.

## **DEDICATION**

This dissertation is dedicated to my grandfather, Willie Andrew Satterfield, who was always my role model, supporter, and number one fan. Although he has passed away and is unable to see me graduate with my Ph.D., I do write this dissertation, a symbol of my educational hard work and dedication, with love in remembrance of him – the individual who taught me the importance of family, living right with Christ, obtaining my education, and being determined to succeed. From him I learned to be willing to dream big, work hard, and never give up even against all odds.

Vann Mizzelle Lassiter

## ACKNOWLEDGEMENTS

It is with great pleasure that I acknowledge the individuals who have traveled with me along this journey in completing my dissertation, obtaining my degree, and graduating as Dr. Vann Mizzelle Lassiter. First and foremost, I give honor to my Lord and Savior, for without Him it would not have been possible. My life's motto is found in His Word – The Bible – in Philippians 4:13. It reads, “I can do all things through Christ which strengtheneth me.”

I would also like to thank my family for their love, encouragement, and most importantly, prayers. I could not have made it thus far without the support of my mom, Lois Lassiter, dad, Sidney Lassiter, sisters Sydney Denae' and Jordonn Lassiter, my grandmother, Lillian Satterfield, and the friends who listened and encouraged me throughout this process.

Lastly, I would like to extend many thanks to Dr. William A. Owing and Dr. Petros Katsioloudis who were members of my committee and to my mentor, advisor, and dissertation committee chair, Dr. John M. Ritz, for without his continued support I could not have made it through this process.

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## CHAPTER I

### INTRODUCTION

Career and technical education, known as vocational education or workforce education, has long had a role in the history of American education. As education has changed with the needs of society and the enactment of laws regarding educational reform, career and technical education has also sought to change to continually meet the needs of all involved. Drage (2009) explains, “High-quality career and technical education (CTE) programs can launch America’s future competitiveness through increased student engagement, the innovative integration of traditional academic courses, and by meeting the needs of both employers and the economy as a whole” (p. 32). This quality of education can only be achieved through the continued efforts of researchers and curriculum specialists to design effective programs. However, what components or factors create a sustainable program? The likelihood that an overall program can continuously regenerate itself in an ever-improving direction is important to consider (Fullan, 2002).

The factors one should consider in creating or designing an effective career and technical education program can stem from federal and state mandates. One of the pieces of legislation currently impacting the future of career and technical education is the Carl D. Perkins Career and Technical Education Improvement Act (2006). Its purpose was to “assist states to expand, improve, modernize, and develop quality vocational education programs” (Pautler, 1999, p. 40). According to Pautler (1999), “...the philosophy reflected in this act was that the local community is the best entity to administer vocational education programs” (p. 41). As Brown (2003) states, “CTE practitioners and

policy makers need similar data to ensure that their programs, curricula and allocation of resources are appropriately designed and targeted” (p. 3). The researcher provided such data through this study.

Economic issues faced by society have most recently affected career and technical education. Gentry (2003) states, “...recent changes have been precipitated by both economical and educational reform” (p. 48). In the current tough economic times many schools are looking at ways to “cut” or “reduce” unnecessary programs. Through this study the researcher provided readers with the benefits of an effective career and technical education program which could be used to justify the importance of such a program not just to students, but to all stakeholders involved. Halls (2009) explains, “This country has lost thousands of jobs offshore to countries that have taken advantage of the United States’ lack of support of CTE...developing vocational education is an important part of education undertaking” (p. 62). Brown (2003) supported this notion by stating, “High quality career and technical education (CTE) programs prepare students for occupations and careers in demand. CTE program planning involves use of up-to-date labor market information (LMI), which is provided by a variety of state, federal, and local agencies and organizations” (p. 3). For these reasons the following study was undertaken.

### **STATEMENT OF THE PROBLEM**

The problem of this study was to identify components needed for the design of a sustainable career and technical education program.

## **RESEARCH OBJECTIVES**

To guide this study the following research objectives were established:

RO<sub>1</sub>: Determine the factors that support the implementation of a career and technical education program.

RO<sub>2</sub>: Determine factors that facilitate the growth of career and technical education programs.

RO<sub>3</sub>: Determine factors necessary to sustain an effective career and technical education program.

## **BACKGROUND AND SIGNIFICANCE**

The decision to identify components needed to design a sustainable career and technical education program, one that can endure economic times and continuously regenerate itself in an ever-improving direction, was the result of discussions of career and technical education directors in North Carolina and readings that were seeking ways to maintain and grow current programs (Fullan, 2002). Readings have addressed the newest types of technology to include in curriculum, initiatives used to develop workplace readiness skills, the benefits of career and technical education co-curricular student organizations, as well as initiatives to help with dropout prevention. However, how does one who is designing a career and technical education program know where to begin or what to include? Which components currently addressed by researchers are most important in the success of a program? Which help in program growth?

Education is constantly developing new ideas or initiatives and not necessarily evaluating the effectiveness of current ones. De Vore (2009) states, "Efforts to revive career and technical education, although well-intended, have produced limited results.

America is in the midst of a global competition and a number of reports suggest we are losing ground in career and technical education” (p. 1). In February 2005, Bill Gates explained to governors, business, and education leaders that education is changing and if not updated will become outdated. Gates (2005) stated:

American high schools are obsolete. By obsolete, I mean that our high schools, even when they are working exactly as designed, cannot teach our kids what they need to know today. Training the workforce of tomorrow with high schools today is like trying to teach kids about today’s computers on a 50 year-old mainframe.

It’s the wrong tool for the times. (p. 1)

Not addressing this issue could be catastrophic for career and technical education.

Outdated curriculum or initiatives and out-of-touch schools may be failing all stakeholders involved. De Vore (2009) further states, the key to addressing this problem “...is an understanding of the forces that are driving the need for change, clarifying what’s working and what’s not working within current high school programs, identifying the key stakeholders to lead reform efforts, and developing a shared mission” (p. 1). In addition, in the wake of financial constraints, many educational institutions are looking for ways to “cut back” – limiting positions, programs, or not upgrading necessary equipment or purchasing the most recent materials. As Brown (2003) states, “...recent reform efforts focused on increasing graduation requirements have in turn led to the elimination of elective courses such as CTE in the secondary curriculum” (p. 32). As Matthews-Cook (2009) explains, “The world that schools serve is characterized by growing social and economic instability” (p. 3). It is the hope of the researcher to provide information to help current programs grow, future programs succeed, and serve

as a resource for school personnel and legislators to support future legislation and policies to include career and technical education as it provides value to all stakeholders. De Vore (2009) argues, "...the way that vocational education is perceived is a very critical factor in the establishment and success of a high school vocational education program. If the stakeholders do not view vocational education in a positive light, there is a chance that they will not support or take part in it, financially or otherwise" (p. 12). Gentry (2005) states "...CTE has not been immune from the scrutiny of educational reform movements, with recent cuts to funding in this area just one indication of waning support" (p. 48).

Knowing the factors needed to design a sustainable career and technical education program is significant for several reasons. First and foremost, federal and state laws mandate career and technical education maintain and follow a certain set of standards. These standards are provided in such legislation as No Child Left Behind and the Carl D. Perkins Career and Technical Education Improvement Act (2006). Gentry (2005) states, "...efforts to leave no child behind should include CTE as part of the continuum of educational service" (p. 47). In fact, the Carl D. Perkins Act (2006) indicated that "...states, school districts and postsecondary institutions have a new opportunity for true innovation and reform within CTE" to meet the needs of all involved (Hyslop, 2009, p. 40).

The United States Department of Education explains that the Carl D. Perkins Career and Technical Education Improvement Act (2006) "...will provide an increased focus on the academic achievement of career and technical education students, strengthen the connections between secondary and postsecondary education, and improve state and

local accountability” (United States Department of Education, 2009, para. 1). However, how does a career and technical education program strengthen academic achievement of students? Does this really add value to the problem? How do students benefit? Are effective career and technical education programs at the secondary level strongly linked to postsecondary institutions? If so, how is this done effectively? According to Gordon (2007), “...CTE needs to complement NCLB and be aligned with it because of the dynamics between the economic environment, global competition and the influx of technology into the workplace” (p. 121). As NCLB is legislation, CTE is not immune from the provisions of the Act. Besides, CTE programs in the United States exist because of federal legislation.

Career and technical education programs prepare students beyond secondary schooling. It provides benefits for all stakeholders. However, what are the benefits of an effective career and technical education program? Not all schools are successful in providing industry with potential employees. According to Gordon (2007), “...in addition to considering economic and labor market needs, the context for federal investment in CTE, particularly with regard to secondary education, is also influenced by the poor performance of many high schools” (pp. 121-122). Accordingly, this problem at the secondary level has been chronicled by reports, such as *Changing an American Institution* by the National Association of Secondary School Principals (1999), *High Schools* by the Millennium of the American Youth Policy Forum (2000), and *Raising Over Sights: No High School Senior Left Behind* by the National Commission on the High School Senior Year (2001) (Gordon, 2007). Matthews-Cook (2009) states, “...while the present focus of academic proficiency, career and technical education

programs have felt the pressure to keep pace with increasing academic and technical skill demands, greater demands are being placed on the educational system to produce a workforce that is capable of operating in new and different situations” (p. 15).

By addressing this problem, this study becomes significant in the designing of career and technical education programs. This study provided readers with factors that contribute to a sustainable career and technical education program, which in turn allows educators to design programs which will meet the needs of all involved.

### **LIMITATIONS**

This study relied on a survey distributed to North Carolina career and technical education directors during fall 2011, specifically December and January. This study was limited due to the following conditions:

1. Because survey responses only depict opinions of career and technical education directors, perceptions relating to the factors which are effective in sustaining and developing a career and technical education program may differ among teachers, administrators, and other stakeholders.
2. Because this study was completed in North Carolina, one does not know if career and technical education programs in other states would yield similar results.
3. Conceptually, career and technical education has various meanings based on one's program. Thus career and technical education has been defined in this study as vocational education or workforce development education and includes programs of study such as agricultural education, business and information technology, career development, family and consumer science, health



occupations, marketing, technology, or trade and industrial education (Career and Technical Education, 2009).

4. Theoretically, the concept of sustainability has various meanings. Thus sustainability has been defined in this study as the ability of a program, specifically a career and technical education program, to endure or continue operation. Sustainability is the likelihood of a program to continuously regenerate itself in an ever-improving direction (Fullan, 2002).

### **ASSUMPTIONS**

When conducting research, certain information must be assumed. The following assumptions were made in this research study:

1. Stakeholders – students, parents, business and industry, and society – would benefit from a sustainable career and technical education program.
2. Program characteristics and components identified by respondents as essential in the sustainability of career and technical education programs would be instrumental in the design process of new and existing career and technical education program development for North Carolina and other states.

### **PROCEDURES**

The method of data collection used for this research project was a survey containing both open-form and closed-form questions. Surveys would be completed by current career and technical education directors in North Carolina. There were directors divided among eight educational regions including Northeast, Southeast, North Central, South Central, Central, Northwest, Southwest, and Western. Education districts are drawn by the General Assembly. The research study was discussed with the State Career

and Technical Education Director, who also participated during the pilot study along with the state program career and technical education directors. Directors' names and contact information were obtained from the Internet. The researcher located school district directors from school district websites.

There were thirty-six questions in the survey. Some of the closed-form questions were Likert questions. The instrument questions were designed and developed from the research goals and professional literature to seek the answer to the researcher's problem under study.

After development, the survey was pilot tested for validity with content experts and tested a second time for reliability with a group of career and technical education directors from the North Carolina Department of Public Instruction. The survey was then revised and administered to career and technical education directors in North Carolina during the fall of the 2011-2012 academic school year. Surveys were administered via e-mail that had a link. Follow-up e-mails with the link were sent to those who had not participated within two weeks of the original survey, followed by personal phone calls to encourage participation. The responses were analyzed and results used in discussions about the effectiveness of career and technical education programs and the components necessary to prepare students for the future and to compete globally.

### **DEFINITION OF TERMS**

The following terms were used in this report.

1. *Career and Technical Education (CTE)* – Also known as vocational education or workforce development education and includes programs of study such as agricultural education, business and information technology, career development,

family and consumer science, health occupations, marketing, technology, or trade and industrial education (Career and Technical Education, 2009). Programs include competency-based applied learning which contributes to an individual's academic knowledge, higher-order reasoning, problem solving skills, and the occupational-specific skills necessary for economic independence as a productive and contributing member of society (U.S. Department of Education, 2002).

2. *Factor* – An independent variable (Hinkle, 2003). Any entity that can take on different values (Trochim, 2006).
3. *Labor Market Information (LMI)* – Also called workforce or career information; includes information about labor market conditions, employment trends, earnings in occupations, skill requirements, and education and training resources (Brown, 2003).
4. *Sustainability* – The ability of a program to endure, last, and continuously regenerate itself in an ever-improving direction (Fullan, 2002).

## **OVERVIEW OF CHAPTERS**

Chapter I introduces the reader to the problem of this study – to identify components needed to design a sustainable career and technical education program – and outlined the goals and procedures to conduct such research. Through the use of a survey, the researcher determined factors of an effective career and technical education program, factors that facilitate the growth of career and technical education programs, and factors necessary to sustain an effective career and technical education program.

This study was conducted by having career and technical education directors in North Carolina complete a survey. The researcher located names and e-mail addresses

from district websites. Results were then analyzed. Like most research, limitations and assumptions were present. It was the assumption of the researcher that stakeholders – students, parents, business and industry, and society – would benefit from a sustainable career and technical education program and program characteristics and components identified by respondents as essential in the sustainability of career and technical education programs would be instrumental in the design process of new and existing career and technical education program development for North Carolina and other states.

This study was limited because survey responses only depict opinions of career and technical education directors; perceptions relating to the factors which are effective in sustaining and developing a career and technical education program may differ among teachers, administrators, and other stakeholders. One does not know if all career and technical education programs in other states would yield similar results. Conceptually, career and technical education and the term sustainability have various meanings based on one's program.

Chapter II explores the evolution and importance of career and technical education in the United States, explains career and technical education programs in North Carolina, defines sustainability, examines the benefits afforded stakeholders involved with an effective career and technical education program, identifies factors that facilitate career and technical education program growth, and discusses the demands of career and technical education for the future.

Methods and procedures are addressed in Chapter III. This chapter explains the process of creating the questionnaire as well as the process of creating and selecting open- and closed-form questions to address the research goals and why North Carolina

Career and Technical Education Directors were selected to complete the questionnaire.

Results of this study are examined in detail in Chapter IV, providing the reader with information to illustrate the findings. Conclusions and future recommendation for North Carolina and other career and technical education programs within the United States are justified in Chapter V.

## **CHAPTER II**

### **REVIEW OF LITERATURE**

Education has changed with the needs of society and the enactment of new laws. Career and technical education has sought to change as well to continually meet the needs of all involved. However, as change occurs it is essential to maintain a quality and effective career and technical education program in schools. The purpose of this study was to identify perceptions of components needed for the design of a sustainable career and technical education program. To provide readers greater understanding of the program, this chapter presents information pertaining to the following topics: evolution of career and technical education, reform and effective strategies used for growth, career and technical education in North Carolina, definition of sustainability, factors of educational sustainability, and a summary. Evaluation of these areas provides a simpler and more straightforward means of understanding the current and future intentions of career and technical education programs.

#### **EVOLUTION OF CAREER AND TECHNICAL EDUCATION**

Vocational education, today known as career and technical education, has existed since the beginning of time and has undergone changes over the years to meet the needs of society. In fact, its name change is proof of these changes. One individual stated, “Vocational education in the United States is the product of an extended evolutionary process” (Castro, 2007, para. 1). According to Scott (1996), “The evolution of vocational and applied technology can be traced from the Paleolithic period, through the Neolithic period, Agricultural Civilization, Bronze Age, Iron Age and Greek Civilization, Roman Civilization, Middle Ages, Renaissance and Reformation, and Industrial or Information

Age of today” (p. 47). Traditionally, career and technical education was in the form of apprenticeships.

Congressional support of vocational education emerged in 1862 with the passage of the Morrill Act, also known as the “Land Grant Act,” stressing the need for it in education and setting the stage for acceptance and providing support in the area of agriculture and mechanical arts. According to Pautler (1999), “...this legislation gave states land that could be sold or leased to raise money to establish at least one college for the purpose of offering a combination of liberal and practical education” (p. 35).

Early in the twentieth century, vocational education was a prominent topic of discussion among American educators as schools were struggling to meet the labor needs consistent with the shift from an agrarian to an industrial economic base. President Woodrow Wilson in 1914 appointed the Commission on National Aid to Vocational Education to study the public sentiment of an “urgent social and education need for vocational education, supporting the idea of federal aid to sustain vocational education leading to collaboration of federal, state, and local government” (Pautler, 1999, p. 11). Through this collaboration the Smith-Hughes Act of 1917 was born, helping to further define vocational education. The Oklahoma Department of Education explains, “The earliest federal definition from the Smith-Hughes Act of 1917 defined vocational education as the preparation for employment in positions requiring less than a baccalaureate degree” (A Selected Chronology, 2005). Through this act national support was gained, emphasis was placed on the needs of children of the working class for the first time in education, and funding for agriculture, trade and industry, and home economics were also appropriated (Gray, 1991). The beginning of major federal

influence began with this act created in response to social, economic, and political issues.

In 1936 the George-Dean Act was passed. Pautler (1999) stated, “It was a supplemental authorization which increased funds [and] broadened the scope of vocational education program areas eligible for annual appropriations to include distributive education [today known as marketing education]” (p. 37). This act was amended in 1956 to include practical nursing and was the first act where federal funds provided for increased funding and expanded the role of the federal government in vocational education. In fact, Pautler (1999) asserts, “Annual appropriations increased from \$1.5 million under the Smith-Hughes Act to over \$28 million” (p. 37). Contributing to this act was the fact that thousands of returning World War II veterans needed skills to function in society. Furthermore, as a result of this act “decision making control was given to state and local education agencies” (Pautler, 1999, p. 37). This was key as it loosened federal control over expenditures.

A significant time in history which also affected vocational and career and technical education was the response of Americans to the launching of the Russian satellite Sputnik I. This event led to the creation of the National Defense Education Act of 1958 which “...was the first act [to stress] the importance of science, mathematics, foreign language, and technical competencies in preparing individuals for the workforce” and led to the creation and funding of postsecondary area schools in each state and the establishment of vocational schools (Pautler, 1999, p. 38). The federal direction for career and technical education today is founded in school reform and achievement as evidenced by federal legislation.



In 1963, the Vocational Education Act, formally known as the Perkins-Morse Bill of 1963, was passed “signaling the initial total commitment of federal government to vocational education” and ultimately establishing that ninety percent of funds allocated were based on the population of each state which could be spent for vocational education for high school students, individuals who have completed or discontinued high school but are available to prepare for employment but need training, individuals already employed who need more training, and individuals who have socioeconomic or other handicaps (Pautler, 1999, p. 38). Ten percent must be spent on research and development, construction of vocational education schools for teacher training, and curriculum development (Pautler, 1999). This act proved essential to vocational education today.

Federal legislation by 1976 was beginning to address social issues such as the need of disabled and disadvantaged students through career and technical education. Other acts that followed included the Career Education Incentive Act of 1978, Comprehensive Employment and Training Act (CETA) Amendments of 1978, Department of Education Organization Act of 1979, and the Job Training Partnership Act of 1982. This trend continued until the 1980s. In 1983, with the introduction of the report *A Nation at Risk*, the focus of education turned toward the reform of schools. Career and technical education followed suit, joining the reform efforts and introducing one of the most popular pieces of legislation in vocational education history, the Carl D. Perkins Vocational Act of 1984, which has been amended over the years. Integration of academic and vocational high schools was promoted through this act (Gasbarre, 2007). Its purpose was to “assist states to expand, improve, modernize, and develop quality vocational education programs” (Pautler, 1999, p. 40). The premise behind this act was

to provide local communities the opportunity to administer vocational education programs. Key components of this act included state plans which have to be submitted annually, the mandate of a national assessment, the recruitment, enrollment, and placement activities that would provide handicapped and disadvantaged individuals a full range of vocational programs, creation of a State Council on Vocational Education, and an outline of how funds could be used (Pautler, 1999).

