THE EFFECTS OF TEACHER EXPERIENCE ON THE WORKPLACE READINESS
OF HIGH SCHOOL STUDENTS

by

Katherine Mitchell Thomas

Liberty University

A Dissertation Presented in Partial Fulfillment
of the Requirements for the Degree

Doctor of Education

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ABSTRACT

Over the last decade attention has been placed on the emergent gap between education and the workplace. In response, school systems have provided instructional opportunities such as career pathways to better prepare students with the necessary knowledge and skills needed to be workplace ready. This dissertation sought to review two factors considered essential to this endeavor—teacher experience in business and industry and career and technical education (CTE). In doing so, this causal-comparative study examined 594 high school students in a northwest Georgia school district to see if there was a difference in the ACT WorkKeys® scores of students completing a career pathway taught by an instructor with two or more years of experience in business and industry and students completing a career pathway taught by an instructor without two or more years of experience in business and industry. Additionally, there was an examination to see if a difference exists between the scores of students completing a CTE career pathway and students completing a non-CTE career pathway. Students took the ACT WorkKeys® assessment in Applied Mathematics, Locating Information, and Reading for Information with their results reported as scale and level scores. Though no statistically significant differences were concluded related to the effects of teacher experience on the workplace readiness of high school students, this study serves as an indicator that workplace preparation needs to be further addressed to ensure a viable workforce in the 21st century.

Keywords: ACT WorkKeys®, teacher experience, business and industry, career pathways, completers, career and technical education, workplace readiness
Dedication

This dissertation is dedicated to my sons, Logan and Reed, who have always known their mother as a student. It is my hope that my love for learning inspires both of them to never stop growing as individuals to accomplish all I know they are capable of achieving.
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To my family, I cannot express how much your never-ending support of all my endeavors has meant to me over the years—I am forever grateful. I especially want to thank my husband, Jonathan, and my mother, Lee Ann, for their constant words of encouragement and companionship during all my travels back and forth to Lynchburg. To my committee members, Dr. Fred Conner, Dr. Kelly Paynter, and Dr. Melissa Williams and my research consultant, Dr. Scott Watson, I have truly been blessed by your invaluable knowledge, guidance and support throughout this process. To my colleagues, who I am lucky enough to call friends, I could not ask to work with a better group of people and thank each of you for inspiring me on a daily basis. Lastly, there are no words for my gratitude and appreciation to God for His never-ending love, support, and guidance, through this process, and all the seasons of my life. To God be the glory…
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List of Abbreviations

ACCT: Architecture, Construction, Communications and Transportation

ACTE: Association of Career and Technical Education

CASAS: Comprehensive Adult Student Assessment Systems

CTE: Career and Technical Education

DV: Dependent Variable

EEOC: Equal Employment Opportunity Commission

HVAC: Heating, Ventilation, and Air Conditioning

ISTE: International Society for Technology in Education

IV: Independent Variable

NCLB: No Child Left Behind

O*NET: Occupational Information Network

SCANS: Secretary’s Commission on Achieving Necessary Skills

SETDA: State Educational Technology Directors Association

SCCT: Social Cognitive Career Theory
CHAPTER ONE: INTRODUCTION

College and career readiness has become a phrase known to many, but understood and implemented successfully by few. Arne Duncan, U.S. Secretary of Education, stated, “…the truth is that most people—and I include myself here—have focused primarily on college-readiness. Too often, career readiness is an afterthought” (Duncan, 2011, para. 8). This has become a cause for concern in America because “the bridges needed to connect academic, technical and employability knowledge, skills and disposition are still being built” (Moscon & Thompson, 2013, p. 20). Trends have shown that an emphasis over time on becoming college-ready has failed America at a time where skilled labor is at a premium. “By 2005 only one-fifth of high school students specialized in an industry, compared with one-third in 1983. The share of 17-year-olds aspiring to four-year college, meanwhile, reached 69% in 2003, double the level in 1981” (“Too Narrow, Too Soon,” 2010, para. 3). This inconveniently comes at a time where the fastest growing demand is for those with a two-year technical college degree or specialized skill training rather than a four-year degree (“Too Narrow, Too Soon,” 2010). “What is needed to narrow the gap between education and workforce preparation? One element is resoundingly clear—a teacher with experience in both” (Moscon & Thompson, 2013, p. 20).

Background

In America, the vocational education system took roots during colonial times. As the country progressed and moved toward the industrial revolution, the need for an even more skilled workforce increased. This led to the Morrill Act of 1862; sponsored by Senator Justin Morrill, this legislation called for land-grant college provisions to support agricultural colleges (Goodsell, 2005).
Vocational education continued to be a topic among educational establishments and even in Congress well into the turn of the century. It was in 1914 that President Woodrow Wilson convened a commission to study whether federal funds were needed to support vocational education (Gordon, 2013). Georgia Senator Hoke Smith chaired the commission and reported to Congress that there was an “urgent social and educational need of vocational training in public schools” (p. 2).

This report initiated the Smith-Hughes Act of 1917 named for the two Georgia Senators, Hoke Smith and Dudley Mays Hughes, who were primarily responsible for the bill. The legislation allowed for federal funding to vocational and agricultural education. The Act’s primary purpose was to provide programs that offered entry-level and skilled training to prepare students to go to work. Its focus was “basic support, providing funds for teachers and teacher training, and encouraging state support for vocational education through extensive funds-matching requirements” (Gordon, 2013, p. 3).

Federal support would continue to follow the path set forth by the Smith-Hughes Act until a wave of reform often referred to as the restructuring (Gordon, 2013). In 1983 a report was published by the National Commission on Excellence in Education called *A Nation at Risk*. The report brought to light many concerns including the poor performance of American schools compared to other countries and a failure to integrate academic and vocational curriculums (Gordon, 2013). The response to the report was a sense of urgency, one that led to key legislation for vocational education.

The Carl D. Perkins Vocational Act of 1984 (Pub. L. 98-524), known as the Perkins Act, was Congress’ affirmation that vocational training in schools was indeed important (Gordon,
This legislation would emphasize the importance of training youth and adults with skills needed for the workforce. In 1990, Congress passed a reauthorization of the original act in the form of Carl D. Perkins Vocational and Applied Technology Act (Pub. L. 101-392), which became known as Perkins II (Gordon, 2013). This would spark the much needed conversation of integrating academics and vocational education. It is also during this twenty-year period that educators would start referring to vocational education as career and technical education.

“Vocational education changed its name and, in many cases, its program direction from low-skill ‘occupational training’ to career and technical education with transferrable skills that are applicable to many occupations and anchored in strong academics” (Daggett, 2002, p. 2).

This became the drive behind the Perkins legislation that would continue to be reauthorized, leading up to Perkins IV, which was passed in 2006, following the “No Child Left Behind” (NCLB) legislation of 2001. The increased accountability of NCLB forced career and technical education to adapt to a new way of doing things in order to attract students to skilled work, such as partnering with business and industry, to show real-world applicability. It was during this time that it became “more essential than ever for career and technical education to be able to prove that it contributes not just to the applied workplace competency demands of business, but also to the academic proficiencies of served student populations” (Daggett, 2002, p. 2). Thus, the importance of career and technical instructors with business and industry experience to be able to expose students to technical curriculum, while integrating academic standards that are directly applicable to the workplace.

Therefore educators have seen a call for change over the last few decades in how to fully prepare students. This is indicated by various reports and legislation including *A Nation at Risk*
Students graduate high school every day less prepared to enter the workplace (ACTE, 2008). As a nation, the emphasis on secondary and postsecondary learning has slowly become a culture of knowing rather than doing. “America has evolved from an industrial economy to a knowledge economy” with a growing skills gap as a result (p. 1). In response, taking career and technical education (CTE) courses is “strongly related to persisting to graduation” while
“preparing students for the postsecondary education and training that will be critical to future economic successes” (ACTE, 2006, p. 4; Plank, 2001, p. 35). Therefore, how workplace readiness is measured and its role in high school reform is one of the nation’s top priorities.

**Purpose Statement**

The purpose of this causal-comparative study was to determine if there is a difference between the workplace readiness scores of high school students that complete a career pathway taught by an instructor with two or more years of experience in business and industry compared to the workplace readiness scores of those completing a career pathway taught by an instructor without two or more years of experience in business and industry. Career pathways examined were categorized in the following program areas: Agriculture; Architecture, Construction, Communications and Transportation (ACCT); Business and Computer Science; Education; Engineering and Technology; Fine Arts; Foreign Language; Government and Public Safety; Healthcare Science; and Marketing, Sales and Service.