The Perkins Act had two interrelated goals – to provide equal opportunities for adults and improve the skills of the labor force (Castro, 2009). This act reflected the education policies and reform of the time. Addressing both social and economical issues in society, this act was amended in 1990 and again in 2006 which authorized the largest amount of money ever funded for vocational education. The Perkins Act is authorized through 2012. With the update of the Perkins Act in 2006 came new items including definitions and other provisions, each relevant in its own way, which have also provided the foundation for the future of career and technical education. The 2006 Perkins Act also set accountability indicators which have fueled the future of career and technical education reform. The secondary accountability indicators included: (1) academic achievement on No Child Left Behind (NCLB) assessments, (2) technical attainment – industry standards when possible, (3) attainment of a diploma, GED, or a proficiency credential in conjunction with a diploma, (4) NCLB graduation rates, (5) placement in postsecondary, military, or employment, and (6) participation and completion of non-traditional programs (Brustein, 2006). Post-secondary accountability indicators included (1) technical attainment – industry standards when possible, (2) attainment of industry recognized credential, certificate, or degree, (3) retention in postsecondary (including

transfers to 4-year colleges or universities), (4) placement in military or apprenticeship, or placement or retention in employment – including high skill, high wage, or high demand, and (5) participation and completion of non-traditional programs (Brustein, 2006).

Career and technical education has also been an advocate for providing services to students with special needs through such legislation as the Individuals with Disabilities Education Act (IDEA) and the Rehabilitation Act; subsequent acts have also addressed this topic including No Child Left Behind and the Perkins Act. According to Sarkees-Wircenski (2004), the Special Needs Division of Association of Career Technical Education explains that career and technical education, special education teachers, teacher educators, and administrators are dedicated in helping all students succeed. Students with special needs typically face such challenges as academic and/or economic disadvantages, disabilities, limited English proficiency, current or past incarceration, long-term unemployment or underemployment, teenage pregnancy, lack of education, or are nontraditional students (Sarkees-Wircenski, 2004). It is, therefore, through career and technical education that they can develop workplace skills to advance themselves. The Rehabilitation Act established in 1973 was amended in 1984. This amendment authorized demonstration projects to address problems encountered by students with disabilities in making the transition from school to work (Sarkees-Wircenski, 2004). There were subsequent pieces of legislation as well to help in addressing the issues of educating all students, including those with disabilities. Some included the amendments to the Rehabilitation Act in 1986, Handicapped Children's Protection Act of 1986,

American with Disabilities Act of 1990, and the Technology-Related Assistance for Individuals with Disabilities Act Amendments in 1994, among others.

Through the evolution of career and technical education and the introduction of various pieces of legislation, it has been the goal of career and technical education to prepare all students for their futures. This has ultimately impacted business and industry. According to Sarkees-Wircenski (2004), from the passage of the Smith-Hughes Act to the Carl D. Perkins Act and the Workforce Investment Act, "...Congress has attempted to solve some of the nation's most pressing social, political, and economic problems by enacting workforce legislation to assist states and local educational and training agencies as they design and implement programs that prepare individuals for meaningful, productive employment" (p. 282). Although it is difficult to predict what changes will be made in federal support of career and technical education, it is important that continued support is provided.

### **REFORM AND EFFECTIVE STRATEGIES FOR PROGRAM GROWTH**

As career and technical education changes, curriculum in the United States is also changing and adapting to the needs of students, community, and society. These future projections of the profession are based on research and literature documented by the field. Infusing career and technical education with academic knowledge can provide the kind of flexibility desired in the twenty-first century worker (Lynch, Smith, & Rojewski, 1994). As Kendall (2006) expresses, "...career education is not emphasized enough" (p. 13). He elaborates by stating, "...integrating CTE into all disciplines and education levels can support improved student achievement overall by making what students are learning in their academic subjects relevant to the world of work" (p. 15).

The Career Clusters initiative is a career-focused project to prepare students for the changing economy. Career Clusters can be defined as a grouping of occupations and broad industries based on commonalities and are seen as “an organizing tool for curriculum design and instruction based on common knowledge and skills shared by groups of occupations and career specialties” (NC Career Clusters, 2009, p. 132). Pathways, on the other hand, in the context of Career and Technical Education, are a “subgroup of one of the 16 Career Clusters...at the pathway level, knowledge and skill requirements are targeted toward a very specific group of occupations that share common abilities” (NC Career Clusters, 2009, p. 131). Career Clusters began to materialize and develop to support workforce preparation, economic development, and educational reform; Career Clusters were developed to ensure both academic and technical rigor, as well as preparation for careers and not just jobs which supports the new vision and direction of CTE.

Career Clusters were developed for several reasons. Some were included to meet the needs of learners in today’s changing and demanding job market; they reflect higher stakes academic standards required for learners to be successful as they transition from one educational level to the next and also support the idea of more rigorous standards for career and technical education students (The 16 Career Clusters, 2010). As a result of the clusters, partnerships have been developed among states, secondary and postsecondary schools, and employers. This allows for more integration and curriculum discussion, providing students with more relevant and meaningful curriculum activities and standards (The 16 Career Clusters, 2010). There are 16 career clusters and 81 total pathways dispersed among the clusters.

Career academies serve as another strategy to aid career and technical education programs in program growth. Career academies are set up as a “school-within-a-school” with curricula that combine academic and career knowledgeable skills and which help in providing jobs, internships, field trips, classroom speakers, and mentors in the field (Sarkees-Wircenski, 2004). Career academies are beneficial, according to Sarkees-Wircenski (2004), because “...they are structured to allow students to complete required academic subjects for admission to higher education while demonstrating the relevance of academic subjects to an occupational field” (p. 19). Based on *Overview of Career and Technical Education* (2001) completed by the Manpower Demonstration Research Corporation on career academics, Sarkees-Wircenski (2004) explains their results by stating, “...[they found] that participating students have improved attendance records and grades; higher self-esteem and satisfaction with school; an improved sense of connection with their teachers, other students, and school programs; lower dropout rates; lower discipline incidents; and lower sense of student apathy” (p. 19).

One area for continued growth which will prove important in the future of career and technical education is dual enrollment which enables high school students to enroll in college courses and earn credit. Such programs are growing in popularity as they are increasingly seen “...as a means to support the postsecondary preparation of average-achieving students” (National Research Center, 2010). Dual and concurrent enrollment programs have long been discussed and are rapidly growing in career and technical education, especially now that they can serve as a component of programs of study under the 2006 Perkins legislation (Lewis, 2008). Dual enrollment or concurrent enrollment affords students the opportunity to earn both high school and postsecondary credit for the

same course (Waits, 2005; Bailey & Karp, 2003; Clark, 2001). Questions surrounding this move include its structure in a school, who participates or should participate, and the benefits of such involvement. These are all questions related to and affect the sustainability of career and technical education.

Abdual-Karium (1999) explains that dual enrollment helps expand curriculum options available to high school students, helps in the transition from secondary to postsecondary education, increases the depth of study available for subjects, facilitates entry and shortens the time necessary for students to complete a postsecondary degree, and promotes collaboration between secondary and postsecondary institutions and faculty. In fact, Lewis (2008) asserts, "...there is evidence that students who earn dual enrollment credit have slightly, typically 4% to 5%, more positive outcomes in postsecondary education than similar students who do not" (p. 189). Other benefits include the reduction of college tuition, savings on money spent on textbooks in college, acceleration of student progress towards a degree or completion of a certificate or certification, and greater challenges – opportunities for rigorous coursework in preparation for college as well as motivation for students to continue postsecondary studies. This is also an opportunity for students to explore their career interests (Boswell, 2001). These, coupled with the aid in transition to postsecondary education, should support the notion behind continued development and implementation of dual enrollment programs. Karp (2006) explains, "Without a theory explaining why the expected outcomes should be anticipated, policymakers and educators will be less able to clearly articulate why dual enrollment programs should be supported...implementing dual

enrollment without clarity about what elements of the program might lead to the outcomes they value most” (p. 2).

The goals of dual enrollment mirror those of a variety of CTE reforms such as those explained in the Carl D. Perkins Act. In fact, according to a 2006 scan of state policies, 42 states have policies pertaining to dual enrollment (National Research Center, 2010). Further statistical data are also available and supports the future of dual enrollment as part of career and technical education. According to two 2005 reports from the U.S. Department of Education, 71 percent of U.S. high schools and 51 percent of U.S. postsecondary institutions permitted high school students to take college courses in 2002-03 (National Research Center, 2010). In total, 813,000 secondary school students took a college-credit course during the 12-month 2002-03 school year (National Research Center, 2010). Such data indicate that participation in such programs has increased in recent years and will continue. In fact, at the federal level, the Secretary of Education’s Commission on the Future of Higher Education has expressed support for the expansion of dual enrollment programs (National Research Center, 2010).

As Lewis (2008) explains, “The efficiency benefits are maximized if accelerated learning primarily serves students who do well in school...and the rigor benefits are maximized if accelerated learning also serves those students who are at academic risk by increasing their opinions and motivation” (p. 190). This should be part of the discussion when seeking ways to develop and implement such programs to benefit all students. Besides, dual enrollment is a way of facilitating “a broader range of students transitioning from high school to college” by linking their career pathways to corresponding coursework (Marshall & Andrews, 2002).



The integration of career and technical education and core subjects such as mathematics, science, English, and social studies is another strategy being researched to aid in program growth. This is evident recently by the huge push to incorporate science, technology, engineering, and mathematics (STEM) into CTE programs. This stimulus is a result of America's economic competitiveness as the United States explores "...ways to keep the country at the top of international innovation as other countries make technological and economic gains" (Association for Career and Technical, 2006, p. 1). President Bush's announcement of the American Competitiveness Initiative in February 2006 which focused on research and development in mathematics and science education supports this effort. With the introduction of this initiative, Congress followed suit by introducing initiatives which included "...increasing the number of temporary visas to highly skilled international professionals and providing grants to postsecondary institutions to increase the number of students in science, technology, engineering and mathematics (STEM) field" (Association for Career and Technical, 2006, p. 1). During the reauthorization of the Carl D. Perkins Career and Technical Education Improvement Act, Congress believed that more emphasis should be placed on career and technical education and, as a result, they added a new purpose which would provide individuals with opportunities to keep the United States competitive as CTE provides students with opportunities to gain critical mathematics, science, and literacy skills in relevant context – utilizing principles of inquiry-based learning and exploration (Association for Career and Technical, 2006).

## **CAREER AND TECHNICAL EDUCATION IN NORTH CAROLINA**

Although the Smith-Hughes Act of 1917 initiated United States government funding for vocational education, North Carolina education was primarily a local matter until 1930 when laws were passed giving the state public education responsibilities (Latta, 1978). The Smith-Hughes Act of 1917, known as the Vocational Act of 1917, “established the pattern of federal/state/local collaboration in initiating and implementing public vocational education programs” (Pautler, 1999, p. 36). This act helped define vocational education. According to Latta (1978), “...almost seventy years passed before vocational education was recognized in 1977 as a state function in North Carolina’s public secondary schools and community colleges/technical institutes” (para. 1). In other words, North Carolina lacked an overall vocational education policy and programs were essentially “federal programs;” however, as laws were passed this changed. Such laws included the 1937 George-Dean Act, the 1946 George-Barden Act, and the establishment in 1950 of Industrial Education Centers. In 1963 the federal Vocational Education Act and the State Community College Act were passed. These federal acts encouraged states to develop vocational education and training policies, as was the case in North Carolina. To regulate funding for such programs, the 1968 Vocational Education Amendments required the creation of state advisory councils and in 1976 North Carolina’s council recommended a state program with federal assistance. This same year, the federal Vocational Education Act passed and in 1977 North Carolina passed a State Vocational Education Law including information on vocational education (Latta, 1978). This act established vocational education as an integral part of the educational process. To further

support this idea, the board of governors recognized vocational education's importance in their long range plans from 1977-1982 (Latta, 1978).

North Carolina has expanded tremendously over the years in the area of career and technical education. The mission of career and technical education in North Carolina "...is to empower students to be successful citizens, workers, and leaders..." (Career and Technical Education, 2010, para. 1). North Carolina offers courses in eight career areas in grades six through twelve in the public school system – agriculture, business and information technology, career development, family and consumer sciences, health occupations, marketing, technology, and trade and industrial education. To accompany each program area, North Carolina offers and recognizes seven nationally supported career and technical student organizations (CTSOs), an integral part of each career and technical program area curriculum. These include Distributive Education Club of America (DECA), Future Business Leaders of America (FBLA), Family, Career and Community Leaders of America (FCCLA), National Future Farmers of America, Health Occupations Student Association (HOSA), Technology Student Association (TSA), and Vocational Industrial Clubs of America (VICA). CTSOs help develop character, citizenship, leadership, technical, and teamwork skills, and enhance students' civic awareness while providing opportunities for developing social competencies (Student Organizations, 2010).

According to 2006-2007 data from the United States Department of Education, North Carolina had a total of 552,962 CTE students – 421,775 in high schools and 131,187 in postsecondary programs – and the numbers continue to grow (North Carolina CTE State Profile, 2009). Furthermore, according to the U.S. Department of Education,

“NC delivers CTE at the secondary level through 460 comprehensive high schools and 11 schools that have CTE as the focus or are middle college schools” (North Carolina CTE State Profile, 2009, para. 2). The North Carolina Department of Public Instruction Office of Career and Technical Education is responsible for CTE programs in grades six through twelve, and the North Carolina Community College System is responsible for CTE through the Vocational Education Office of the Academic and Student Services Division. However, the North Carolina State Board of Education serves as the sole state agency for the distribution of Perkins funds (North Carolina CTE State Profile, 2009). North Carolina prides itself in having created an extensive collection of course blueprints and curriculum guides that outline exactly what skills are to be taught and how much time should be allotted to teach each skill.

In the area of assessment, at the secondary level, students are given a technical-skills assessment called a “Post Assessment” at the conclusion of the course. These assessments are offered in all eight of the program areas. According to the North Carolina CTE State Profile (2009), in 2007-2008 “60 percent of more than 500,000 students enrolled in CTE courses took technical-skills assessments” (para. 35). Assessments are secure: 500 assessment items based on course objectives are reviewed and validated externally and secured for test purposes. Three hundred are given to teachers for classroom assessment use and the remaining 200 are kept by the state to create the 100-item Post Assessment given at the end of the course (North Carolina CTE State Profile, 2009). National credentials are substituted when available. At the postsecondary level, for purposes of reporting under the 2006 Perkins Act, grade point average is used.

There are several options for CTE students to earn college credit while still in high school. First, NC has a statewide articulation agreement between community colleges and high schools that has been in place since 1999. The current 2005 agreement allows local schools to create more agreements locally and nationally based on emerging education and workforce needs (North Carolina CTE State Profile, 2009). Secondly, there is a statewide articulation agreement between NC's community colleges and public four-year universities to help ease transitions for students. Local Education Agencies (LEAs) and postsecondary institutions will use the North Carolina High School to Community College Articulation Agreement and the North Carolina Guide for Developing Local Articulation Agreements as guidance documents in developing articulation agreements. In fact, more than 40 LEAs currently have approved local articulation agreements. The statewide high school/community college articulation agreement was adopted in September 1999 and amended in November 2004. The statewide articulation equates 59 high school courses to 86 community college courses. Additional local articulation agreements are also established between individual community colleges and LEAs or four-year institutions. These local agreements often are the results of specific community needs and may not be applicable to all community colleges; however, many of the local agreements eventually become incorporated into the statewide articulation agreement (NC Five Year State Plan, 2008).

Thirdly, NC passed the Huskins Bill which makes college level academic, technical, and advanced vocational courses available for the enrichment of high school students (North Carolina CTE State Profile, 2009). Lastly, NC is expanding the Learn and Earn Program so that all students are able to attend high school located on a college

campus. In fact, "...in no more than five years, students can earn a high school diploma and finish with two years of college credit or earn an associate's degree at no cost" and in 2009, high school students were registered in a total of 5,429 college-level courses which was an increase from 2007 when only 1,421 students registered for a course through Learn and Earn (North Carolina CTE State Profile, 2009). To help further, Governor Easley created the EARN grant – a \$4,000 a year grant for low or middle income NC high school students that are enrolled (in good standing) at a North Carolina public university or community college to take a variety of online college credit courses at no cost to them or their families. Students earn both high school and college credit for completed courses. This grant was an extension for "Learn and Earn Online" (North Carolina CTE State Profile, 2009). As one acknowledges the past, considers the present, and thinks about the future of education, one recognizes that North Carolina has progressed a great deal in meeting the needs of its students and providing the skills needed for the twenty-first century, but like other states, it still has room for growth and development which is key in developing a program that is both effective and sustainable.

### **DEFINING AND IDENTIFYING FACTORS OF EDUCATIONAL SUSTAINABILITY**

Implementing and growing an effective career and technical education are important concepts. However, once a program has been implemented and has grown, how does one sustain an effective program? Theoretically, the concept of sustainability has various meanings for the individuals that may be involved – students, teachers, parents, administrators, community and business leaders, and legislatures. Sustainability, according to Konopnicki (2009), based on a definition developed from the 1987 United

Nations' *Our Common Future*, is “development that meets the needs of the present without compromising the ability of future generations to meet their own needs” (p. 44). Similarly, sustainability, according to Fullan (2002) and for the purpose of this research study, is the likelihood of a program to continuously regenerate itself in an ever-improving direction. The goal of sustainability is system improvement that is sustained – enduring, continuous, and effective. There are several important factors to consider when discussing sustainability of a program, specifically, educational programs.

How does one create a program which is both effective and sustainable?

According to Fullan (2005) there are eight elements of sustainability. These include (1) public service with moral purpose – fostering a commitment throughout the school by raising the bar and closing the gap of student learning, (2) commitment to changing context at all levels – the entire system, (3) lateral capacity building through networks – strengthening relationships amongst all stakeholders involved, (4) intelligent accountability and vertical relationships, (5) deep learning – stakeholders should understand that sustainability requires continuous improvement, adaptation, and collective problem solving in the face of complex challenges, (6) dual commitment to short-term and long-term results, (7) cyclical energizing as continuous improvement is not linear, and (8) the level of leadership – strong leadership is essential in the success of any organizational program (Fullan, 2005).

In addition to the eight elements of sustainability, attributes of effective career and technical education programs as identified by the Southern Regional Education Board and High Schools that Work (2009) include strong leadership, a plan for

continuous improvement, quality teachers and support for teachers, courses that meet the needs of the local community, and support for professional development.

In a world dependent on technology, curriculum and courses must adapt to meet the needs of students so that they are prepared to work and function productively. Kendall (2006) states, “Business and industry have been raising concerns about student abilities” (p. 12). One way to meet the needs of business and industry is to provide students with high quality programs that result in meeting the needs of both the student and industry, such as career and technical education. During the 19<sup>th</sup> century, industrial leaders complained about the shortage of clerks and bookkeepers and to address this problem Germany opened a state school to provide instruction in business education in 1847 (Bartholome, 1997). According to Bartholome (1997), “The school was very popular and became known as the Royal Realschule. The curriculum [of the Royal Realschule] related to the needs of the community in general and business in particular” (p. 4). Even during this time, individuals recognized the importance of a sustainable program to meet the needs of their community through the use of career and technical education courses, then known as vocational or workforce development education.

In 1990 the United States Secretary of Labor formed the Secretary’s Commission of Achieving Necessary Skills (SCANS) which has proven valuable in the area of career and technical education. This report examined workplace demands and determined whether current and future workers can meet them (Sarkees-Wircenski, 2004). The study reported what people need to know to succeed in future economies and determined that people being able to apply knowledge to solve workplace programs will be important – the basis of career and technical education (Sarkees-Wircenski, 2004).



Part of sustaining career and technical education will be the effect or impact of leadership. CTE leaders are vital in the efforts to implement improved educational programs that meet the needs of students and society (Context and Change, 2001). According to the National Governors Association (2007), by providing the leadership to strengthen state policies and improve coordination across agencies and systems, governors can improve the outcomes for both high school students and the workforce. Vasu (1989) explains, “Many North Carolinians do not have the skills required for the changing workplace” (p. 5). This calls into question the educational preparation of the state’s population. Vasu (1989) continues by stating, “...many workers may have difficulty in adapting to new skill requirements in an evolving job market that will increasingly distinguish between skilled and unskilled labor” (p. 5). This “skill gap” can be addressed through the use of career and technical education curriculum.

Career counselors, administrators, and teachers can take the lead in encouraging students to choose courses in the career and technical education curriculum. Huss (2001) explains, “School counselors can be key figures in the advancement of career and technical education,” therefore “preservice awareness of CTE needs to occur in the graduate programs for training school counselors” (p. 3). Counselors without knowledge or full understanding of career and technical education are unable to fully or actually guide students in selecting courses in career and technical education. Huss (2001) continues by stating that the image of CTE by many – including counselors, parents, and school administrators – is negative as they see CTE as a “dumping ground” for individuals who are low-achieving and thereby not fit for someone wishing to attend a four-year college. This perception was experienced by one employer who attended a

high school career day, according to Huss (2001) who explains, "...their industries were thwarted when interested students were discouraged from enrolling in CTE courses by their high school counselors" (p. 3). Although efforts are being made nationally that may have a positive impact on school counselors and CTE, more is needed for career and technical education programs' success, effectiveness, and sustainability for the future. Huss (2001) believes "proponents of CTE must take an advocacy role in bringing practicing school counselors on board" (p. 4). Career counselors, administrators, and teachers can have a great influence on future enrollment and career decisions of students.

Sustaining a viable career and technical education curriculum depends, of course, on funding. According to Reese (2002), "The Carl D. Perkins Vocational and Technical Education Act of 1998 provides funding for secondary and postsecondary career and technical education programs for July 1, 1999 - June 30, 2004" (p. 37). This act was reauthorized and is now funded until 2012. More specifically, Perkins funds are provided to states who then allocate these through the use of a formula to schools. States receive two main types of grants under the Perkins Act – the Basic State Grants and Tech Prep (Reese, 2002). Driscoll (2004) explained that in 2005 during President Bush's administration, career and technical education was slated for severe cuts which, if enacted would "prove devastating to education and training program in American high schools and postsecondary institutions" (p. 7). Such cuts would have forced "...already cash-strapped schools, training programs, and community colleges, to reduce or eliminate programs that are working in communities across the country" (Driscoll, 2004, p. 7). This cut would have meant real dollars cut from the lifeblood of career and technical education. According to Driscoll (2004), to protect career and technical education, the

Association for Career and Technical Education is “...working with lawmakers [constantly] to reauthorize Perkins in a manner that protects and strengthens the program” (p. 8).

To be competitive in the job market in the 21<sup>st</sup> century, students need to learn effective communication, critical thinking, problem solving, and decision making skills which are learned from courses in career and technical education. However, in order to be an integral and equal partner within a school’s educational community, CTE must proactively respond to industry needs. Bartholome (1997) explains, “During the rapid growth of business education in the 20<sup>th</sup> century education, local school boards in various states in the United States emphasized the preparation for work” (p. 12). The American Society for Training and Development and the U.S. Department of Labor suggested in a joint study that educators change their basic strategies to teach future employees how to make decisions, solve problems, learn to think a job through from start to finish, and work with people to get the job done (Bocchino, 1995). Student preparation in these skills demands a more complex high school education. As Sarkees-Wircenski (2004) explains, “...career and technical courses make the difference between living in poverty or entering the middle class” (p. 5).

Green and Seymour (1991) confront the issues of “what college students need to learn today to become business leaders of tomorrow” in their best-selling book, *Who’s Going to Run General Motors?* Their approach is strictly from a business perspective. They highlight seven fundamental skills. These include (1) communication skills – reading, writing, speaking, and listening, (2) being a team player, (3) learning and adapting to new generation of technology, (4) ability to identify and solve problems, (5)

ability to recognize global competition and expanding global markets, (6) ability to adapt to change, and (7) leadership capability. All of these can be gained from taking business and marketing courses such as e-Commerce. If the education and business community are “in sync” with the current needs of business, students will be prepared to face the challenges of business and industry. Educators must continually redefine and develop courses and/or offer courses that reflect the real world and the skills needed to succeed in global business.

Determining what the 21<sup>st</sup> century will demand of citizens and the workforce is the focus of much current discussion and debate of education and educational reform (Kendall, 2006). CTE directors and administrators must keep up-to-date on the changes in education, CTE, and business settings (Calhoun & Finch, 1982). Curriculum should reflect the expectations of the 21<sup>st</sup> century which requires change and constant revision of current standards and lessons. Career and technical education is one area that can affect change. Bartholome (1997) states:

The curriculum must always change to meet the needs of business. [CTE] must continue to rethink how people learn in a global information society because learners assume different roles in an information age. Active learning will be more popular, and learning will be a lifelong process. Learners must be able to assume greater responsibility for the learning at all levels of instruction (p. 17).

Kendall (2006) states, “Research indicates that the 21<sup>st</sup> century economy is demanding a highly skilled workforce. Witness the reliance upon high tech in such fields as auto mechanics, electronic sales, real estate, healthcare and the military – the list is endless” (p. 15). According to the Education Commission of the States, “...the economic

and social realities of the 21<sup>st</sup> century necessitate that nearly every American have access to some form of post-secondary education. One increasingly important pathway to education and training beyond high school is career and technical education” (p. 15).

According to Kendall (2006):

A survey of the National Association of Manufacturers states the majority of American manufacturers are experiencing a serious shortage of qualified employees. When asked whether K-12 schools are doing a good job preparing students for the workplace, 84 percent of respondents indicated ‘no.’ The survey reported three major areas in which public education is failing to prepare students for the workplace: (1) Students lack basic employability skills, (2) Students lack adequate mathematics and science skills that a highly qualified 21<sup>st</sup> century workforce demands, and (3) Students are deficient in reading and comprehension skills. (pp. 12-13)

Kendall lists several 21<sup>st</sup> century skills which do not currently show up in school content standards, but should. These include: (1) communicating effectively via e-mail, (2) analyzing information from non-print media, (3) logic and the ability to reason in order to make sound choices, (4) working as a team on long-term collaborative projects, (5) being able to conduct significant research projects, (6) proficiency in data interpretation, statistics, and probability, (7) knowing when to use appropriate mathematical operations, and (8) practical use of geometry in areas such as construction, measurement, and map reading (Kendall, 2006). Certifications and credentialing has also been a topic of discussion to help meet the needs of individuals and business and industry. Wilcox (2006) explains, “The appeal of industry-based certifications emerges

from a continuing need to prove relevance and impact” (p. 21). These needs include program relevancy, consistency of results, accountability, nationally portable credentials, control educational costs, and coherent programs of study.

Twenty-first century skills continue to be a priority for schools. A national organization that advocates for 21<sup>st</sup> century readiness is The Partnership for 21<sup>st</sup> Century Skills. The Partnership for 21<sup>st</sup> Century Skills (2004) explains, “...students must learn the essential skills for success in today’s world, such as critical thinking, problem solving, communication and collaboration” (p. 1). The Partnership for 21<sup>st</sup> Century Skills aims to incorporate 21<sup>st</sup> century interdisciplinary themes into core subjects that include global awareness, financial, economic, business and entrepreneurial literacy, civic literacy, health literacy, and environmental literacy. They also focus on life and career skills; all skills provided students through participation in career and technical education.

Sarkees-Wircenski (2004) explains, “Changes in the economy and in education are altering the way business and industry works and have implications for the skills required of new employees” (p. 23). In fact, increasing global competition has led to many mergers and “high performance workplaces” (Sarkees-Wircenski, 2004). Career and technical education programs will therefore be needed to continue preparing workers for employment and will thus require career and technical education to implement programs to prepare students for jobs in the service and information industries (Sarkees-Wircenski, 2004).

## **SUMMARY**

As the economy tightens many schools are looking at ways to “cut” or “reduce” unnecessary programs. Career and technical education is essential in the reform of

education in America (NASDCT, 2001). Through this study research provides readers with the benefits of an effective career and technical education program which could be used to justify the importance of such a program, not just for students but for all stakeholders. By examining the evolution of career and technical education as well as reform and effective strategies used to encourage growth and factors to attain educational sustainability, one will be able to better understand the importance of this topic.

Chapter III, Methods and Procedures, describes the methods and procedures utilized to collect and analyze data. Chapter III also includes details about the population, instrument design, and provides an explanation of statistical methods used to analyze data.

## **CHAPTER III**

### **METHODS AND PROCEDURES**

Chapter III contains the methods and procedures used to gather data in this descriptive research study. Descriptive research describes systematically a situation or area of interest. The focus of the study was to identify components needed for the design of a sustainable career and technical education program. This chapter discusses the population chosen for this study, instrument design, the methods of data collection, and statistical analysis. This chapter concludes with a summary.

### **POPULATION**

The population for this study was career and technical education directors in North Carolina who were employed during the 2011-2012 academic school year. The directors worked in eight educational regions including Northeast, Southeast, North Central, South Central, Central, Northwest, Southwest, and Western. The data collection strategy used purposeful selection. There are 115 – 100 county units and 15 city units – traditional public school districts in the state of North Carolina thus the researcher asked 115 directors to participate, one career and technical education director from each local education agency (LEA) referred to as a school district in the state of North Carolina.

Career and technical education directors were defined for the purpose of this study as individuals whose duties included supervising, planning, obtaining resources, approving expenditures, and implementing and evaluating programs in the area of career and technical education. The essential duties of this individual include researching and maintaining current knowledge of local, state, and federal laws, policies, procedures, and funding sources necessary to communicate pertinent information to principals and



teachers in order to achieve curriculum objectives, changes, and improvements. In North Carolina, the minimum education requirements included a master's degree in education, career and technical education, counseling, or a related field, a career and technical education director certification, and five years of experience in education or any equivalent combination of training and experience which provides the required knowledge, skills, experience, and abilities.

### **INSTRUMENT DESIGN**

A survey method was selected for data collection because of its rapid turnaround, ease of administration, and ease of the design (Babbie, 1990). Survey data can provide information to improve programs as data collected can show trends, including growth or decline, changes in attitudes, and perceptions of participants (Walonick, 1998). The researcher used the literature to define the three research objectives. RO<sub>1</sub> sought factors that support the implementation of a career and technical education program, RO<sub>2</sub> sought factors that facilitate growth of career and technical education programs, and RO<sub>3</sub> sought factors necessary to sustain an effective career and technical education program. Based on the goals, the literature was reviewed to determine the variables in career and technical education that make up an effective program, facilitate program growth, and sustain effective programs.

The variables for this study were first developed into a content matrix and then used to develop survey questions based upon the research objectives. See Table 1 for key constructs, variables, and supporting literature.

From these research objectives and their supporting variables, the survey was constructed as at the time of this study there were no empirically validated surveys

available. All closed-form questions used the Likert scale. The items were measured on a continuous scale of strongly disagree (1) to strongly agree (5). Section 1 of the survey addresses factors that support the implementation of a career and technical education program, Section 2 addresses factors that facilitate the growth of career and technical education programs, Section 3 addresses factors necessary to sustain an effective career and technical education program, and Section 4 contains demographic questions.

Table 1

*Research Objective Concept Matrix*

Key Construct(s)	Variable(s)	Supporting Literature
RO <sub>1</sub> : Factors that support the implementation of a career and technical education program	Teachers hold appropriate degrees and licenses	Klein (2010); Silverberg (2004); US Department of Education Office of Vocational and Adult Education (2006)
	Sequence of rigorous coursework	Driscoll (2004); Arizona Department of Education (2011); Klein (2010); Minnesota Department of Education (2006)
	Integration of career and technical education and core subjects	Association of Career and Technical (2006)
	Work-based learning experiences	Driscoll (2004); Kendall (2006); NC Department of Public Instruction (2009); Arizona Department of Education (2011)

Table 1  
(continued)

Key Construct(s)	Variable(s)	Supporting Literature
	Career academies	Sarkees-Wircenski (2004)
	Student organizations	Student Organizations (2010); Career and Technical Education (2010)
	Technical assessments	North Carolina CTE State Profile (2009); US Department of Education (2006)
	Support and guidance during registration	Huss (2001); Context and Change (2001); National Governors Association (2007)
	Counselors can advise on the benefits of CTE and aid students in course selection	Huss (2001)
	Established goals, objectives, and a mission	US Department of Education Office of Vocational and Adult Education (2006)
	An established operating budget to fund facilities and equipment	Reese (2002); Driscoll (2004)
RO <sub>2</sub> : Factors that facilitate the growth of career and technical education programs	Local and state articulation agreements	US Department of Education Office of Vocational and Adult Education (2006); North Carolina CTE State Profile (2009)
	Dual enrollment opportunities have been established and are offered as course possibilities	National Research Center (2010); Bailey & Karp (2003)

Table 1  
(continued)

Key Construct(s)	Variable(s)	Supporting Literature
	Collaboration with local business and industry	NC Department of Public Instruction (2009); US Department of Education Office of Vocational and Adult Education (2006)
	Students have access to industry credential exams	Sarkees-Wircenski (2004)
	Workforce readiness skills have been identified and incorporated into CTE course offerings	Sarkees-Wircenski (2004)
	Collaboration with local community colleges and universities	Silverberg (2004); US Department of Education Office of Vocational and Adult Education (2006)
	Students and parents understand the advantages of articulated courses being offered	Klein (2010); Silverberg (2004)
	A method for program evaluation	Klein (2010); Silverberg (2004)
	District evaluates program on a regular basis	Arizona Department of Education (2011); Klein (2010); Silverberg (2004); US Department of Education Office of Vocational and Adult Education (2006)
	Career pathways are available within the school system and understood by teachers	NC Career Clusters (2009)

Table 1  
(continued)

Key Construct(s)	Variable(s)	Supporting Literature
	Guidelines are established for tracking completers	Klein (2010); Silverberg (2004)
	Program marketing strategies are in place	Klein (2010); Silverberg (2004)
RO <sub>3</sub> : Factors necessary to sustain an effective career and technical education program.	Professional development for instructors	Klein (2010); Silverberg (2004); US Department of Education Office of Vocational and Adult Education (2006)
	Equipment and technology recommended for teaching are present	Klein (2010); NC Department of Public Instruction (2009); Silverberg (2004)
	Program administrator has a background in CTE	Klein (2010); Silverberg (2004)
	Strong leadership is in place at the state and local level who understand and support CTE	National Governors Association (2007)
	Resources and support are sought	Klein (2010); Minnesota Department of Education (2006); NC Department of Public Instruction (2009)
	Information is disseminated to all stakeholders	Arizona Department of Education (2011); Klein (2010); Silverberg (2004)

Table 1  
(continued)

Key Construct(s)	Variable(s)	Supporting Literature
	Data from technical assessments are used in decision-making	Arizona Department of Education (2011); Klein (2010); Silverberg (2004)
	An advisory committee has been established	Klein (2010); US Department of Education Office of Vocational and Adult Education (2006)
	Funding has been secured and is continually sought	Reese (2002); Driscoll (2004)

RO<sub>1</sub> sought factors that support the implementation of a career and technical education program. The statements in Section 1 of the survey include: (1) Teachers hold appropriate degrees and licenses, (2) There is a set sequence of rigorous courses that are relevant to specific career clusters that combines academic and technical concepts and skills, (3) Integration of career and technical education and core subjects, (4) Work-based learning, such as co-op and internship programs have been established, (5) Career academies, (6) Career and technical education students organizations have been established and are active, (7) Technical assessments have been established and are used within the district, (8) Students are provided support and guidance during course selection which includes their options to take career and technical education courses, (9) Counselors can advise on the benefits of CTE and aid students in course selection, (10)

The district has established goals, objectives, and a mission, and (11) an operating budget has been established to fund adequate facilities and equipment.

RO<sub>2</sub> sought factors that facilitate growth of career and technical education programs. Using the 5-point Likert scale respondents were asked to identify the degree to which each factor aided in growth of career and technical education programs. Respondents gave feedback on the following statements: (1) Local and state articulation agreements have been established, (2) Dual enrollment opportunities have been established and are offered as course possibilities, (3) Collaboration with local business and industry has been established, (4) Students have access to industry credentialing exams, (5) Workforce readiness skills have been identified and incorporated into CTE course offerings, (6) Collaboration with local community colleges and universities has been established, (7) Student and parents understand and take advantage of the courses offered within your district that are articulated in the state and local articulation agreements, (8) The district has established a method to evaluate the career and technical education program, (9) The district evaluates the career and technical education program on a regular basis, (10) Career pathways/career clusters are available within the school system and are understood by teachers, (11) The district has established guidelines for tracking course completers, and (12) The district has established program marketing and public relations strategies.

RO<sub>3</sub> sought factors necessary to sustain an effective career and technical education program. Using the 5-point Likert scale, from Strongly Disagree (1) to Strongly Agree (5), respondents were asked to identify the degree to which each of the following elements factored into sustaining an effective career and technical education

program. The statements respondents were asked included: (1) Professional development for instructors are offered on a continual basis, (2) Teachers have the equipment and technology recommended for teaching, (3) There is a program administrator with a background in career and technical education and an understanding of its importance, (4) Strong leadership is in place at the state and local level who understand and support CTE, (5) Resources and support are continually being sought, (6) Information is disseminated to all stakeholders – students, parents, administrators, and community and business leaders – on a regular basis to provide updates and feedback, (7) Data from technical assessments are used in decision-making, (8) An advisory committee for career and technical education has been established, and (9) Funding has been secured and is continually sought. The only open-ended question was also located in Section 3. Question 8 asked participants to please list any comments they would like to add concerning their career and technical education program that they believed were factors in helping sustain and grow their program.

Demographic questions were located in Section 4 of the survey. It included four questions. Participants were asked to indicate their years of experience in career and technical education, their years of experience as a career and technical education director, describe their geographic region, and list the percentage of students who receive free and/or reduced lunch in their district.

## **PILOT STUDY**

After development, the survey was pilot tested twice – once for validity with content experts and once for reliability with a group of career and technical education directors at the North Carolina Department of Public Instruction. The purpose of the



pilot study was to strengthen the validity of the instrument. The survey was reviewed for validity through an analysis by ten experts. The expert panel consisted of career and technical education administrators and professors familiar with career and technical education and survey research methods was asked to review the instrument and make recommendations. Experts were employees of colleges and universities in North Carolina. The ten experts asked to participate reviewed the survey during the first pilot study for content validity. The participants were given the initial instrument (Appendix A) and a cover letter (Appendix B) asking them to evaluate the content validity of the instrument. They were also given the content matrix (Appendix C) and a check sheet (Appendix D) to guide their reviews. Results were analyzed and changes made to address content problems or survey administration problems as deemed necessary.