**Significance of the Study**

This study attempted to show a difference between the workplace readiness scores of students completing a career pathway taught by an instructor with two or more years of business and industry experience as compared to students completing a career pathway taught by an instructor without two or more years of business and industry experience. Moreover, the study sought to show the importance of CTE courses and their impact on the workplace readiness of high school students. ACTE (2006) found that “making learning relevant is one of the best ways to ensure students stay interested in their coursework, while also preparing them for college and the workforce” (p. 4). ACT (2009) concluded that students will be more successful in academics
and their careers when educators help to “provide students with opportunities to have career-related success experiences that can serve to further reinforce students’ interests in, and pursuit of various occupations” (p. 6). Therefore, teachers who have first-hand experience working in the field in which they are teaching should be better prepared to provide the meaningful, real-world experiences needed to assist students in becoming more college and career ready (Moscon & Thompson, 2013).

**Research Questions and Hypotheses**

Research Question 1: Is there a difference in the ACT WorkKeys® Applied Mathematics scale scores of students who have completed a career pathway taught by a teacher with two or more years of business and industry experience and those whose teachers do not have two or more years of business and industry experience?

Null Hypothesis (Ho1): There is no statistically significant difference in the scale scores on the ACT WorkKeys® assessment in Applied Mathematics between high school students who have completed a career pathway taught by a teacher with two or more years of business and industry experience and those completing a career pathway taught by a teacher without two or more years of business and industry experience.

Research Question 2: Is there a difference in the ACT WorkKeys® Locating Information scale scores of students who have completed a career pathway taught by a teacher with two or more years of business and industry experience and those whose teachers do not have two or more years of business and industry experience?
Null Hypothesis (Ho2): There is no statistically significant difference in the scale scores on the ACT WorkKeys® assessment in Locating Information between high school students who have completed a career pathway taught by a teacher with two or more years of business and industry experience and those completing a career pathway taught by a teacher without two or more years of business and industry experience.

Research Question 3: Is there a difference in the ACT WorkKeys® Reading for Information scale scores of students who have completed a career pathway taught by a teacher with two or more years of business and industry experience and those whose teachers do not have two or more years of business and industry experience?

Null Hypothesis (Ho3): There is no statistically significant difference in the scale scores on the ACT WorkKeys® assessment in Reading for Information between high school students who have completed a career pathway taught by a teacher with two or more years of business and industry experience and those completing a career pathway taught by a teacher without two or more years of business and industry experience.

Research Question 4: Is there a difference in the ACT WorkKeys® overall level scores of students who have completed a career pathway taught by a teacher with two or more years of business and industry experience and those whose teachers do not have two or more years of business and industry experience?

Null Hypothesis (Ho4): There is no statistically significant difference in the overall level scores on the ACT WorkKeys® assessment between high school students who have completed a career pathway taught by a teacher with two or more years of business and industry experience
and those completing a career pathway taught by a teacher without two or more years of business and industry experience.

Research Question 5: Is there a difference in the ACT WorkKeys® overall level scores of CTE career pathway completers and non-CTE career pathway completers?

Null Hypothesis (Ho5): There is no statistically significant difference in the overall level scores on the ACT WorkKeys® assessment between high school students who have completed a CTE career pathway and high school students who have completed a non-CTE career pathway.

**Identification of Variables**

The independent variable in this study was career pathway teachers’ experience in business and industry. There were two levels—two or more years of experience in business and industry and less than two years of experience in business and industry. Career pathways considered in this study were Agriculture, Business, Construction, Education, Engineering, Government and Public Safety, Healthcare Science, Marketing, Metals, and Transportation—all which fall under the CTE umbrella. Fine Arts and Foreign Language career pathways were also included, but were considered non-CTE. Of the career pathways mentioned, Construction, Government and Public Safety, Healthcare Science, Metals and Transportation are categorized as Trade and Industrial fields. The Georgia Professional Standards Commission requires teachers in Trade and Industrial fields to have two or more years of experience in their respective business or industry in order to be eligible to teach that subject (Rule 505-2-.96). It is possible, however, that teachers in other program areas could have in-field business and industry experience. Therefore, pathways were grouped in the following categories for data analysis purposes: CTE pathways taught by teachers with two or more years of business and industry experience, CTE
pathways taught by teachers without two or more years of business and industry experience, non-CTE pathways taught by teachers with two or more years of business and industry experience and non-CTE pathways taught by teachers without two or more years of business and industry experience.