The check sheet asked participants to evaluate the survey using a Likert-scale (1 representing strongly disagree and 5 representing strongly agree). The check sheet included the following questions: (1) The survey meets the data collection needs of the study as defined by the problem statement and research objectives, (2) The directions were clearly stated for completing the survey, (3) The survey questions and/or statements in Section I (addressing RO<sub>1</sub>) were clear and addressed the variables for this construct. If not, please list under comments or indicate on the survey areas for improvement and/or additions that can be added to the survey, (4) The survey questions and/or statements in Section II (addressing RO<sub>2</sub>) were clear and addressed the variables for this construct. If not, please list under comments or indicate on the survey areas for improvement and/or additions that can be added to the survey, (5) The survey questions and/or statements in Section III (addressing RO<sub>3</sub>) were clear and addressed the variables for this construct. If

not, please list under comments or indicate on the survey areas for improvement and/or additions that can be added to the survey, and (6) There are no grammatical and/or spelling errors. If so, please list under comments or indicate on the survey. The researcher then reviewed the recommendations and comments and made adjustments as needed.

The researcher reviewed the recommendations from the content experts and appropriately applied recommendations that were determined to strengthen the survey's usability. The decision to accept or decline each recommendation was based upon the frequency of occurrence and relevance to this study. Changes were minimal. The feedback provided by the content experts were consistent and included recommendations such as adding definitions of key words to provide participants with a similar definition within the questions for words such as career pathways, regular basis, rigorous courses, active, and professional development. Other suggestions included moving questions among sections to better align with research objectives and the addition of two questions.

Specifically, the researcher moved the question addressing teachers holding an appropriate degree and/or licenses for the courses they taught from Section 3 to Section 1, the insertion of examples of work-based learning experiences and a definition of work-based learning experiences to a question in Section 1, the addition of the definition of career academies in Section 1, the movement of the question addressing dual enrollment from Section 1 to Section 2, the addition of a question addressing an operating budget being established to fund adequate facilities and equipment to Section 1, and the addition of a question to Section 2 addressing that the district has a local and state articulation agreement with community colleges and/or universities for courses offered. These were

new questions added to the instrument. Additionally, the researcher moved a question from Section 1 addressing dual enrollment to Section 2, the addition of a definition of career pathways to the addressing question in Section 2, and moving the question addressing professional development of teachers from Section 2 to Section 3. The researcher applied the accepted recommendations to the final survey as shown in Appendix I.

For reliability, Isaac and Michael (1997) suggest that 10 to 30 subjects are needed for an effective pilot test; therefore, the instrument was submitted to 10 state career and technical educator program directors employed at the North Carolina Department of Public Instruction and a retired career and technical education director. All eleven completed the second pilot study. Directors completed the revised survey, Appendix E, under the identical conditions that the study subjects would encounter. They were provided a letter requesting participation (Appendix G) and a questionnaire (Appendix H) to determine reliability in responding to each question. After the surveys were completed, data were compiled and tabulated by the researcher. Standard deviation was used to determine reliability of questions. After reviewing the data collected, no changes were necessary. See Appendix I for the final survey.

### **METHODS OF DATA COLLECTION**

The survey used in this study was distributed to Career and Technical Education Directors in North Carolina. One hundred–fifteen North Carolina CTE Directors were asked to participate. Directors' names and contact information were obtained from the Internet – local school district webpages by the researcher.

Surveys were administered via e-mail in the fall of 2011 in the months of December and January using an online tool, Zoomerang<sup>TM</sup>, a commercial product, to deploy the survey, Appendix I. This product provided the researcher an opportunity to construct a survey, e-mail to participants, and collect descriptive information. A letter included in the body of an e-mail, Appendix J, explaining the survey and ensuring participant confidentiality accompanied the survey. Follow-up e-mails, Appendix K, with the link were sent to those who had not responded within seven days of the original survey and a second follow-up was sent again in January after the winter holiday in December. The first letter and survey were distributed to participants on December 6<sup>th</sup>, 2011, with the follow letter and survey sent on December 15<sup>th</sup>, 2011, and January 3<sup>rd</sup>, 2012. The survey process closed on January 11<sup>th</sup>, 2012.

### **STATISTICAL ANALYSIS**

After the surveys were collected, data were compiled and tabulated. Descriptive statistical analyses were employed to describe data from the survey using Statistical Package for the Social Sciences (SPSS), a computer software program. One hundred–fifteen Career and Technical Education Directors were sent surveys to complete. Number of responses, percentages, and means were calculated to determine the total number of respondents' selections based on the Likert scale choices.

Factor analysis and reliability analysis was completed. Specifically, Cronbach's Alpha was used for reliability and Kaiser-Meyer-Olkin was used for factor analysis to measure and report for each research objective – RO<sub>1</sub>, RO<sub>2</sub>, and RO<sub>3</sub>. Factor analysis allowed the researcher to describe the variability among observed correlated variables.

## SUMMARY

Chapter III presented the methods and procedures that were utilized to obtain the essential data for this study. This descriptive study surveyed 115 Career and Technical Education Directors in North Carolina who were divided among eight educational regions – Northeast, Southeast, North Central, South Central, Central, Northwest, Southwest, and Western. The survey contained 36 questions – 35 closed-form questions and one open-form question – divided amongst four sections. All closed-form questions used the Likert scale. Section 1 addressed RO<sub>1</sub>, factors that support the implementation of a career and technical education program, Section 2 addressed RO<sub>2</sub>, factors that facilitate the growth of career and technical education programs, and Section 3 addressed RO<sub>3</sub>, factors necessary to sustain an effective career and technical education program. Section 4 contained demographic questions. The survey was sent to participants in an e-mail. Follow-up e-mails with the link were sent to those who had not participated within two weeks of the original survey followed by personal phone calls to encourage participation. Data were then compiled and tabulated to determine the frequencies of response and data were examined with regard to the comparisons of the career and technical education director's perceptions toward sustainable career and technical education programs. A descriptive statistical analysis using numbers, percentages, and means was used. Cronbach's Alpha was found during a reliability analysis and factor analysis was used to describe the variability among observed correlated variables. The findings of data collected are reported in Chapter IV.

## CHAPTER IV

### FINDINGS

The problem of this study was to identify components needed for the design of a sustainable career and technical education program. This chapter presents the data that were collected with the intent of addressing the following research questions:

RO<sub>1</sub>: Determine the factors that support the implementation of a career and technical education program.

RO<sub>2</sub>: Determine factors that facilitate the growth of career and technical education programs.

RO<sub>3</sub>: Determine factors necessary to sustain an effective career and technical education program.

A 36 question survey – 35 close-ended questions and one open-ended question – was developed to collect data necessary to answer the three research questions. This chapter provides the findings derived from that survey under the sub-headings of response rate, survey responses, further analyses, and a summary of findings.

### RESPONSE RATE

The population of this study included 115 (N=115) career and technical education directors in North Carolina distributed across eight educational regions – Southeast, Southwest, Northeast, Northwest, Western, North Central, South Central, and Central. One hundred were from county agencies and 15 were from city agencies. A career and education director from each local education agency was asked to participate. From those surveyed, 106 surveys were collected for a return rate of 92.17%. The response rate was significant based on *Educational and Psychological Measurement's* sample size

for research activities table (Krejcie, 1970). A minimum sample size of 89 was needed to be significant for a population of 115 participants and was surpassed, having received 106 completed surveys.

## **SURVEY RESPONSES**

The survey was divided into four sections – Section 1: Factors of Effective CTE Programs, Section 2: Factors that Facilitate the Growth of CTE Programs, Section 3: Factors Necessary to Sustain an Effective CTE Program, and Section 4: Demographics. Section 1 included 13 questions, Section 2 included 13 questions, Section 3 included 10 questions, and Section 4 included four questions. Participants were asked to respond to questions that addressed importance of components related to career and technical education programs and what effective programs should include in their design by selecting from Strongly Disagree (1) to Strongly Agree (5) on a Likert scale.

Descriptive statistical analysis was employed to describe data from the survey using Statistical Package for the Social Sciences (SPSS), a computer software program. The number of responses for each question were calculated to determine percentages related to each Likert scale choice. The mean score was then calculated to determine the central tendency for each question. One hundred–six (106) surveys were completed and used in data analysis.

### *Section 1*

Question 1 addressed the statement: Teachers hold appropriate degrees and/or licenses for the courses taught. One (1%) selected strongly disagree, one (1%) disagree, four (4%) neither disagree nor agree, 33 (31%) agree, and 67 (63%) strongly agree. The

mean was 4.55 and the standard deviation was 0.706 indicating that the respondents strongly agreed to this statement.

Question 2 addressed the statement: There is a set sequence of rigorous courses (which have been identified and standards adhered to) that are relevant to the 16 national career clusters and combine academic and technical concepts and skills. Five (5%) selected disagree, six (6%) neither disagree nor agree, 47 (44%) agree, and 48 (45%) strongly agree. The mean was 4.30 and the standard deviation was 0.783 indicating that the respondents agreed to this statement.

Question 3 addressed the statement: Integration of career and technical education and core standards occur in your district. One (1%) strongly disagree, 13 (12%) disagree, 13 (12%) neither disagree nor agree, 59 (56%) agree, and 20 (19%) strongly agree. The mean was 3.79 and the standard deviation was 0.923 indicating that the respondents agreed to this statement.

Question 4 addressed the statement: Work-based learning, opportunities for students to see how classroom instruction connects to the world of work through hands-on application, has been established in your district (i.e., co-op, internships, co-curricular organization involvement, job shadowing, field trips, service learning). Two (2%) strongly disagree, four (4%) disagree, eight (8%) neither disagree nor agree, 46 (43%) agree, and 46 (43%) strongly agree. The mean was 4.23 and the standard deviation was 0.887 indicating that the respondents agreed to this statement.

Question 5 addressed the statement: Career academies, learning communities focused on a specific career cluster or pathway, have been established. Seven (7%) strongly disagree, 23 (22%) disagree, 21 (20%) neither disagree nor agree, 38 (36%)



agree, and 17 (16%) strongly agree. The mean was 3.33 and the standard deviation was 1.177 indicating that respondents neither agreed nor strongly agreed to this statement.

Question 6 addressed the statement: Career and technical education student organizations have been established and are active (i.e., student organizations meet throughout the year to plan, discuss, and implement projects). Ten (9%) disagree, seven (7%) neither disagree nor agree, 53 (50%) agree, and 36 (34%) strongly agree. The mean was 4.08 and the standard deviation was 0.885 indicating that respondents agreed to this statement.

Question 7 addressed the statement: Technical assessments have been established and are used within the district. One (1%) strongly disagree, three (3%) disagree, seven (7%) neither disagree nor agree, 35 (33%) agree, and 60 (57%) strongly agree. The mean was 4.42 and the standard deviation was 0.815 indicating that respondents agreed to this statement.

Question 8 addressed the statement: Students are provided support and guidance during course selection which includes their options to take career and technical education courses. Seven (7%) disagree, ten (9%) neither disagree nor agree, 41 (39%) agree, and 48 (45%) strongly agree. The mean was 4.23 and the standard deviation was 0.876 indicating that respondents agreed to this statement.

Question 9 addressed the statement: Counselors can advise on the benefits of career and technical education and aid students in course and program selection. Two (2%) strongly disagree, eleven (10%) disagree, 12 (11%) neither disagree nor agree, 51 (48%) agree, and 30 (28%) strongly agree. The mean was 3.91 and the standard deviation was 0.991 indicating that respondents agreed to this statement.

Question 10 addressed the statement: The district has established a mission for the career and technical education program. Seven (7%) disagree, 16 (15%) neither disagree nor agree, 53 (50%) agree, and 30 (28%) strongly agree. The mean was 4.00 and the standard deviation was 0.840 indicating that respondents agreed to this statement.

Question 11 addressed the statement: The district has established goals for the career and technical education program. Two (2%) disagree, seven (7%) neither disagree nor agree, 64 (60%) agree, and 33 (31%) strongly agree. The mean was 4.21 and the standard deviation was 0.643 indicating that respondents agreed to this statement.

Question 12 addressed the statement: The district has established objectives for the career and technical education program. Four (4%) disagree, 14 (13%) neither disagree nor agree, 60 (57%) agree, and 28 (26%) strongly agree. The mean was 4.06 and the standard deviation was 0.741 indicating that respondents agreed to this statement.

Question 13 addressed the statement: An operating budget has been established to fund adequate facilities and equipment. Eight (8%) disagree, eight (8%) neither disagree nor agree, 56 (53%) agree, and 34 (32%) strongly agree. The mean was 4.09 and the standard deviation was 0.834 indicating that respondents agreed to this statement.

## *Section 2*

Question 14 addressed the statement: The district has a local and state articulation agreement with community colleges and/or universities for courses offered. Four (4%) disagree, three (3%) neither disagree nor agree, 46 (43%) agree, and 53 (50%) strongly agree. The mean was 4.40 and the standard deviation was 0.726 indicating that respondents agreed to this statement.

Question 15 addressed the statement: Dual enrollment opportunities have been established and are offered as course possibilities. One (1%) strongly disagree, six (6%) disagree, 11 (10%) neither disagree nor agree, 55 (52%) agree, and 33 (31%) strongly agree. The mean was 4.07 and the standard deviation was 0.854 indicating that respondents agreed to this statement.

Question 16 addressed the statement: Collaboration with local business and industry has been established. Four (4%) disagree, nine (8%) neither disagree nor agree, 62 (58%) agree, and 31 (29%) strongly agree. The mean was 4.13 and the standard deviation was 0.718 indicating that respondents agreed to this statement.

Question 17 addressed the statement: Students have access to industry credentialing exams. Two (2%) disagree, seven (7%) neither agree nor disagree, 51 (48%) agree, and 46 (43%) strongly agree. The mean was 4.33 and the standard deviation was 0.686 indicating that respondents agreed to this statement.

Question 18 addressed the statement: Workforce readiness skills have been identified and incorporated into career and technical education course offerings. Nine (8%) neither disagree nor agree, 63 (59%) agree, and 34 (32%) strongly agree. The mean was 4.24 and the standard deviation was 0.594 indicating that respondents agreed to this statement.

Question 19 addressed the statement: Collaborations with local community colleges and universities have been established. Three (3%) neither disagree nor agree, 61 (58%) agree, and 42 (40%) strongly agree. The mean was 4.37 and the standard deviation was 0.540 indicating that respondents agreed to this statement.

Question 20 addressed the statement: Students and parents understand and take advantage of the courses offered within your district that are articulated in state and local articulation agreements. Thirteen (12%) disagree, 25 (24%) neither disagree nor agree, 53 (50%) agree, and 15 (14%) strongly agree. The mean was 3.66 and the standard deviation was 0.872 indicating that respondents agreed to this statement.

Question 21 addressed the statement: The district has established a method to evaluate the career and technical education program. Seven (7%) disagree, 16 (15%) neither disagree nor agree, 62 (58%) agree, and 21 (20%) strongly agree. The mean was 3.92 and the standard deviation was 0.782 indicating that respondents agreed to this statement.

Question 22 addressed the statement: The district evaluates the career and technical education program on a regular basis (i.e., at a minimum once a year). Two (2%) strongly disagree, eight (8%) disagree, 14 (13%) neither disagree nor agree, 60 (57%) agree, and 22 (21%) strongly agree. The mean was 3.87 and the standard deviation was 0.895 indicating that respondents agreed to this statement.

Question 23 addressed the statement: Career pathways/career clusters are available within the school system and understood by teachers. One (1%) strongly disagree, eight (8%) disagree, 22 (21%) neither disagree nor agree, 58 (55%) agree, and 17 (16%) strongly agree. The mean was 3.77 and the standard deviation was 0.843 indicating that respondents agreed to this statement.

Question 24 addressed the statement: The district implements career pathways/career clusters. One (1%) strongly disagree, five (5%) disagree, five (5%) neither disagree nor agree, 62 (58%) agree, and 33 (31%) strongly agree. The mean was

4.14 and the standard deviation was 0.786 indicating that respondents agreed to this statement.

Question 25 addressed the statement: The district established guidelines for tracking course completers. Two (2%) strongly disagree, three (3%) disagree, six (6%) neither disagree nor agree, 61 (58%) agree, and 34 (32%) strongly agree. The mean was 4.15 and the standard deviation was 0.802 indicating that respondents agreed to this statement.

Question 26 addressed the statement: The district has established program marketing and public relations strategies. Nine (8%) disagree, 28 (26%) neither disagree nor agree, 50 (47%) agree, and 19 (18%) strongly agree. The mean was 3.75 and the standard deviation was 0.851 indicating that respondents agreed to this statement.

### *Section 3*

Question 27 addressed the statement: Instructors are provided opportunities for continued professional development (i.e., professional development is offered to instructors at a minimum yearly). Four (4%) neither disagree nor agree, 48 (45%) agree, and 54 (51%) strongly agree. The mean was 4.47 and the standard deviation was 0.573 indicating that respondents agreed to this statement.

Question 28 addressed the statement: Teachers have the equipment and technology recommended to support teaching of career and technical education courses. Four (4%) disagree, seven (7%) neither disagree nor agree, 42 (40%) agree, and 53 (50%) strongly agree. The mean was 4.36 and the standard deviation was 0.771 indicating that respondents agreed to this statement.

Question 29 addressed the statement: The program administrator has a background in career and technical education and understands the importance of the program to the district. Two (2%) strongly disagree, eight (8%) disagree, ten (9%) neither disagree nor agree, 32 (30%) agree, and 54 (51%) strongly agree. The mean was 4.21 and the standard deviation was 1.021 indicating that respondents agreed to this statement.

Question 30 addressed the statement: Strong leadership is in place at the state and local level with an understanding of and support for career and technical education programs. One (1%) strongly disagree, two (2%) disagree, seven (7%) neither disagree nor agree, 45 (42%) agree, and 51 (48%) strongly agree. The mean was 4.35 and the standard deviation was 0.769 indicating that respondents agreed to this statement.

Question 31 addressed the statement: Resources and support are continually being sought. One (1%) disagree, five (5%) neither disagree nor agree, 65 (61%) agree, and 35 (33%) strongly agree. The mean was 4.26 and the standard deviation was 0.590 indicating that respondents agreed to this statement.

Question 32 addressed the statement: Information is disseminated to all stakeholders – students, parents, administrators, and community and business leaders – on a regular basis (at a minimum once a year) to provide updates and feedback. Eight (8%) disagree, 16 (15%) neither disagree nor agree, 67 (63%) agree, and 15 (14%) strongly agree. The mean was 3.84 and the standard deviation was 0.758 indicating that respondents agreed to this statement.

Question 33 addressed the statement: Data from technical assessments are used in decision-making. Three (3%) disagree, nine (8%) neither disagree nor agree, 58 (55%)

agree, and 36 (34%) strongly agree. The mean was 4.20 and the standard deviation was 0.709 indicating that respondents agreed to this statement.

Question 34 addressed the statement: An advisory committee for career and technical education has been established. Ten (9%) disagree, 30 (28%) neither disagree nor agree, 39 (37%) agree, 27 (25%) strongly agree. The mean was 3.78 and the standard deviation was 0.936 indicating that respondents agreed to this statement.

Question 35 addressed the statement: Funding has been secured and is continually being sought. Eleven (10%) neither disagree nor agree, 67 (63%) agree, and 28 (26%) strongly agree. The mean was 4.16 and the standard deviation was 0.588 indicating that respondents agreed to this statement.

Question 36 addressed the statement: Please list any comment you would like to add about your career and technical education program that you believe is a factor in helping to sustain and grow your program. This was the only open-ended question included in the survey. Of the 106 participants, 14 participants (13%) opted to list a factor for Question 36. Each of the 14 participants who listed a comment listed only one comment. Each of these comments listed by the participants was addressed in the survey by the researcher. Comments addressed the importance of career and technical education programs having a strong partnership with community colleges, business, and local community industries which was addressed by Questions 14, 16, 19, 29, and 30; support and individuals being knowledgeable about career and technical education including the principals, core subject area teachers, and superintendent was addressed by Questions 9, 23, 29, 30, and 32; the understanding of pathways by all stakeholders was addressed by Questions 2, 8, 23, 24, and 25; and the importance of publicity was addressed by

Question 26. See Appendix L for a detailed list of comments from Question 36 of the survey.

#### *Section 4*

Questions 37-40 were demographic questions. Question 37 asked participants to indicate their years of experience in CTE. Seven (56%) participants had 0-4 years, 16 (15%) 5-9 years, 26 (25%) 10-14 years, 18 (17%) 15-19 years, and 39 (37%) 20+ years of experience. Based on responses, most CTE Directors have 0-4 years of experience in CTE. See Table 2.

Table 2

*Experience in CTE, n=81*

Experience in CTE	Number of Participants	Percentage
0-4 years	7	56%
5-9 years	16	15%
10-14 years	26	25%
15-19 years	18	17%
20+ years	39	37%

Question 38 asked participants to indicate their years of experience in CTE. Fifty (47%) participants had 0-4 years, 39 (37%) had 5-9 years, 11 (10%) had 10-14 years, three (3%) had 15-19 years, and three (3%) had 20+ years of experience as a CTE Director. Based on responses, most CTE Directors had been in their position as a director for 0-4 years. See Table 3.



Table 3

*Experience as CTE Directors, n=81*

Experience as CTE Director	Number of Participants	Percentage
0-4 years	50	47%
5-9 years	39	37%
10-14 years	11	10%
15-19 years	3	3%
20+ years	3	3%

Question 39 asked participants to indicate the geographic description of their district. Seventy-two (68%) individuals were from a rural area, 18 (17%) from a suburban area, and 16 (15%) were from an urban area. Rural was defined as a locale with a density less than 500 people per square mile and more than 30 miles from an urban area. Suburban was defined as a locale no more than 30 miles from an urban area or with a density greater than or equal to 500 people per square mile and less than 2,000 people per square mile. Urban was defined as a locale with a density greater than or equal to 2,000 people per square mile or a place that has a total population greater than or equal to 100,000 people. Based on responses, most CTE Directors work in rural areas in North Carolina. The demographics for Questions 37 – 39 are displayed in Table 4.

Table 4

*Geographic Demographics, n=81*

Geographic Demographics	Number of Participants	Percentage
Rural	72	68%
Suburban	18	17%
Urban	16	15%

Question 40 asked participants to list the percentage of students in their district who received free and/or reduced lunch if known. 89 participants of the 106 participating, 84%, reported free and/or reduced lunch percentages. Seventeen participants were unsure of the percentages for their district. The lowest percentage of students receiving free and/or reduced lunch was 23.3% and the greatest percentage of students receiving free and/or reduced lunch within a given LEA (local education agency) from those participating in the study was 90%. The mean was 58.29%.

### **FURTHER ANALYSIS**

Factor analyses were completed for each research objective to describe variability among observed correlated variables. By completing such an analysis one can produce a small number of factors from a large number which is helpful in explaining the observed variance in the larger number of variables. Initially, the factorability of the 13 items for Research Objective 1 was examined. Several well-recognized criteria for the factorability of a correlation were used. Thirteen of the 13 items correlated at least 0.3 with at least one other item, suggesting reasonable factorability. The Kaiser-Meyer-

Olkin measure of sampling adequacy was 0.773, above the recommended value of 0.5, and Bartlett's test of sphericity was significant ( $\chi^2 (78) = 585.45, p < 0.05$ ). Principal component analysis requires that the probability associated with Bartlett's test of sphericity be less than the level of significance. The probability associated with the Bartlett test is  $<0.001$  which satisfies this requirement. The diagonals of the anti-image correlation matrix were all over 0.5, supporting the inclusion of each item in the factor analysis. Finally, the communalities were all above 0.3 (see Table 5), further confirming that each item shared some common variance with other items. Given these overall indicators, factor analysis was conducted with all 13 items from Section 1 addressing Research Objective 1.

Table 5

*Communalities, Research Objective 1*

	Initial	Extraction
Q1: Teacher Degree	1.000	0.737
Q2: Rigorous Courses	1.000	0.715
Q3: Integration	1.000	0.548
Q4: Work based	1.000	0.828
Q5: Career Academies	1.000	0.667
Q6: Student Orgs	1.000	0.644
Q7: Technical Assess	1.000	0.425
Q8: Stud Support	1.000	0.649
Q9: Counselors	1.000	0.657
Q10: Mission	1.000	0.775

Table 5  
(continued)

Q11: Goals	1.000	0.756
Q12: Objectives	1.000	0.751
Q13: Operational Budget	1.000	0.458

Principal component analysis was used because the primary purpose of Research Objective 1 was to identify factors necessary to support the implementation of career and technical education programs. The initial eigenvalues showed that the first factor explained 38.13% of the variance, the second factor 11.88% of the variance, the third 8.37% of the variance, and the fourth factor 7.85% of the variance. The fifth through thirteenth factor had a total value less than 1.00, each with a variance percent less than seven. The four factor solution, which explained 66.23% of the variance, was preferred because of its previous theoretical support, the dropping and then “leveling off” of eigenvalues on the scree plot after four factors, and the insufficient number of primary loadings and difficulty of interpreting the fifth factor and subsequent factors. Both varimax and oblimin rotations were completed and examined; however, there was little difference between the varimax and oblimin solutions, thus both solutions were examined in the subsequent analyses before deciding on an oblimin rotation for the final solution.

Internal consistency was examined using Cronbach’s alpha. Cronbach’s alpha for Research Objective 1 was 0.847. Composite scores were created for each factor, based on the mean of the items which had their primary loadings on each factor. Higher scores indicated greater importance. Teachers holding appropriate degrees and/or licenses for the courses taught ( $M=4.55$ ) was reported as the most important in implementing a

successful career and technical education program, followed by technical assessments have been established and are used within the district (M=4.42), a set sequence of rigorous courses that are relevant to the 16 national career clusters have been established (M=4.30) was listed next, and student organizations (M=4.23) were fourth. The least important factor for Research Objective 1 was career academies being established (M=3.33). Descriptive statistics are presented in Table 6.

Table 6

*Descriptive Statistics for Research Objective 1 (N=106)*

	<i>M</i>	<i>SD</i>
Q1: Teacher Degree	4.55	.706
Q2: Rigorous Courses	4.30	.783
Q3: Integration	3.79	.923
Q4: Work based	4.23	.887
Q5: Career Academies	3.33	1.177
Q6: Student Orgs	4.08	.885
Q7: Technical Assess	4.42	.815
Q8: Stud Support	4.23	.876
Q9: Counselors	3.91	.991
Q10: Mission	4.00	.840
Q11: Goals	4.21	.643
Q12: Objectives	4.06	.741
Q13: Operational Budget	4.09	.834

Next the factorability of the 13 items for Research Objective 2 was examined. Thirteen of the 13 items correlated at least 0.3 with at least one other item, suggesting reasonable factorability. The Kaiser-Meyer-Olkin measure of sampling adequacy was 0.740, above the recommended value of 0.5, and Bartlett's test of sphericity was significant ( $\chi^2(78) = 571.36, p < 0.05$ ). Principal component analysis requires that the probability associated with Bartlett's test of sphericity be less than the level of significance. The probability associated with the Bartlett test is  $<0.001$ , which satisfies this requirement. The diagonals of the anti-image correlation matrix were all over 0.5, supporting the inclusion of each item in the factor analysis. Finally, the communalities were all above 0.3 (see Table 7), further confirming that each item shared some common variance with other items. Given these overall indicators, factor analysis was conducted with all 13 items from Section 2 addressing Research Objective 2.

Table 7

*Communalities, Research Objective 2*

	Initial	Extraction
Q14: Articulation agreement	1.000	0.572
Q15: Dual enrollment	1.000	0.586
Q16: Local business collaboration	1.000	0.737
Q17: Credentialing	1.000	0.595
Q18: Workforce readiness	1.000	0.719
Q19: Collaboration	1.000	0.736
Q20: Advantage of articulation	1.000	0.694
Q21: CTE evaluation established	1.000	0.735

Table 7  
(continued)

Q22: CTE evaluated	1.000	0.832
Q23: Career pathways understood	1.000	0.659
Q24: Career pathways implemented	1.000	0.731
Q25: Tracking established	1.000	0.628
Q26: Marketing established	1.000	0.674

Principal component analysis was used because the primary purpose of Research Objective 2 was to identify factors necessary to facilitate the growth of career and technical education programs. The initial eigenvalues showed that the first factor explained 36.44% of the variance, the second factor 14.00% of the variance, the third 10.19% of the variance, and the fourth factor 7.81% of the variance. The fifth through thirteenth factor had a total value less than 1.00, each with a variance percent less than seven. The four factor solution, which explained 68.44% of the variance, was preferred because of its previous theoretical support, the dropping and “leveling off” of eigenvalues on the scree plot after four factors, and the insufficient number of primary loadings and difficulty of interpreting the fifth factor and subsequent factors. Both varimax and oblimin rotations were completed and examined; however, there was little difference between the varimax and oblimin solutions, thus both solutions were examined in the subsequent analyses before deciding on an oblimin rotation for the final solution.

Internal consistency was examined using Cronbach’s alpha. Cronbach’s alpha for Research Objective 2 was 0.851. Composite scores were created for each factor. Higher scores indicated greater importance. A district having a local and state articulation

agreement with community colleges and/or universities for courses offered ( $M=4.40$ ) was reported as important in the growth of a career and technical education program followed by collaboration with local community colleges and universities having been established ( $M=4.37$ ), students have access to industry credentialing exams ( $M=4.33$ ), and workforce readiness ( $M=4.24$ ) as the most significant factors. The least important factor for Research Objective 2 was students and parents understand and take advantage of the courses offered within the district that are articulated in state and local articulation agreements ( $M=3.66$ ). Descriptive statistics are presented in Table 8.

Table 8

*Descriptive Statistics for Research Objective 2 (N=106)*

	<i>M</i>	<i>SD</i>
Q14: Articulation agreement	4.40	.726
Q15: Dual enrollment	4.07	.854
Q16: Local business collaboration	4.13	.718
Q17: Credentialing	4.33	.686
Q18: Workforce readiness	4.24	.594
Q19: Collaboration	4.37	.540
Q20: Advantage of articulation	3.66	.872
Q21: CTE evaluation established	3.92	.782
Q22: CTE evaluated	3.87	.895
Q23: Career pathways understood	3.77	.843
Q24: Career pathways implemented	4.14	.786



Table 8  
(continued)

Q25: Tracking established	4.15	.802
Q26: Marketing established	3.75	.851

Lastly, the factorability of nine items for Research Objective 3 was examined. Nine of the 9 items correlated at least 0.3 with at least one other item, suggesting reasonable factorability. The Kaiser-Meyer-Olkin measure of sampling adequacy was 0.837, above the recommended value of 0.5, and Bartlett's test of sphericity was significant ( $\chi^2(36) = 309.28, p < 0.05$ ). Principal component analysis requires that the probability associated with Bartlett's test of sphericity be less than the level of significance. The probability associated with the Bartlett test is  $<0.001$ , which satisfies this requirement. The diagonals of the anti-image correlations matrix were all over 0.5, supporting the inclusion of each item in the factor analysis. Finally, the communalities were all above 0.3 (see Table 9), further confirming that each item shared some common variance with other items. Given these overall indicators, factor analysis was conducted with all 9 items from Section Three addressing Research Objective 3.

Table 9

*Communalities, Research Objective 3*

	Initial	Extraction
Q27: Professional Development	1.000	0.676
Q28: Equipment Provided	1.000	0.605
Q29: CTE Background	1.000	0.572
Q30: Strong leadership	1.000	0.637

Table 9  
(continued)

Q31: Resources sought	1.000	0.532
Q32: Information disseminated	1.000	0.556
Q33: Data used	1.000	0.646
Q34: Advisory committee	1.000	0.463
Q35: Funding secured	1.000	0.452

Principal component analysis was used because the primary purpose of Research Objective 3 was to identify factors necessary to sustain an effective career and technical education programs. The initial eigenvalues showed that the first factor explained 44.08% of the variance and the second factor 12.99% of the variance. The third through ninth factor had a total value under 1.00, each with a variance percent less than nine. The two factor solution, which explained 57.07% of the variance, was preferred because of its previous theoretical support, the dropping and then “leveling off” of eigenvalues on the scree plot after two factors, and the insufficient number of primary loadings and difficulty of interpreting the third factor and subsequent factors. Both varimax and oblimin rotations were completed and examined; however, there was little difference between the varimax and oblimin solutions, thus both solutions were examined in the subsequent analyses before deciding on an oblimin rotation for the final solution.

Internal consistency was examined using Cronbach’s alpha. Cronbach’s alpha for Research Objective 3 was 0.834. Composite scores were created for each factor, based on the mean of the items which had their primary loadings on each factor. Higher scores indicated greater importance. The most significant factors to sustain effective career and

technical education programs included instructors are provided opportunities for continued professional development ( $M=4.47$ ) and the second significant factor was teachers have the equipment and technology recommended to support teaching of career and technical education courses ( $M=4.36$ ). The least significant factor to sustain an effective career and technical education program, based on data collected, was an advisory committee for career and technical education being established ( $M=3.78$ ). Descriptive statistics are presented in Table 10.

Table 10

*Descriptive Statistics for Research Objective 3 (N=106)*

	<i>M</i>	<i>SD</i>
Q27: Professional Development	4.47	.573
Q28: Equipment Provided	4.36	.771
Q29: CTE Background	4.21	1.021
Q30: Strong leadership	4.35	.769
Q31: Resources sought	4.26	.590
Q32: Information disseminated	3.84	.758
Q33: Data used	4.20	.709
Q34: Advisory committee	3.78	.936
Q35: Funding secured	4.16	.588

Correlations were then analyzed. These statistical analyses provide the correlation coefficients between a single variable and every other variable in the study thereby providing one with the greatest correlations among questions on the survey for each research objective. Significant correlations were those identified as being closest to

1.00. The correlations presented in Section 1 were between support of students during course selection and counselors ability to provide the benefits of CTE program, establishing a mission and establishing goals, and establishing goals and establishing objectives. The correlations presented in Section 2 included the importance of collaboration between CTE programs and local business, industry, and community college, providing opportunities for industry credentialing exams and workforce readiness skills, establishing program evaluations and regularly evaluating the program, and regularly evaluating the program and tracking course completers. The correlations presented in Section 3 include having administrators with a CTE background and strong leadership and strong leadership and the importance of disseminating information to all CTE stakeholders. These correlations prove significant in this study because they indicate possible relationships amongst factors which would be necessary in sustaining effective CTE programs. In other words, these correlations indicate the interconnectivity of factors and the importance of having both factors to sustain a program.

The greatest correlations for Section 1 were between Questions 8 and 9, Questions 10 and 11, and Questions 11 and 12. Question 8 addressed support and guidance for students during course selection and Question 9 addressed counselors advising on the benefits of career and technical education. The correlation was 0.760 indicating a strong correlation amongst these factors. Question 10 addressed career and technical education programs establishing a mission, and Question 11 addressed the career and technical education program establishing goals. The correlation was 0.617 indicating a strong correlation amongst these factors. Question 11 addressed career and technical education programs establishing goals, and Question 12 addressed career and

technical education programs establishing objectives. The correlation was 0.774 indicating a strong correlation amongst these factors.

The greatest correlations among questions in Section 2 were between Questions 16 and 19, Questions 17 and 18, Questions 21 and 22, and Questions 22 and 25. Question 16 addressed collaboration with local business and industry being establishing, and Question 19 addressed collaborations with local community colleges and universities having been established. The correlation was 0.56, indicating a moderate correlation amongst these factors. Question 17 addressed students having access to industry credentialing exams, and Question 18 addressed workforce readiness skills being identified and incorporated into career and technical education course offerings. The correlation was 0.624, indicating a strong correlation amongst these factors. Question 21 addressed the district establishing a method to evaluate career and technical education program, and Question 22 addressed the district evaluates the program on a regular basis. The correlation was 0.718, indicating a strong correlation amongst these factors. Lastly, Question 22 addressed a district evaluating the program on a regular basis, and Question 25 addressed the district established guidelines for tracking course completers. The correlation was 0.611, indicating a strong correlation amongst these factors.

The greatest correlations among questions in Section 3 were between Questions 29 and 30 and Questions 30 and 31. Question 29 addressed program administrators having a background in career and technical education, and Question 30 addressed strong leadership in place at the state and local level with an understanding of career and technical education. The correlation was 0.598, indicating a moderate correlation amongst these factors. Question 30 addressed strong leadership in place at the state and

local level with an understanding of career and technical education, and Question 31 addressed information being disseminated to all stakeholders on a regular basis to provide updates and feedback. The correlation was 0.550, indicating a moderate correlation amongst these factors.

### **SUMMARY**

The problem of this study was to identify components needed for the design of a sustainable career and technical education program. The researcher collected demographic information along with the degree to which specified factors contribute to a sustainable career and technical education program.

Of the 115 surveys e-mailed to participants, 106 completed the survey for a return rate of 92.17%. All surveys were completed online. Surveys were completed by local education agencies (LEAs) also referred to as school district Career and Technical Education Directors. The largest segment of participants who completed the survey have 0-4 years of experience in CTE, 57 individuals (54%), while the largest segment of those participating in the survey have fewer years of experiences as CTE Directors: 0-9 years of experience for 89 individuals (84%) and most work in a rural area, 72 (68%).

The study included three research objectives which addressed factors of effective CTE programs, factors that facilitate growth of CTE programs, and factors that are necessary to sustain CTE programs. The researcher analyzed data to find the number, percentage, and mean for each question. A factor analysis was then employed for RO<sub>1</sub>, RO<sub>2</sub>, and RO<sub>3</sub>. The factor analysis included results from the correlation matrix and Kaiser-Meyer-Olkin (KMO) and Bartlett's Test. Lastly, a reliability analysis was completed.

RO<sub>1</sub> addressed factors of effective CTE programs. The most significant factors were teachers holding appropriate degrees and/or licenses for the courses taught (M=4.55), technical assessments have been established and are used within the district (M=4.42), a set sequence of rigorous courses that are relevant to the 16 national career clusters have been established (M=4.30), and career and technical education student organizations have been established and are active (M=4.23). The Kaiser-Meyer-Olkin measure of sampling adequacy was 0.773, above the recommended value of 0.5, and Bartlett's test of sphericity was significant ( $\chi^2 (78) = 585.45, p < 0.05$ ).

RO<sub>2</sub> addressed factors that facilitate the growth of CTE programs. Based on factor analysis, the most significant factors were a district having a local and state articulation agreement with community colleges and/or universities for courses offered (M=4.40), collaboration with local community colleges and universities having been established (M=4.37), students have access to industry credentialing exams (M=4.33), and workforce readiness skills have been identified and incorporated into career and technical education course offerings (M=4.24). The Kaiser-Meyer-Olkin measure of sampling adequacy was 0.740, above the recommended value of 0.5, and Bartlett's test of sphericity was significant ( $\chi^2 (78) = 571.36, p < 0.05$ ).

RO<sub>3</sub> addressed factors necessary to sustain an effective CTE program. Based on factor analysis, the most significant factors were instructors are provided opportunities for continued professional development (M=4.47) and teachers have the equipment and technology recommended to support teaching of career and technical education courses (M=4.36). The Kaiser-Meyer-Olkin measure of sampling adequacy was 0.837, above the

recommended value of 0.5, and Bartlett's test of sphericity was significant ( $\chi^2 (36) = 309.28, p < 0.05$ ).

Correlations were also reported. Correlations were found among Questions 8 and 9, 10 and 11, and 11 and 12 in Section 1. These questions addressed support and guidance provided by counselors and the establishment of goals and objectives. In Section 2, correlations were found among Questions 16 and 19, 17 and 18, 21 and 22, and 22 and 25. These questions addressed students having access to industry credentialing exams and workforce readiness skills, establishing and using an evaluation tool, and tracking course completers. Correlations were found among Questions 29 and 30 and 30 and 31 in Section 3. These questions addressed administrators having a background in CTE and strong leadership and an understanding of CTE and information being disseminated to all stakeholders. Chapter V includes a Summary, Conclusions, and Recommendations based upon these findings.