The dependent variable in this study was the workplace readiness of high school students. Workplace readiness was indicated by students’ scale scores on the ACT WorkKeys® individual assessments, Applied Mathematics, Locating Information, and Reading for Information, but primarily determined by the overall level score earned. A student scoring high enough to earn the workplace readiness credential had scores ranging from 71-90 with a corresponding level score for each assessment ranging from bronze to platinum. Workplace readiness is determined by the overall earned level score—which is equal to the lowest earned score of the three assessments. Level scores are <3, not high enough to earn a certificate; Level 3, Bronze; Level 4, Silver; Level 5, Gold; and Levels 6 and 7, Platinum.

**Definitions**

*ACT.* A nonprofit organization most commonly associated with college admissions testing. Today it provides assessment, research and program management services for educational agencies and workplaces (ACT, 2013).

*ACT WorkKeys®.* “ACT WorkKeys® is a job skills assessment system that helps employers to select, hire, train, develop, and retain a high-performance workforce.” The assessment measures foundational skills such as Applied Mathematics, Locating Information, and Reading for Information as well as soft skills (ACT, 2013, “ACT WorkKeys Overview,” para. 1).

Business and Industry. A broad category of public and private workplaces that provide employment opportunities for individuals of varying levels of education, skill and experience.

Career Pathway. A series of three or four courses in a related area of study (Georgia Department of Education, 2013).

Career and Technical Education (CTE). Prepares students, both young and old, for careers by teaching them core academic skills, employability skills, and job-specific, technical skills (ACTE, 2013).

Fine Arts. A local, school system defined concentration area consisting of the following courses: visual arts, band, chorus, and performing arts/drama.

Foreign Language. A local, school system defined concentration area consisting of the following courses: Spanish and German.

Trade and Industrial. A concentration area consisting of the following courses: construction, metals, transportation, healthcare science, and government and public safety.

Workplace Readiness. Prepared with the academic and technical skills necessary to meet the demands of today’s global economy (ACTE, 2008).
CHAPTER TWO: REVIEW OF LITERATURE

An overview of the theoretical framework guiding the study is presented in this chapter including a review of what it means to be work ready and the impact of workplace readiness on high school students. In addition, there is an examination of the importance of career and technical education, career pathways, and teacher effectiveness, by means of teacher experience earned while working in business and industry.

Introduction

Education alone does not fully prepare students to enter the workplace. No longer can a student graduate high school, receive a diploma, and have the expectation that he or she is ready to seek employment. Concern over this issue differs depending on the opinions reviewed from educators, employers, community leaders, parents, and government officials. ACT (2006) states “The primary mission of the public education system is to give every student the opportunity to live a meaningful and productive life, which includes earning a wage sufficient to support a small family” (p. 2). Meanwhile, postsecondary educators expect high school graduates to be prepared academically to be successful in the postsecondary setting (ACT, 2005). While “employers continue to call for workers that have the tools [academic and technical] needed to perform well on the job and stay on the job” (The Conference Board, Inc., 2006, para. 1). These points along with a statement from the U.S. Department of Labor (2007) that in the United States today, “all American workers [should] have the opportunity to equip themselves with the necessary tools to succeed in their careers” do not align with reality of students that are not prepared to enter the world of work (para. 8). There is an obvious gap between academic, technical and employability knowledge and skills (Moscon & Thompson, 2013).
A recent study by ACT (2006) concluded that all “high school students should be educated according to a common academic expectation, one that prepares them for both postsecondary education and the workforce” (p. 1). This is found to be important for young people who for various reasons including a bad economy may not be able to find employment in their area of interest, but do find that academic preparation and strong career preferences can better position them to make career choices that are suited for their skills and interests (ACT, 2009). Yet, is it enough? The 2005 National Association of Manufacturers Skills Gap report indicated a shortage of qualified workers from over 80% of their respondents (ACTE, 2008). At a time when there cannot seem to be enough preparation for entering the workforce, our nation is at a critical crossroad of finding the right balance between preparing students academically and preparing students with a skill.