## **CHAPTER V**

### **SUMMARY, CONCLUSIONS, AND RECOMMENDATIONS**

This study examined factors necessary to sustain an effective career and technical education program. This chapter summarizes the study, presents conclusions based upon the findings, and provides recommendations for future studies based upon the results of this study.

#### **SUMMARY**

The purpose of this study was to identify components needed for the design of a sustainable career and technical education program. Three research objectives were used to guide this study. They included to:

RO<sub>1</sub>: Determine the factors that support the implementation of a career and technical education program.

RO<sub>2</sub>: Determine factors that facilitate the growth of career and technical education programs.

RO<sub>3</sub>: Determine factors necessary to sustain an effective career and technical education program.

The problem is significant due to economic issues faced by society and their recent impacts on career and technical education programs. Through this study the researcher was able to provide readers with the benefits of an effective career and technical education program which could be used to justify the importance of such programs not just to students, but to all stakeholders involved.

There were several limitations to this study. First, because survey responses only depict opinions of career and technical education directors, perceptions relating to the

factors which are effective in sustaining and developing a career and technical education program may differ among teachers, administrators, and other stakeholders. Second, because this study was completed in North Carolina, one does not know if career and technical education programs in other states would yield similar results. Third, conceptually, career and technical education has various meanings based on one's program. Thus career and technical education has been defined in this study as vocational education or workforce development education and includes programs such as agriculture, business and information technology, career development, family and consumer science, health occupations, marketing, technology, and trade and industrial education (Career and Technical Education, 2009). Finally, theoretically, the concept of sustainability has various meanings. Thus sustainability has been defined in this study as the ability of a program, specifically a career and technical education program, to endure or continue operation. Sustainability is the likelihood of a program to continuously regenerate itself in an ever-improving direction (Fullan, 2002).

The population of this study consisted of 115 career and technical education directors in the state of North Carolina. One director from each of the 115 LEA's (local education agencies) or districts was selected to participate in this study. The directors were divided among eight education regions including Northeast, Southeast, North Central, South Central, Central, Northwest, Southwest, and Western.

The procedure for data collection for this study was a survey containing 35 closed-form questions and an open-form question. The closed-form questions were Likert scaled questions. The questions were designed and developed from the research goals and professional literature to seek the answer to the researcher's problem under

study. After development, the survey was pilot tested for validity with content experts and then a second time for reliability with a group of career and technical education directors from the North Carolina Department of Public Instruction. The survey was then revised and administered to career and technical education directors in North Carolina during the fall of 2011-2012, specifically in December and January. Surveys were administered via e-mail that had a link to allow directors to respond. Follow-up e-mails with the link were sent to those who had not participated on two occasions, seven days after the initial e-mail and once again approximately two weeks later. The responses were then analyzed. Of the 115 (N=115), 106 surveys were completed and returned for a return rate of 92.17%.

To address research objectives, descriptive statistical analysis was employed to describe data from the survey. Number of responses, percentages, and means were calculated to determine the total number of respondents' selections based on the Likert scale choices. Factor analysis, specifically Kaiser-Meyer-Olkin (KMO) and Bartlett's Test, and a reliability analysis were also completed using SPSS.

## **CONCLUSIONS**

The following conclusions were drawn after analyzing the findings as they relate to the research objectives. Research Objective 1 was to determine the factors that support the implementation of a career and technical education program. Analysis confirmed that the most significant factors were teachers holding appropriate degrees and/or licenses for the courses taught (M=4.55), technical assessments have been established and are used within the district (M=4.42), a set sequence of rigorous courses that are relevant to the 16

national career clusters have been established (M=4.30), and career and technical education student organizations have been established and are active (M=4.23).

Research Objective 2 was to determine factors that facilitate the growth of career and technical education programs. Analysis confirmed that the most significant factors were a district having a local and state articulation agreement with community colleges and/or universities for courses offered (M=4.40), collaboration with local community colleges and universities having been established (M=4.37), students have access to industry credentialing exams (M=4.33), and workforce readiness skills have been identified and incorporated into career and technical education course offerings (M=4.24).

Research Objective 3 was to determine factors necessary to sustain an effective career and technical education program. The most significant factors were instructors are provided opportunities for continued professional development (M=4.47) and teachers have the equipment and technology recommended to support teaching of career and technical education courses (M=4.36).

These conclusions confirmed current research addressing the need of strong leadership and support, articulation and collaboration among colleges and universities, the need for well-equipped classrooms and teachers, and the establishment of planning, goals, and evaluation to sustain career and technical education programs. According to the Southern Regional Education Board and High Schools that Work (2009), attributes of effective career and technical education programs include strong leadership, a plan for continuous improvement, quality teachers and support for teachers, courses that meet the needs of the local community, and support for professional development. Wilcox (2006)

explains, “The appeal of industry-based certifications emerges from a continuing need to prove relevance and impact” (p. 21). These needs include program relevancy, consistency of results, accountability, nationally portable credentials, control educational costs, and coherent programs of study.

Furthermore, the factor analysis provided the researcher with strong correlations among student support during course selections and having a knowledgeable counselor, having established goals and objectives, collaboration established among business and industry and college and universities and workforce readiness skills and program administrators with a career and technical education background and having strong leadership in place. These correlations provide evidence of the importance of the most significant factors found in sustaining career and technical education programs.

### **RECOMMENDATIONS**

Brown (2003) stated, “High quality career and technical education (CTE) programs prepare students for occupations and careers in demand” (p. 15); therefore, effective career and technical education programs that are also sustained for future generations are important for society. Based upon the findings of this study the following recommendations are offered:

1. This study addressed the perceptions of career and technical education directors.

Further research gaining the perceptions of teachers, administrators, and business leaders would prove beneficial and add to the richness of career and technical education. This could be accomplished through conference presentation and national publications. Gaining perceptions from leaders is important and can further validate the findings of this study. According to the National Governors

Association (2007), providing leadership to strengthen state policies and improve education coordination across systems can improve the outcome for both students and the workforce. Creating a more inclusive list of factors that contribute to the sustainability of career and technical education programs using data analysis from this study and data from a study including teachers, administrators, and business leaders would be recommended.

2. Based on factors identified in this study as significant, a self-assessment instrument should be designed that can be used by schools and/or teachers to evaluate their individual career and technical education programs to determine if they are supporting effective and sustainable career and technical education programs.
3. To expand this study and provide further support to the factors identified and deemed significant, further research should be conducted on successful/unsuccessful or sustainable/non-sustained career and technical education programs. The list of factors derived from this study should guide this research through direct teacher observations or focus group discussion with these teachers.
4. Gaining a better understanding of the impact of counselors on student enrollment in career and technical education courses would be beneficial. Based on the data collected from this study, 89 individuals (84%) agreed or strongly agreed that students are provided guidance during course selection which includes their options to take career and technical education courses and 81 individuals (76%) agreed or strongly agreed that counselors can advise on the benefits of career and

technical education and aid students in course and program selection. It would be recommended that students be surveyed to gain their perceptions on the aid they received during course selection and the benefit, if any, from school counselors.

5. Because this study was completed in North Carolina, one does not know if career and technical education programs in other states would yield similar results. For this reason, it is recommended that this study be replicated to gain the perceptions of each state career and technical education director. The current study can be used to evaluate current career and technical education programs in North Carolina and be used in making recommendations on how to sustain effective programs; however, with the addition of this recommended study, programs across the United States could be evaluated for sustainability as the factors included in this study were North Carolina specific.
6. Based on the data collected from this study, 79 individuals (75%) agreed or strongly agreed that integration of career and technical education and core standards should occur. Research is needed on the perceptions of the degree to which this occurs and if both non-career and technical education teachers and career and technical education teachers believe this occurs, and if so, to what extent and to what degree of effectiveness. Kendall (2006) explains that "...integrating CTE into all disciplines and education levels can support improved student achievement overall by making what students are learning in their academic subjects relevant to the world of work" (p. 15).
7. Return on investment of marketing and career and technical education completers would be a recommended study by the researcher. Eighty-two (77%) individuals

in this study agreed or strongly agreed that information should be disseminated to all stakeholders – students, parents, administrators, and community and business leaders – on a regular basis (at a minimum once a year) to provide updates and feedback, and 69 individuals (65%) agreed or strongly agreed that a district should establish program marketing and public relations strategies to sustain effective career and technical education programs.

8. Lastly, the researcher would recommend that research be completed on the effectiveness of having a local and state articulation agreement and the perception of collaboration among teachers, students, career and technical education programs, and community colleges, universities, and businesses. As an extension, the perception of parents on the importance of this collaboration could prove insightful. Ninety-nine (93%) participants agreed or strongly agreed that a district should have a local and state articulation agreement with community colleges and/or universities for courses offered, and 103 individuals (98%) agreed or strongly agreed that collaboration with local community colleges and universities be established to create an effective sustainable career and technical education program.



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## APPENDIX A

### Initial Career and Technical Education Director Survey (Before Pilot Study)

#### COMPONENTS NEEDED FOR THE DESIGN OF A SUSTAINABLE CAREER AND TECHNICAL EDUCATION PROGRAM

**Purpose:** The problem of this study will be to identify components needed for the design of a sustainable career and technical education program. Through this study the researcher hopes to determine (1) the factors that support an effective career and technical education program, (2) factors that facilitate the growth of career and technical education programs, and (3) factors necessary to sustain an effective career and technical education program.

**Directions:** Please respond to each question by clicking the appropriate number on the 5-point Likert scale, from Strongly Disagree (1) to Strongly Agree (5). The data collected from this study will be confidential. Thank you for your help!

#### Section I: Factors of Effective CTE Programs

1. There is a set sequence of rigorous courses (courses that have been identified and standards are adhered to) that are relevant to specific career clusters that combines academic and technical concepts and skills.

- 1 Strongly Disagree
- 2 Disagree
- 3 Neither Disagree or Agree
- 4 Agree
- 5 Strongly Agree

2. Integration of career and technical education and core standards occur in your district.

- 1 Strongly Disagree
- 2 Disagree
- 3 Neither Disagree or Agree
- 4 Agree
- 5 Strongly Agree

3. Work-based learning, such as co-op and internship programs, has been established.

- 1 Strongly Disagree
- 2 Disagree
- 3 Neither Disagree nor Agree
- 4 Agree
- 5 Strongly Agree

4. Career academies have been established.

- 1 Strongly Disagree
- 2 Disagree
- 3 Neither Disagree nor Agree
- 4 Agree
- 5 Strongly Agree

5. Career and technical education student organizations have been established and are active (i.e., student organizations meet throughout the year to plan, discuss, and implement projects).

- 1 Strongly Disagree
- 2 Disagree
- 3 Neither Disagree nor Agree
- 4 Agree
- 5 Strongly Agree

6. Technical assessments have been established and are used within the district.

- 1 Strongly Disagree
- 2 Disagree
- 3 Neither Disagree nor Agree
- 4 Agree
- 5 Strongly Agree

7. Students are provided support and guidance during course selection which includes their options to take career and technical education courses.

- 1 Strongly Disagree
- 2 Disagree
- 3 Neither Disagree nor Agree
- 4 Agree
- 5 Strongly Agree

8. Counselors can advise on the benefits of career and technical education and aid students in course and program selection.

- 1 Strongly Disagree
- 2 Disagree
- 3 Neither Disagree nor Agree
- 4 Agree
- 5 Strongly Agree

9. The district has a local and state articulation agreement for courses offered.

- 1 Strongly Disagree
- 2 Disagree
- 3 Neither Disagree nor Agree
- 4 Agree
- 5 Strongly Agree

10. Dual enrollment opportunities have been established and are offered as course possibilities.

- 1 Strongly Disagree
- 2 Disagree
- 3 Neither Disagree nor Agree
- 4 Agree
- 5 Strongly Agree

11. The district has established a mission for the career and technical education program.

- 1 Strongly Disagree
- 2 Disagree
- 3 Neither Disagree nor Agree
- 4 Agree
- 5 Strongly Agree

12. The district has established goals for the career and technical education program.

- 1 Strongly Disagree
- 2 Disagree
- 3 Neither Disagree nor Agree
- 4 Agree
- 5 Strongly Agree

13. The district has established objectives for the career and technical education program.

- 1 Strongly Disagree
- 2 Disagree
- 3 Neither Disagree nor Agree
- 4 Agree
- 5 Strongly Agree

**Section II: Factors that Facilitate the Growth of CTE Programs**

14. Collaborations with local business and industry have been established.

- 1 Strongly Disagree
- 2 Disagree
- 3 Neither Disagree nor Agree
- 4 Agree
- 5 Strongly Agree

15. Workforce readiness skills have been identified and incorporated into career and technical education course offerings.

- 1 Strongly Disagree
- 2 Disagree
- 3 Neither Disagree nor Agree
- 4 Agree
- 5 Strongly Agree

16. Collaborations with local community colleges and universities have been established.

- 1 Strongly Disagree
- 2 Disagree
- 3 Neither Disagree nor Agree
- 4 Agree
- 5 Strongly Agree

17. Students and parents understand and take advantage of the courses offered within your district that are articulated in state and local articulation agreements.

- 1 Strongly Disagree
- 2 Disagree
- 3 Neither Disagree nor Agree
- 4 Agree
- 5 Strongly Agree

18. Instructors are provided opportunities for continued professional development (i.e., professional development is offered to instructors at a minimum yearly).

- 1 Strongly Disagree
- 2 Disagree
- 3 Neither Disagree nor Agree
- 4 Agree
- 5 Strongly Agree

19. The district has established a method to evaluate the career and technical education program.

- 1 Strongly Disagree
- 2 Disagree
- 3 Neither Disagree nor Agree
- 4 Agree
- 5 Strongly Agree

20. The district evaluates the career and technical education program on a regular basis (i.e., at a minimum once a year).

- 1 Strongly Disagree
- 2 Disagree
- 3 Neither Disagree nor Agree
- 4 Agree
- 5 Strongly Agree

21. Career pathways are available within the school system and understood by teachers.

- 1 Strongly Disagree
- 2 Disagree
- 3 Neither Disagree nor Agree
- 4 Agree
- 5 Strongly Agree

22. The district implements career pathways.

- 1 Strongly Disagree
- 2 Disagree
- 3 Neither Disagree nor Agree
- 4 Agree
- 5 Strongly Agree

23. The district has established guidelines for tracking course completers.

- 1 Strongly Disagree
- 2 Disagree
- 3 Neither Disagree nor Agree
- 4 Agree
- 5 Strongly Agree

24. The district has established program marketing and public relations strategies.

- 1 Strongly Disagree
- 2 Disagree
- 3 Neither Disagree nor Agree
- 4 Agree
- 5 Strongly Agree

**Section III: Factors Necessary to Sustain an Effective CTE Program**

25. Teachers hold appropriate degrees and/or licenses for the courses taught.

- 1 Strongly Disagree
- 2 Disagree
- 3 Neither Disagree nor Agree
- 4 Agree
- 5 Strongly Agree

26. Teachers have the equipment and technology recommended to support teaching of career and technical education courses.

- 1 Strongly Disagree
- 2 Disagree
- 3 Neither Disagree nor Agree
- 4 Agree
- 5 Strongly Agree

27. The program administrator has a background in career and technical education and understands the importance of the program to the district.

- 1 Strongly Disagree
- 2 Disagree
- 3 Neither Disagree nor Agree
- 4 Agree
- 5 Strongly Agree

28. Strong leadership is in place at the state and local level with an understanding of and support for career and technical education programs.

- 1 Strongly Disagree
- 2 Disagree
- 3 Neither Disagree nor Agree
- 4 Agree
- 5 Strongly Agree

29. Resources and support are continually being sought.

- 1 Strongly Disagree
- 2 Disagree
- 3 Neither Disagree nor Agree
- 4 Agree
- 5 Strongly Agree

30. Information is disseminated to all stakeholders – students, parents, administrators, and community and business leaders – on a regular basis (at a minimum once a year) to provide updates and feedback.

- 1 Strongly Disagree
- 2 Disagree
- 3 Neither Disagree nor Agree
- 4 Agree
- 5 Strongly Agree

31. Data from technical assessments are used in decision-making.

- 1 Strongly Disagree
- 2 Disagree
- 3 Neither Disagree nor Agree
- 4 Agree
- 5 Strongly Agree

32. An advisory committee for career and technical education has been established.

- 1 Strongly Disagree
- 2 Disagree
- 3 Neither Disagree nor Agree
- 4 Agree
- 5 Strongly Agree

33. Funding has been secured and is continually being sought.

- 1 Strongly Disagree
- 2 Disagree
- 3 Neither Disagree nor Agree
- 4 Agree
- 5 Strongly Agree

34. Please list any comment you would like to add about your career and technical education program that you believe is a factor in helping sustain and grow your program.

### Section VI: Demographic Information

35. Your years of experience in CTE: \_\_\_\_\_ 0-4 yrs. \_\_\_\_\_ 5 – 9 yrs  
 \_\_\_\_\_ 10-14 yrs \_\_\_\_\_ 15-19 yrs.  
 \_\_\_\_\_ 20 + yrs.

36. Your years of experience as a CTE Director: \_\_\_\_\_ 0-4 yrs. \_\_\_\_\_ 5 – 9 yrs  
 \_\_\_\_\_ 10-14 yrs \_\_\_\_\_ 15-19 yrs.  
 \_\_\_\_\_ 20 + yrs.

37. Geographic Description of your district (U.S. Department of Justice, 2008):

\_\_\_\_\_ Rural (a locale with a density less than 500 people per square mile and more than 30 miles from an urban area)

\_\_\_\_\_ Suburban (a locale no more than 30 miles from an urban area or with a density greater than or equal 500 people per square mile and less than 2,000 people per square mile)

\_\_\_\_\_ Urban (a locale with a density greater than or equal to 2,000 people per square mile or a place that has a total population greater than or equal to 100,000 people)

38. List the percentage of students in your district who receive free and/or reduced lunch.  
 \_\_\_\_\_ %



## **APPENDIX B**

### **Letter to Expert Group Participants**

October 31<sup>st</sup>, 2011

Dear Career and Technical Education Program Expert:

You are invited to participate in a research pilot study to assess the validity of a survey to be used in my dissertation research. The problem of this study is to identify components needed for the design of a sustainable career and technical education program. There are three research objectives. RO<sub>1</sub> seeks factors that support an effective career and technical education program, RO<sub>2</sub> seeks factors that facilitate growth of career and technical education programs, and RO<sub>3</sub> seeks factors necessary to sustain an effective career and technical education program.

The purpose of this pilot study is to gain feedback from subject matter experts working in the field of career and technical education. Your experience will provide valuable insight regarding the content validity of this research instrument. This study is being conducted in partial fulfillment of the requirements in the attainment of a doctoral degree at Old Dominion University in Norfolk, Virginia.

Your participation in this survey is completely voluntary and all responses will be held confidential. Furthermore, no personal information will be collected. By completing and returning the survey you are showing your willingness to participate. Attached you will find the survey instrument, research question concept matrix, and a survey rating sheet.

Please return all material via e-mail to [vlass002@odu.edu](mailto:vlass002@odu.edu) or mail it to me at 622 Yeopim Road, Edenton, NC 27932. Thank you in advance for participating and contributing to the success of my research!

Sincerely,

Vann M. Lassiter, M.Ed.  
Ph.D. Candidate, Occupational & Technical Education  
Old Dominion University  
Norfolk, Virginia

John M. Ritz, Ed.D.  
Professor  
Old Dominion University  
Norfolk, Virginia

## APPENDIX C

### Initial Research Objective Concept Matrix (Before Pilot Study)

Key Construct(s)	Variable(s)	Supporting Literature
RO <sub>1</sub> : Factors that support an effective career and technical education program	Sequence of rigorous coursework	Driscoll (2004); Arizona Department of Education (2011); Klein (2010); Minnesota Department of Education (2006)
	Integration of career and technical education and core subjects	Association of Career and Technical (2006)
	Work-based learning experiences	Driscoll (2004); Kendall (2006); NC Department of Public Instruction (2009); Arizona Department of Education (2011)
	Career academies	Sarkees-Wircenski (2004)
	Student organizations	Student Organizations (2010); Career and Technical Education (2010)
	Technical assessments	North Carolina CTE State Profile (2009); US Department of Education (2006)
	Support and guidance during registration	Huss (2001); Context and Change (2001); National Governors Association (2007)
	Counselors can advise on the benefits of CTE and aid students in course selection	Huss (2001)

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	Local and state articulation agreement	US Department of Education Office of Vocational and Adult Education (2006); North Carolina CTE State Profile (2009)
	Dual enrollment opportunities have been established and are offered as course possibilities	National Research Center (2010); Clark (2001); Bailey & Karp (2003)
	Established goals, objectives, and a mission	US Department of Education Office of Vocational and Adult Education (2006)

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RO <sub>2</sub> : Factors that facilitate the growth of career and technical education programs	Collaboration with local business and industry	NC Department of Public Instruction (2009); US Department of Education Office of Vocational and Adult Education (2006)
	Workforce readiness skills have been identified and incorporated into CTE course offerings	Sarkees-Wircenski (2004)
	Collaboration with local community colleges and universities	Silverberg (2004); US Department of Education Office of Vocational and Adult Education (2006)
	Students and parents understand the advantages of articulated courses being offered	Klein (2010); Silverberg (2004)
	Professional development for instructors	Klein (2010); Silverberg (2004)
	A method for program evaluation	Klein (2010); Silverberg (2004); US Department of

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		Education Office of Vocational and Adult Education (2006)
	District evaluates program on a regular basis	Arizona Department of Education (2011); Klein (2010); Silverberg (2004); US Department of Education Office of Vocational and Adult Education (2006)
	Career pathways are available within the school system and are understood by teachers	NC Career Clusters (2009)  Klein (2010); Silverberg (2004)
	Guidelines are established for tracking completers	Klein (2010); Silverberg (2004)
	Program marketing strategies are in place	
RO <sub>3</sub> : Factors necessary to sustain an effective career and technical education program.	Teachers hold appropriate degrees and licenses	Klein (2010); Silverberg (2004); US Department of Education Office of Vocational and Adult Education (2006)
	Equipment and technology recommended for teaching are present	Klein (2010); NC Department of Public Instruction (2009); Silverberg (2004)
	Program administrator has a background in CTE	Klein (2010); Silverberg (2004)
	Strong leadership is in place at the state and local level who understand and support CTE	National Governors Association (2007)
	Resources and support are sought	Klein (2010); Minnesota Department of Education (2006);

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	NC Department of Public Instruction (2009)
Information is disseminated to all stakeholders	Arizona Department of Education (2011); Klein (2010); Silverberg (2004)
Data from technical assessments are used in decision-making	Arizona Department of Education (2011); Klein (2010); Silverberg (2004)
An advisory committee has been established	Klein (2010); Silverberg (2004); US Department of Education Office of Vocational and Adult Education (2006)
Funding has been secured and is continually sought	Reese (2002); Driscoll (2004)

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## APPENDIX D

### Validity Pilot Study Instrument Checklist

#### COMPONENTS NEEDED FOR THE DESIGN OF A SUSTAINABLE CAREER AND TECHNICAL EDUCATION PROGRAM

**Directions:** Please use the following checklist to evaluate the attached survey that will be used in this research study. There are two types of questions, open- and closed-form questions. Using the scale of 1 (strongly disagree) to 5 (strongly agree), place an X on the blank that corresponds to your answer to respond to the closed-form questions. You are also welcome to include any additional comments, suggestions, and/or feedback that will add to the effectiveness in measuring the research objectives. **If you have ideas about missing concepts in the survey, please write your comments directly on the survey.**

1. The survey meets the data collection needs of the study as defined by the problem statement and research objectives.

- \_\_\_\_\_ 1 - Strongly Disagree
- \_\_\_\_\_ 2 - Disagree
- \_\_\_\_\_ 3 - Neither Agree nor Disagree
- \_\_\_\_\_ 4 - Agree
- \_\_\_\_\_ 5 - Strongly Agree

Comments:

2. The directions for completing the survey were clearly stated.

- \_\_\_\_\_ 1 - Strongly Disagree
- \_\_\_\_\_ 2 - Disagree
- \_\_\_\_\_ 3 - Neither Agree nor Disagree
- \_\_\_\_\_ 4 - Agree
- \_\_\_\_\_ 5 - Strongly Agree

Comments:

3. The survey questions and/or statements in Section I (addressing RO<sub>1</sub>) were clear and addressed the variables for this construct. If not, please list under comments or indicate on the survey areas for improvement and/or additions that can be added to the survey.

- \_\_\_\_\_ 1 - Strongly Disagree
- \_\_\_\_\_ 2 - Disagree
- \_\_\_\_\_ 3 - Neither Agree nor Disagree
- \_\_\_\_\_ 4 - Agree
- \_\_\_\_\_ 5 - Strongly Agree

Comments:

4. The survey questions and/or statements in Section II (addressing RO<sub>2</sub>) were clear and addressed the variables for this construct. If not, please list under comments or indicate on the survey areas for improvement and/or additions that can be added to the survey.

- \_\_\_\_\_ 1 - Strongly Disagree
- \_\_\_\_\_ 2 - Disagree
- \_\_\_\_\_ 3 - Neither Agree nor Disagree
- \_\_\_\_\_ 4 - Agree
- \_\_\_\_\_ 5 - Strongly Agree

Comments:

5. The survey questions and/or statements in Section III (addressing RO<sub>3</sub>) were clear and addressed the variables for this construct. If not, please list under comments or indicate on the survey areas for improvement and/or additions that can be added to the survey.

- \_\_\_\_\_ 1 - Strongly Disagree
- \_\_\_\_\_ 2 - Disagree
- \_\_\_\_\_ 3 - Neither Agree nor Disagree
- \_\_\_\_\_ 4 - Agree
- \_\_\_\_\_ 5 - Strongly Agree

Comments:

6. There are no grammatical and/or spelling errors. If so, please list under comments or indicate on the survey.

- \_\_\_\_\_ 1 - Strongly Disagree
- \_\_\_\_\_ 2 - Disagree
- \_\_\_\_\_ 3 - Neither Agree nor Disagree
- \_\_\_\_\_ 4 - Agree
- \_\_\_\_\_ 5 - Strongly Agree

Comments:

***Thank you for completing this checklist and contributing to the success of this research study!***



## APPENDIX E

### Revised Survey (After Pilot Test)

#### COMPONENTS NEEDED FOR THE DESIGN OF A SUSTAINABLE CAREER AND TECHNICAL EDUCATION PROGRAM

**Purpose:** The problem of this study will be to identify components needed for the design of a sustainable career and technical education program. Through this study the researcher hopes to determine (1) the factors that support the implementation of a career and technical education program, (2) factors that facilitate the growth of career and technical education programs, and (3) factors necessary to sustain an effective career and technical education program.

**Directions:** Please respond to each question by clicking the appropriate number on the 5-point Likert scale, from Strongly Disagree (1) to Strongly Agree (5). The data collected from this study will be confidential. Thank you for your help!

#### **Section I: Factors of Implementation of a CTE Programs**

1. Teachers hold appropriate degrees and/or licenses for the courses taught.

- 1 Strongly Disagree
- 2 Disagree
- 3 Neither Disagree nor Agree
- 4 Agree
- 5 Strongly Agree

2. There is a set sequence of rigorous courses (courses that have been identified and standards are adhered to) that are relevant to the 16 national career clusters that combines academic and technical concepts and skills.

- 1 Strongly Disagree
- 2 Disagree
- 3 Neither Disagree nor Agree
- 4 Agree
- 5 Strongly Agree

3. Integration of career and technical education and core standards occur in your district.

- 1 Strongly Disagree
- 2 Disagree
- 3 Neither Disagree nor Agree
- 4 Agree
- 5 Strongly Agree

4. Work-based learning, opportunities for students to see how classroom instruction connects to the world of work through hands-on application, has been established in your district (i.e., co-op, internships, co-curricular organization involvement, job shadowing, field trips, and/or service learning).

- 1 Strongly Disagree
- 2 Disagree
- 3 Neither Disagree nor Agree
- 4 Agree
- 5 Strongly Agree

5. Career academies, learning communities focused on a specific career cluster or pathway, have been established.

- 1 Strongly Disagree
- 2 Disagree
- 3 Neither Disagree nor Agree
- 4 Agree
- 5 Strongly Agree

6. Career and technical education student organizations have been established and are active (i.e., student organizations meet throughout the year to plan, discuss, and implement projects).

- 1 Strongly Disagree
- 2 Disagree
- 3 Neither Disagree nor Agree
- 4 Agree
- 5 Strongly Agree

7. Technical assessments have been established and are used within the district.

- 1 Strongly Disagree
- 2 Disagree
- 3 Neither Disagree nor Agree
- 4 Agree
- 5 Strongly Agree

8. Students are provided support and guidance during course selection which includes their options to take career and technical education courses.

- 1 Strongly Disagree
- 2 Disagree
- 3 Neither Disagree nor Agree
- 4 Agree
- 5 Strongly Agree

9. Counselors can advise on the benefits of career and technical education and aid students in course and program selection.

- 1 Strongly Disagree
- 2 Disagree
- 3 Neither Disagree nor Agree
- 4 Agree
- 5 Strongly Agree

10. The district has established a mission for the career and technical education program.

- 1 Strongly Disagree
- 2 Disagree
- 3 Neither Disagree nor Agree
- 4 Agree
- 5 Strongly Agree

11. The district has established goals for the career and technical education program.

- 1 Strongly Disagree
- 2 Disagree
- 3 Neither Disagree nor Agree
- 4 Agree
- 5 Strongly Agree

12. The district has established objectives for the career and technical education program.

- 1 Strongly Disagree
- 2 Disagree
- 3 Neither Disagree nor Agree
- 4 Agree
- 5 Strongly Agree

13. An operating budget has been established to fund adequate facilities and equipment.

- 1 Strongly Disagree
- 2 Disagree
- 3 Neither Disagree nor Agree
- 4 Agree
- 5 Strongly Agree

**Section II: Factors that Facilitate the Growth of CTE Programs**

14. The district has a local and state articulation agreement with community colleges and/or universities for courses offered.

- 1 Strongly Disagree
- 2 Disagree
- 3 Neither Disagree nor Agree
- 4 Agree
- 5 Strongly Agree

15. Dual enrollment opportunities have been established and are offered as course possibilities.

- 1 Strongly Disagree
- 2 Disagree
- 3 Neither Disagree nor Agree
- 4 Agree
- 5 Strongly Agree

16. Collaborations with local business and industry have been established.

- 1 Strongly Disagree
- 2 Disagree
- 3 Neither Disagree nor Agree
- 4 Agree
- 5 Strongly Agree

17. Students have access to industry credentialing exams.

- 1 Strongly Disagree
- 2 Disagree
- 3 Neither Disagree nor Agree
- 4 Agree
- 5 Strongly Agree

18. Workforce readiness skills have been identified and incorporated into career and technical education course offerings.

- 1 Strongly Disagree
- 2 Disagree
- 3 Neither Disagree nor Agree
- 4 Agree
- 5 Strongly Agree

19. Collaborations with local community colleges and universities have been established.

- 1 Strongly Disagree
- 2 Disagree
- 3 Neither Disagree nor Agree
- 4 Agree
- 5 Strongly Agree

20. Students and parents understand and take advantage of the courses offered within your district that are articulated in state and local articulation agreements.

- 1 Strongly Disagree
- 2 Disagree
- 3 Neither Disagree nor Agree
- 4 Agree
- 5 Strongly Agree

21. The district has established a method to evaluate the career and technical education program.

- 1 Strongly Disagree
- 2 Disagree
- 3 Neither Disagree nor Agree
- 4 Agree
- 5 Strongly Agree

22. The district evaluates the career and technical education program on a regular basis (i.e., at a minimum once a year).

- 1 Strongly Disagree
- 2 Disagree
- 3 Neither Disagree nor Agree
- 4 Agree
- 5 Strongly Agree

23. Career pathways/career clusters are available within the school system and understood by teachers.

- 1 Strongly Disagree
- 2 Disagree
- 3 Neither Disagree nor Agree
- 4 Agree
- 5 Strongly Agree

24. The district implements career pathways/career clusters.

- 1 Strongly Disagree
- 2 Disagree
- 3 Neither Disagree nor Agree
- 4 Agree
- 5 Strongly Agree

25. The district has established guidelines for tracking course completers.

- 1 Strongly Disagree
- 2 Disagree
- 3 Neither Disagree nor Agree
- 4 Agree
- 5 Strongly Agree

26. The district has established program marketing and public relations strategies.

- 1 Strongly Disagree
- 2 Disagree
- 3 Neither Disagree nor Agree
- 4 Agree
- 5 Strongly Agree

### **Section III: Factors Necessary to Sustain an Effective CTE Program**

27. Instructors are provided opportunities for continued professional development (i.e., professional development is offered to instructors at a minimum yearly).

- 1 Strongly Disagree
- 2 Disagree
- 3 Neither Disagree nor Agree
- 4 Agree
- 5 Strongly Agree

28. Teachers have the equipment and technology recommended to support teaching of career and technical education courses.

- 1 Strongly Disagree
- 2 Disagree
- 3 Neither Disagree nor Agree
- 4 Agree
- 5 Strongly Agree

29. The program administrator has a background in career and technical education and understands the importance of the program to the district.

- 1 Strongly Disagree
- 2 Disagree
- 3 Neither Disagree nor Agree
- 4 Agree
- 5 Strongly Agree

30. Strong leadership is in place at the state and local level with an understanding of and support for career and technical education programs.

- 1 Strongly Disagree
- 2 Disagree
- 3 Neither Disagree nor Agree
- 4 Agree
- 5 Strongly Agree

31. Resources and support are continually being sought.

- 1 Strongly Disagree
- 2 Disagree
- 3 Neither Disagree nor Agree
- 4 Agree
- 5 Strongly Agree

32. Information is disseminated to all stakeholders – students, parents, administrators, and community and business leaders – on a regular basis (at a minimum once a year) to provide updates and feedback.

- 1 Strongly Disagree
- 2 Disagree
- 3 Neither Disagree nor Agree
- 4 Agree
- 5 Strongly Agree

33. Data from technical assessments are used in decision-making.

- 1 Strongly Disagree
- 2 Disagree
- 3 Neither Disagree nor Agree
- 4 Agree
- 5 Strongly Agree

34. An advisory committee for career and technical education has been established.

- 1 Strongly Disagree
- 2 Disagree
- 3 Neither Disagree nor Agree
- 4 Agree
- 5 Strongly Agree

35. Funding has been secured and is continually being sought.

- 1 Strongly Disagree
- 2 Disagree
- 3 Neither Disagree nor Agree
- 4 Agree
- 5 Strongly Agree

36. Please list any comment you would like to add about your career and technical education program that you believe is a factor in helping sustain and grow your program.



**Section VI: Demographic Information**

37. Your years of experience in CTE: \_\_\_\_\_ 0-4 yrs. \_\_\_\_\_ 5 – 9 yrs  
\_\_\_\_\_ 10-14 yrs \_\_\_\_\_ 15-19 yrs.  
\_\_\_\_\_ 20 + yrs.

38. Your years of experience as a CTE Director: \_\_\_\_\_ 0-4 yrs. \_\_\_\_\_ 5 – 9 yrs  
\_\_\_\_\_ 10-14 yrs \_\_\_\_\_ 15-19 yrs.  
\_\_\_\_\_ 20 + yrs.

39. Geographic Description of your district (U.S. Department of Justice, 2008):

\_\_\_\_\_ Rural (a locale with a density less than 500 people per square mile and more than 30 miles from an urban area)

\_\_\_\_\_ Suburban (a locale no more than 30 miles from an urban area or with a density greater than or equal 500 people per square mile and less than 2,000 people per square mile)

\_\_\_\_\_ Urban (a locale with a density greater than or equal to 2,000 people per square mile or a place that has a total population greater than or equal to 100,000 people)

40. List the percentage of students in your district who receive free and/or reduced lunch.  
\_\_\_\_\_ %

## APPENDIX F

## Revised Research Objective Concept Matrix (After Pilot Study)

Key Construct(s)	Variable(s)	Supporting Literature
RO <sub>1</sub> : Factors that support the implementation of a career and technical education program	Teachers hold appropriate degrees and licenses	Klein (2010); Silverberg (2004); US Department of Education Office of Vocational and Adult Education (2006)
	Sequence of rigorous coursework	Driscoll (2004); Arizona Department of Education (2011); Klein (2010); Minnesota Department of Education (2006)
	Integration of career and technical education and core subjects	Association of Career and Technical (2006)
	Work-based learning experiences	Driscoll (2004); Kendall (2006); NC Department of Public Instruction (2009); Arizona Department of Education (2011)
	Career academies	Sarkees-Wircenski (2004)
	Student organizations	Student Organizations (2010); Career and Technical Education (2010)
	Technical assessments	North Carolina CTE State Profile (2009); US Department of Education (2006)
	Support and guidance during	Huss (2001); Context

	registration	and Change (2001); National Governors Association (2007)
	Counselors can advise on the benefits of CTE and aid students in course selection	Huss (2001)
	Established goals, objectives, and a mission	US Department of Education Office of Vocational and Adult Education (2006)
	An established operating budget to fund facilities and equipment	Reese (2002); Driscoll (2004)
RO <sub>2</sub> : Factors that facilitate the growth of career and technical education programs	Local and state articulation agreement	US Department of Education Office of Vocational and Adult Education (2006); North Carolina CTE State Profile (2009)
	Dual enrollment opportunities have been established and are offered as course possibilities	National Research Center (2010); Bailey & Karp (2003)
	Collaboration with local business and industry	NC Department of Public Instruction (2009); US Department of Education Office of Vocational and Adult Education (2006)
	Students have access to industry credentials exams	Sarkees-Wircenski (2004)
	Workforce readiness skills have been identified and incorporated into CTE course offerings	Sarkees-Wircenski (2004)
	Collaboration with local community colleges and universities	Silverberg (2004); US Department of Education Office of Vocational and Adult

		Education (2006)
	Students and parents understand the advantages of articulated courses being offered	Klein (2010); Silverberg (2004)
	A method for program evaluation has been established	Klein (2010); Silverberg (2004)
	District evaluates program on a regular basis	Arizona Department of Education (2011); Klein (2010); Silverberg (2004); US Department of Education Office of Vocational and Adult Education (2006)
	Career pathways are available within the school system and understood by teachers	NC Career Clusters (2009) Klein (2010); Silverberg (2004)
	Guidelines are established for tracking completers	Klein (2010); Silverberg (2004)
	Program marketing strategies are in place	
RO <sub>3</sub> : Factors necessary to sustain an effective career and technical education program.	Professional development for instructors	Klein (2010); Silverberg (2004); US Department of Education Office of Vocational and Adult Education (2006)
	Equipment and technology recommended for teaching are present	Klein (2010); NC Department of Public Instruction (2009); Silverberg (2004)
	Program administrator has a background in CTE	Klein (2010); Silverberg (2004)

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Strong leadership is in place at the state and local level who understand and support CTE	National Governors Association (2007)
Resources and support are sought	Klein (2010); Minnesota Department of Education (2006); NC Department of Public Instruction (2009)
Information is disseminated to all stakeholders	Arizona Department of Education (2011); Klein (2010); Silverberg (2004)
Data from technical assessments are used in decision-making	Arizona Department of Education (2011); Klein (2010); Silverberg (2004)
An advisory committee has been established	Klein (2010); US Department of Education Office of Vocational and Adult Education (2006)
Funding has been secured and is continually sought	Reese (2002); Driscoll (2004)

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## APPENDIX G

### Letter to Participants Addressing Reliability

November 22<sup>nd</sup>, 2011

Dear Career and Technical Education Director:

I am currently working on research to use as part of my dissertation and degree program at Old Dominion University in Occupational and Technical Studies with a concentration in Career and Technical Education. I am inviting you to participate in a pilot study to test the reliability of the instrument that I plan to use.