One suggested solution to the issue at hand is career and technical education (CTE). “High-quality CTE programs can ensure America’s future competitiveness through increased student engagement, the innovative integration of math, science and literacy skills, and by meeting the needs of both employers and the economy as a whole” (ACTE, 2006, p. 3). CTE prepares a student academically while focusing on the technical skills that employers require on the job—this enables the student to be work ready. CTE teachers from industry realize “…that high school graduation is not the only target or goal for students. The best teachers are able to support students in a deeper understanding of the field and requirements for success in an industry” (Moscon & Thompson, 2013, p. 19). Therefore, this discussion lends itself to examine how educators and employers measure workplace readiness and its role in high school reform.
Theoretical Framework

The focus of this study is based upon various career development theories, many of which are constructs of researchers (Bandura, 1986; Holland, 1985; Lent, Brown, & Hackett, 1994; and Super, 1942) that have led to the production or enhancement of career programs to increase students’ workplace readiness.

Career Development Theories

The basis of career development theories is to determine why students choose the careers they do. In this study, theories examined focus on the impact of the school environment and how it relates to students’ school-to-work transition. Savickas (1999) explained “youth cope better with the school-to-work transition if as high school students they have developed awareness of the choices to be made and of the information and planning that bear on these choices” (p. 327). The following progression of theories encompass many perspectives that led to Lent, Brown, and Hackett’s (1994) Social Cognitive Career Theory, which will guide this dissertation.

Life-span, life-space theory of careers. Super (1942) introduced life stages as a way to explain many vocational concerns. Realizing that an individual’s adolescent and early adult years play a critical role in providing a foundation from which to learn about career development and all its aspects, Super continued his work for many years. He focused on the relationship of career development to people, their characteristics, and their interactions with the work environment (Salomone, 1996). One could say that he viewed careers and their life course from the developmental, self and contextual perspectives (Savickas, 1997).

This was apparent as over a forty-year period Super’s original theory, “Career Development Theory,” morphed into “Developmental Self-Concept Theory” and then to “Life-
Span, Life-Space Theory” (Savickas, 1997, p. 248). Over time, Super’s theory has continued to be able to answer the questions, “What do people do?” and “Why do they do it?” (p. 253). Super’s model identified the stages one goes through in life as one develops his/her self-concept and applies it to various occupations and/or interests; it is as follows:

1. Stage I: Growth (Birth-14); Substages: Fantasy, interest, capacity
2. Stage II: Exploration (Age 15-24); Substages: Tenative, transition, trial
3. Stage III: Establishment (Age 25-44); Substages: Trial, stabilization, advancement
4. Stage IV: Maintenance (Age 45-64); Substages: Self-fulfillment or frustration
5. Stage V: Decline (Age 65 on); Substages: Deceleration, retirement (Super, 1957, pp. 40-41)

As educators, Stages I and II—Growth and Exploration, are of the greatest importance as to the influence of the curriculum being taught and its relevance to career development.

Teachers’ roles are especially critical in developing students’ self-concepts, as well as, their exposure to various careers and occupations. Thus, Holland’s work provides an extension of the developmental perspective to look more closely at the environmental influence.

**Holland’s theory of vocational choice.** Holland (1985) provides a basis for the study using his widely accepted theory of vocational choice. Identifying six personality types, Holland focused on matching personality with the environment. It was his belief that individuals gravitate toward certain occupations due to their own personal experiences and personality traits. Four assumptions are derived from his original theory:

1. Personalities can be categorized as one of the following: realistic, investigative, artistic, social, enterprising, or conventional.
2. There are six modal environments that reflect the personality types: realistic, investigative, artistic, social, enterprising and conventional.

3. People relate to environments that are conducive to their skills and abilities, allow them to express their attitudes and values, and challenge them with agreeable problems and roles.

4. Behavior is determined by an interaction between personality and environment—one type of personality is usually dominant (Holland, 1985).

   Therefore, students’ personalities ultimately steer them toward a particular environment that helps to cultivate their thoughts, attitudes and abilities. If the environment, which includes the teacher, is conducive toward preparing them academically and technically; then students are more adequately prepared to make informed career decisions related to their skills and interests. Bandura’s work continues to build on this theory to further explain the construct as it relates to this study.