The goal of my research is to identify components needed for the design of a sustainable career and technical education program. There are three research objectives: RO<sub>1</sub> - factors that support the implementation of a career and technical education program; RO<sub>2</sub>- factors that facilitate growth of career and technical education programs, and RO<sub>3</sub> . factors necessary to sustain an effective career and technical education program.

Your participation in the completion of the survey is completely voluntary and all responses will be held confidential. Furthermore, no personal information will be collected. By completing and returning the survey you are showing your willingness to participate in this study. After completing the survey, please complete the attached questionnaire to assist me in improving the reliability of my survey.

To complete the survey, click on the link below.

**<http://www.zoomerang.com/Survey/WEB22DWUWV9RFX>**

If you prefer to print the survey and mail it to me at 622 Yeopim Road, Edenton, NC 27932, please feel free to do so. Thank you for your participation and contributing to the success of my research!

Sincerely,

Vann M. Lassiter, M.Ed.  
Ph.D. Candidate, Occupational & Technical Education  
Old Dominion University  
Norfolk, Virginia

John M. Ritz, Ed.D.  
Professor  
Old Dominion University  
Norfolk, Virginia

## APPENDIX H

### Pilot Survey Questionnaire

**Directions:** Please complete the survey using the link included in the e-mail sent from the researcher BEFORE completing the following questions. After completing the survey and this questionnaire, return via e-mail to [vlass002@odu.edu](mailto:vlass002@odu.edu) or mail to 622 Yeopim Road, Edenton, North Carolina 27932. Your participation is greatly appreciated.

1. Were the directions for completing the survey clearly stated? If not, what was missing and how could the directions be reworded to make them clearer? Would the directions be interpreted the same by all participants?
  
  
  
  
  
  
  
  
  
  
2. Were the survey questions clear and easy to understand? If not, which questions were unclear and what was unclear about those survey questions? Would the questions be interpreted the same by all participants?
  
  
  
  
  
  
  
  
  
  
3. Did you experience technical difficulties taking the survey online? If so, what technical difficulties did you experience? How could they be resolved (if possible)?
  
  
  
  
  
  
  
  
  
  
4. Are there any additional comments, suggestions or concerns you have about the survey instrument related to its content? If so, please explain.

## APPENDIX I

### Final Revised Survey

#### COMPONENTS NEEDED FOR THE DESIGN OF A SUSTAINABLE CAREER AND TECHNICAL EDUCATION PROGRAM

**Purpose:** The problem of this study will be to identify components needed for the design of a sustainable career and technical education program. Through this study the researcher hopes to determine (1) the factors that support the implementation of a career and technical education program, (2) factors that facilitate the growth of career and technical education programs, and (3) factors necessary to sustain an effective career and technical education program.

**Directions:** Please respond to each question by clicking the appropriate number on the 5-point Likert scale, from Strongly Disagree (1) to Strongly Agree (5). Questions will address the importance to what a program should be and what effective programs should include. The data collected from this study will be confidential. Thank you for your help!

#### **Section I: Factors of Implementation of a CTE Programs**

1. Teachers hold appropriate degrees and/or licenses for the courses taught.

- 1 Strongly Disagree
- 2 Disagree
- 3 Neither Disagree nor Agree
- 4 Agree
- 5 Strongly Agree

2. There is a set sequence of rigorous courses (courses that have been identified and standards are adhered to) that are relevant to the 16 national career clusters that combines academic and technical concepts and skills.

- 1 Strongly Disagree
- 2 Disagree
- 3 Neither Disagree nor Agree
- 4 Agree
- 5 Strongly Agree

3. Integration of career and technical education and core standards occur in your district.

- 1 Strongly Disagree
- 2 Disagree
- 3 Neither Disagree nor Agree
- 4 Agree



5 Strongly Agree

4. Work-based learning, opportunities for students to see how classroom instruction connects to the world of work through hands-on application, has been established in your district (i.e., co-op, internships, co-curricular organization involvement, job shadowing, field trips, and/or service learning).

- 1 Strongly Disagree
- 2 Disagree
- 3 Neither Disagree nor Agree
- 4 Agree
- 5 Strongly Agree

5. Career academies, learning communities focused on a specific career cluster or pathway, have been established.

- 1 Strongly Disagree
- 2 Disagree
- 3 Neither Disagree nor Agree
- 4 Agree
- 5 Strongly Agree

6. Career and technical education student organizations have been established and are active (i.e., student organizations meet throughout the year to plan, discuss, and implement projects).

- 1 Strongly Disagree
- 2 Disagree
- 3 Neither Disagree nor Agree
- 4 Agree
- 5 Strongly Agree

7. Technical assessments have been established and are used within the district.

- 1 Strongly Disagree
- 2 Disagree
- 3 Neither Disagree nor Agree
- 4 Agree
- 5 Strongly Agree

8. Students are provided support and guidance during course selection which includes their options to take career and technical education courses.

- 1 Strongly Disagree
- 2 Disagree
- 3 Neither Disagree nor Agree

- 4 Agree
- 5 Strongly Agree

9. Counselors can advise on the benefits of career and technical education and aid students in course and program selection.

- 1 Strongly Disagree
- 2 Disagree
- 3 Neither Disagree nor Agree
- 4 Agree
- 5 Strongly Agree

10. The district has established a mission for the career and technical education program.

- 1 Strongly Disagree
- 2 Disagree
- 3 Neither Disagree nor Agree
- 4 Agree
- 5 Strongly Agree

11. The district has established goals for the career and technical education program.

- 1 Strongly Disagree
- 2 Disagree
- 3 Neither Disagree nor Agree
- 4 Agree
- 5 Strongly Agree

12. The district has established objectives for the career and technical education program.

- 1 Strongly Disagree
- 2 Disagree
- 3 Neither Disagree nor Agree
- 4 Agree
- 5 Strongly Agree

13. An operating budget has been established to fund adequate facilities and equipment.

- 1 Strongly Disagree
- 2 Disagree
- 3 Neither Disagree nor Agree
- 4 Agree
- 5 Strongly Agree

**Section II: Factors that Facilitate the Growth of CTE Programs**

14. The district has a local and state articulation agreement with community colleges and/or universities for courses offered.

- 1 Strongly Disagree
- 2 Disagree
- 3 Neither Disagree nor Agree
- 4 Agree
- 5 Strongly Agree

15. Dual enrollment opportunities have been established and are offered as course possibilities.

- 1 Strongly Disagree
- 2 Disagree
- 3 Neither Disagree nor Agree
- 4 Agree
- 5 Strongly Agree

16. Collaborations with local business and industry have been established.

- 1 Strongly Disagree
- 2 Disagree
- 3 Neither Disagree nor Agree
- 4 Agree
- 5 Strongly Agree

17. Students have access to industry credentialing exams.

- 1 Strongly Disagree
- 2 Disagree
- 3 Neither Disagree nor Agree
- 4 Agree
- 5 Strongly Agree

18. Workforce readiness skills have been identified and incorporated into career and technical education course offerings.

- 1 Strongly Disagree
- 2 Disagree
- 3 Neither Disagree nor Agree
- 4 Agree
- 5 Strongly Agree

19. Collaborations with local community colleges and universities have been established.

- 1 Strongly Disagree
- 2 Disagree
- 3 Neither Disagree nor Agree
- 4 Agree
- 5 Strongly Agree

20. Students and parents understand and take advantage of the courses offered within your district that are articulated in state and local articulation agreements.

- 1 Strongly Disagree
- 2 Disagree
- 3 Neither Disagree nor Agree
- 4 Agree
- 5 Strongly Agree

21. The district has established a method to evaluate the career and technical education program.

- 1 Strongly Disagree
- 2 Disagree
- 3 Neither Disagree nor Agree
- 4 Agree
- 5 Strongly Agree

22. The district evaluates the career and technical education program on a regular basis (i.e., at a minimum once a year).

- 1 Strongly Disagree
- 2 Disagree
- 3 Neither Disagree nor Agree
- 4 Agree
- 5 Strongly Agree

23. Career pathways/career clusters are available within the school system and understood by teachers.

- 1 Strongly Disagree
- 2 Disagree
- 3 Neither Disagree nor Agree
- 4 Agree
- 5 Strongly Agree

24. The district implements career pathways/career clusters.

- 1 Strongly Disagree
- 2 Disagree
- 3 Neither Disagree nor Agree
- 4 Agree
- 5 Strongly Agree

25. The district has established guidelines for tracking course completers.

- 1 Strongly Disagree
- 2 Disagree
- 3 Neither Disagree nor Agree
- 4 Agree
- 5 Strongly Agree

26. The district has established program marketing and public relations strategies.

- 1 Strongly Disagree
- 2 Disagree
- 3 Neither Disagree nor Agree
- 4 Agree
- 5 Strongly Agree

**Section III: Factors Necessary to Sustain an Effective CTE Program**

27. Instructors are provided opportunities for continued professional development (i.e., professional development is offered to instructors at a minimum yearly).

- 1 Strongly Disagree
- 2 Disagree
- 3 Neither Disagree nor Agree
- 4 Agree
- 5 Strongly Agree

28. Teachers have the equipment and technology recommended to support teaching of career and technical education courses.

- 1 Strongly Disagree
- 2 Disagree
- 3 Neither Disagree nor Agree
- 4 Agree
- 5 Strongly Agree

29. The program administrator has a background in career and technical education and understands the importance of the program to the district.

- 1 Strongly Disagree
- 2 Disagree
- 3 Neither Disagree nor Agree
- 4 Agree
- 5 Strongly Agree

30. Strong leadership is in place at the state and local level with an understanding of and support for career and technical education programs.

- 1 Strongly Disagree
- 2 Disagree
- 3 Neither Disagree nor Agree
- 4 Agree
- 5 Strongly Agree

31. Resources and support are continually being sought.

- 1 Strongly Disagree
- 2 Disagree
- 3 Neither Disagree nor Agree
- 4 Agree
- 5 Strongly Agree

32. Information is disseminated to all stakeholders – students, parents, administrators, and community and business leaders – on a regular basis (at a minimum once a year) to provide updates and feedback.

- 1 Strongly Disagree
- 2 Disagree
- 3 Neither Disagree nor Agree
- 4 Agree
- 5 Strongly Agree

33. Data from technical assessments are used in decision-making.

- 1 Strongly Disagree
- 2 Disagree
- 3 Neither Disagree nor Agree
- 4 Agree
- 5 Strongly Agree

34. An advisory committee for career and technical education has been established.

- 1 Strongly Disagree
- 2 Disagree
- 3 Neither Disagree nor Agree
- 4 Agree
- 5 Strongly Agree

35. Funding has been secured and is continually being sought.

- 1 Strongly Disagree
- 2 Disagree
- 3 Neither Disagree nor Agree
- 4 Agree
- 5 Strongly Agree

36. Please list any comments you would like to add about your career and technical education program that you believe is a factor in helping sustain and grow your program.

**Section VI: Demographic Information**

37. Your years of experience in CTE: \_\_\_\_\_ 0-4 yrs. \_\_\_\_\_ 5 – 9 yrs  
\_\_\_\_\_ 10-14 yrs \_\_\_\_\_ 15-19 yrs.  
\_\_\_\_\_ 20 + yrs.

38. Your years of experience as a CTE Director: \_\_\_\_\_ 0-4 yrs. \_\_\_\_\_ 5 – 9 yrs  
\_\_\_\_\_ 10-14 yrs \_\_\_\_\_ 15-19 yrs.  
\_\_\_\_\_ 20 + yrs.

39. Geographic Description of your district (U.S. Department of Justice, 2008):

\_\_\_\_\_ Rural (a locale with a density less than 500 people per square mile and more than 30 miles from an urban area)

\_\_\_\_\_ Suburban (a locale no more than 30 miles from an urban area or with a density greater than or equal 500 people per square mile and less than 2,000 people per square mile)

\_\_\_\_\_ Urban (a locale with a density greater than or equal to 2,000 people per square mile or a place that has a total population greater than or equal to 100,000 people)

40. List the percentage of students in your district who receive free and/or reduced lunch.  
\_\_\_\_\_ %



## **APPENDIX J**

### **Letter to Career and Technical Education Directors Participating in Study**

December 6<sup>th</sup>, 2011

Dear Career and Technical Education Directors:

I am currently working on research to use as part of my Ph.D. dissertation and degree program at Old Dominion University in Occupational and Technical Studies with a concentration in Career and Technical Education. The goal of my research is to identify components needed for the design of a sustainable career and technical education program.

I am inviting you to participate in this study so your opinion can be voiced and heard. With your input this information can be used by the state and others when improving existing career and technical education programs or designing new ones. It is also the hope of the researcher that such data can be collected to support the benefits for stakeholders in career and technical education and develop strategies to help existing career and technical education programs continue to grow.

Your participation in this survey is voluntary and all responses will be held confidential. Furthermore, no personal information will be collected – only survey findings. Data will be reported as aggregated information and no individual's name or responses will be disclosed. By completing and returning the survey you are showing your willingness to participate in this study.

To complete the survey, click on the link below.

**<http://www.zoomerang.com/Survey/WEB22E248W8TZG>**

Questions will address the importance of such programs and what effective programs should include. If you prefer to print the survey and mail it to me at 622 Yeopim Road, Edenton, NC 27932, please feel free to do so. Thank you for participating and contributing to the success of my research!

Sincerely,

Vann M. Lassiter, M.Ed.  
Ph.D. Candidate, Occupational and Technical Education  
Old Dominion University  
Norfolk, Virginia

## **APPENDIX K**

### **Follow-Up Letter to Career and Technical Education Directors Participating in Study**

December 15<sup>th</sup>, 2011

Dear Career and Technical Education Directors:

About 7 business days ago you were sent an invitation to participate in a research study designed to identify components needed for the design of a sustainable career and technical education program. This study is being conducted in partial fulfillment of the requirements in the attainment of a doctorate degree at Old Dominion University in Norfolk, Virginia.

I am sending this letter re-inviting you to participate in this study so your opinion can be voiced and heard. With your input this information can be used by the state and others when designing new career and technical education programs. It is also the hope of the researcher that such data be collected to support the benefits of the program for stakeholders in career and technical education and to develop strategies to help existing career and technical education programs continue to grow.

Your participation in this survey is completely voluntary and all responses will be held confidential. Furthermore, no personal information will be collected – only survey findings. Data will be reported as aggregated information and no individual's name or responses will be disclosed. By completing and returning the survey you are showing your willingness to participate in this study. If you have not completed the survey previously, please click on the link below to do so.

**<http://www.zoomerang.com/Survey/WEB22E248W8TZG>**

Questions will address the importance of such programs and what effective programs should include. If you prefer to print the survey and mail it to me at 622 Yeopim Road, Edenton, NC 27932, please feel free to do so. Thank you for participating and contributing to my research!

Sincerely,

Vann M. Lassiter, M.Ed.  
Ph.D. Candidate, Occupational and Technical Education  
Old Dominion University  
Norfolk, Virginia

## **APPENDIX L**

### **Survey Comments**

The following comments were submitted by participants as responses to question 36 of the survey.

- Strong partnerships with community colleges are very important (n=2).
- Principal support is a major factor in receiving support from core teachers.
- Partnerships are constantly being cultivated and encouraged and the benefits are both monetary and non-monetary.
- Understanding pathways and clusters are important and the ability for the district to move from pathways into clusters is just as important.
- Having strong state leadership is important because many issues or factors are state mandated and not district level issues.
- Superintendent support is important to CTE programs.
- One can attend local economic development and Chamber of Commerce meetings to align CTE courses to job market trends. CTE and local industry alignment are important for the success of CTE programs.
- CTE is instrumental to economic sustainability. CTE should begin in elementary school, and it should be incorporated into all subject areas. Without it, the economic condition is not looking promising.
- Publicity of student success in CTSOs – career and technical student organizations – at the local, district, state and national levels are helpful marketing strategies.

- Strong partnerships with local business, chamber of commerce, economic development commission, county commissioners, and local government are important.
- Having knowledge as a state staffer with not only program area experience, but also in program administration is extremely effective in sustaining meaningful curriculum and support.
- As a federally funded program, each LEA (local education agency) has a LPS (local planning system) which outlines the goals and detailed implementation of the CTE program in that LEA. This is important.
- Course content in the state of North Carolina for CTE needs to be updated more often than every 5 years at the state level.
- CTE teachers feel they are isolated and not valued to the extent of content or core teachers. The issue is not in the collaboration of teachers but often is the result of the desire for isolation of CTE as a separate entity by regional leads.
- Strong support from local school board, the community, and visionary leaders who support CTE is important.
- I believe that CTE can be effectively led by someone other than a person with CTE experience. People with curriculum backgrounds make great leaders; however, building-level administrators often see the courses as utilitarian and not systemic.

## VITA

Vann Mizzelle Lassiter  
622 Yeopim Road  
Edenton, North Carolina 27932  
252-562-2540  
vannlassiter@mail.com

## EDUCATIONAL BACKGROUND

Old Dominion University – Norfolk, Virginia  
**Ph.D. in Education – Occupational and Technical Studies**, 12/2008 – 5/2012  
Concentration in Career and Technical Education  
Guadalajara, Mexico, Study Abroad Program Participant

North Carolina State University – Raleigh, North Carolina  
**Master's of Education – Curriculum and Instruction**, 5/2006 – 5/2008  
Concentration in Business and Marketing Education  
Florence, Italy, Study Abroad Program Participant

North Carolina State University – Raleigh, North Carolina  
**Bachelor of Science – Business and Marketing Education**, 8/2002 – 5/2006  
Graduated Magna Cum Laude with a minor in Business Management

## PROFESSIONAL EXPERIENCE

Edenton-Chowan Public Schools – Edenton, North Carolina  
**Instructional Technologist**, 7/2011 – Present

John A. Holmes High School – Edenton, North Carolina  
**Business and Information Technology Teacher**, 7/2006 – 7/2011

## PUBLICATIONS

Lassiter, V. M. (2010). *Victor goes to sixth grade: The impact of a teacher*.  
Bloomington, IN: AuthorHouse Publishing.

## ASSOCIATION MEMBERSHIPS

North Carolina Association for Career and Technical Education  
North Carolina Business Education Association  
National Business Education Association  
Association for Career and Technical Education  
North Carolina Technology in Education Society  
International Society for Technology in Education  
Professional Educators of North Carolina

North Carolina Association of School Administrators  
Edenton Historical Commission  
Phi Delta Kappa National Educational Honor Society  
Honor Society of Phi Kappa Phi  
Phi Eta Sigma National Honor Society  
Gamma Beta Phi Honor Society  
Golden Key International Honor Society

## **HONORS AND AWARDS**

2011 Edenton-Chowan Education Foundation Grant Winner  
2010-2011 AT&T Northeast NC Regional (Region I) Teacher of the Year  
2009-2010 Edenton-Chowan Schools Teacher of the Year  
2009-2010 John A. Holmes High School Teacher of the Year  
2010 Bright Ideas Grant Winner  
2010 North Carolina Teacher Cadet Grant Winner  
North Carolina Teaching Fellow Recipient