**Social learning theory.** Bandura (1977) identified learning as the foundation of human development in all aspects. He further explained that attitudes, emotional responses, and conduct are byproducts of what someone sees in his/her environment. Bandura (1986) stated that people “are agents of experiences rather than simply under goers of experience” (p. 921). He further explained this with a four-step process: (1) attention—the individual notices an object, event or behavior in the environment; (2) retention—the object, event or behavior is worth remembering; (3) reproduction—the individual replicates the object, event or behavior; (4) motivation—the object, event or behavior sparks a desire for continued repetition (Darity, 2008). It is through these vicarious experiences that individuals mold themselves. Thus, Bandura (1986) changed the
At the core of social cognitive theory is self-efficacy or one’s motivation or belief about his/herself that affects all other aspects of his/her life. “Individuals form their self-efficacy beliefs by interpreting information primarily from four sources: mastery experience, vicarious experience, social persuasions, and physiological reactions” (Anderman, 2009, p. 791). Self-efficacy is extremely critical in students’ developmental years. Whether others’ verbal or nonverbal actions and words are intentional or not, individuals are influenced by them (Anderman, 2009). This is especially important in the classroom setting. Self-efficacy is a pivotal determinant of life choices that students make and of the course of action they pursue as “self-efficacious students work harder, persist longer, persevere in the face of adversity, have greater optimism and lower anxiety, and achieve more” (p. 793). Further, this brings attention to the role of the teacher and his or her responsibility in nurturing the self-efficacy beliefs of students. “As children strive to exercise control over their world, their first transactions are mediated by adults who can empower them with self-assurance or diminish their fledgling self-beliefs” (p. 793). A teacher’s influence over a student is immeasurable and will be further discussed as it relates to this study.

**Social cognitive career theory.** Built from Bandura’s social cognitive theory, social cognitive career theory (SCCT) focuses on three variables: self-efficacy beliefs, outcome expectations, and goals. Developed by Robert Lent, Steven Brown, and Gail Hackett in 1994, SCCT incorporates a variety of concepts including interests, abilities, values, and environmental
factors. It is the analysis of an individual’s educational/career interests, choice and performance that serve as a useful perspective to view the development of basic career attributes and competencies during the school years and beyond (Lent, Brown & Hackett, 1999).

Students, teachers and parents need to be educated on the importance of career development early in a student’s schooling by emphasizing that interests and skills are not static. Instead, they change and grow as the children themselves do as a result of life experiences in and out of school (Lent et al., 1999). Imperatively speaking, it is essential that adult role models realize that many people base their career decisions on factors other than their interests (Lent et al., 1999). Thus, teachers play a critical role in the career development of students. The ability to draw from the teacher’s experience in business and industry, allows him or her to expand on the curriculum and incorporate real-world applications. The more realistic the learning environment is, the more realistic students can be when assessing their interests, abilities, and performance. This is very important as students set goals and expectations for their future careers. Six interrelated processes or work transition interventions are identified as pivotal at various developmental points according to the SCCT perspective when looking at the school-to-work transition. They are as follows:

1. Acquisition of positive yet realistic self-efficacy and outcome expectations
2. Development of academic and career interests
3. The formation of linkages between interests and career-related goals
4. Translation of goals into actions
5. Development of academic and work skills and remediation of performance-related problems, and
6. Negotiation of social supports and barriers that affect the development of self and occupational beliefs and the pursuit of preferred academic/career options. (Lent et al., 1999, p. 300)

Thus, the above mentioned processes or work transition interventions should be addressed while students are in school so that they can identify career development as a life-long journey, not just something that ends once they graduate high school. It is these work transition interventions that in essence assist students in becoming workplace ready and will guide the focus of this study. This includes participation in career and technical education (CTE) and teacher effectiveness by means of teacher experience, including business and industry experience in his/her related field.

**Workplace Readiness**

Workplace readiness or a lack thereof has been an issue in America since the release of the well-known 1983 government report, *A Nation At Risk*. A major concern mentioned then and still today is the inadequate state of public secondary education. Hull (2005) explains, “It no longer serves the majority of American young people by helping them make long-range decisions, choose careers, become good citizens, and prepare for higher education” (p. 1). This research and more emphasizes K-12 education in general is not preparing students to enter the world of work as “only four in 10 high school graduates, at best, are work ready” (Pittman, 2010, p. 6). “The confidence that students and parents place in the diploma contrasts sharply with the skepticism of employers and postsecondary institutions, who all but ignore the diploma, knowing that it often serves as little more than a certificate of attendance” (“Ready or Not,” 2004, p. 1). “The seriousness of this readiness gap—the gap between being fully credentialed and fully
prepared” is a call for action (Pittman, 2010, p. 11).

ACTE (2006) emphasizes that graduates need this level of readiness if they are to succeed in college-level courses without remediation and to enter the workforce training programs ready to learn job-specific skills. ACTE (2008) states “as the global economy has gained strength and businesses and industries increasingly seek employees with higher levels of expertise, a national movement to ensure a steady supply of skilled workers has grown” (p. 1). The question is—has the number of educated, skilled workers increased? Unfortunately, it seems as if that answer is no. Davis (2006) states “the greatest challenge for education in the next quarter century may lie in the demand for a competent skilled workforce that will enable American business and industry to compete in global markets” (p. 22). This is a direct result of what seems to have become a cultural belief for the majority of Americans. They think that if their children are prepared to go to college that it is enough—this belief unfortunately “has not kept pace with the realities of the 21st century” (Daggett, 2002, p. 1).

Students need to graduate high school and college prepared academically, but they must also be technically prepared. Students today need some type of skill because there is currently a skills gap in American businesses. “The effects of the inadequacy of today’s high schools reach well beyond the educational sphere. Employers are well aware of—and increasingly dissatisfied with—the inabilities of secondary (and even postsecondary) graduates to meet the demands of the workplace” (Hull, 2005, p. 5). This skills gap is defined by the American Society for Training and Development Public Policy Report, “Bridging the Skills Gap” as “a significant gap between an organization’s skill needs and the current capabilities of its workforce” (ACTE, 2008, p. 2). The gap has been created by rapidly changing jobs, many of which have been
driven by technological advancements and a competitive global economy. This coupled with an emphasis in schools to prepare students to move on to college, rather than learn a skill has ultimately created an increasing skills gap. The Secretary’s Commission on Achieving Necessary Skills (SCANS) completed a report in 1992 on workplace readiness and noted what they “found most disturbing was that more than half of our young people leave school without the knowledge (competencies) or foundation required to find and hold a good job” (“Learning a Living: A Blueprint for High Performance,” 1992, p. 63).

Hence, there is an urgency to not only increase rigor in public schools, but to also focus on relevance. Teachers must be able to think outside the walls of their classrooms to prepare students for what lies ahead after graduation. A report published jointly by the International Society for Technology in Education (ISTE), the Partnership for 21st Century Skills, and the State Educational Technology Directors Association (SETDA) found that “even if all students mastered core academic subjects, they still would be woefully underprepared to succeed in postsecondary institutions and workplaces, which increasingly value people who can use their knowledge to communicate, collaborate, analyze, create, innovate, and solve problems” (“Maximizing the Impact,” 2007, p. 9). Passing a course is no longer enough; today’s students must be able to apply what they learn, especially in a workplace setting.

Workplace readiness is no longer about basic skills. “…U.S. schools need to fuse the traditional three R’s with the four C’s—critical thinking, communication, collaboration, and creativity—while also making room for problem solving and innovation” (Gordon, 2011, p. 32). This means schools must quit teaching courses as independent silos and start integrating content and knowledge so that it can be applied to the workplace. The report, “Ready or Not: Creating a
High School Diploma That Counts” (2004) explains, “the diploma has lost its value because what it takes to earn one is disconnected from what it takes for graduates to compete successfully beyond high school—either in the classroom or in the workplace” (p. 1). In order for the diploma to serve students and employers, graduation requirements must be aligned to high-demand, high-skill, and high-wage positions.

It seems this is not just an issue in America. An Australian perspective on CTE, or vocational education, focuses on a point by White (1985), “Vocational education needs to address the requirements of the workplace; otherwise it would be quite pointless” (p. 62). Billett’s (2004) review of the state of vocational education in Australia addresses the lack of preparedness of students to go to work and be successful. “Overall, the leadership of business has failed to select and enact policies and practices to advance vocational education in ways commensurate with the significant public resources it has commanded” (p. 14). Varying perspectives all agree that no longer can vocational education be about “identifying and assisting individuals to secure their true course in life: their vocation” (Dewey, 1916, p. 210). Instead it must be about “preparing students to be flexible and skilled” (Billett, 2004, p. 22). Thus, there is a critical need for conversations with businesses to define workplace readiness so that schools can meet the curricular demands to fully prepare students. Schools can no longer assume that connecting students’ interests to potential careers is enough—there has to be a link between schools and the business and industry that they are preparing students to enter.

Therefore, emphasis must be placed on the importance of the business and industry perspective as to what is going on in public school classrooms. In addition, one could see how instructors with business and industry experience may be better prepared to help teach students
to be more workplace ready because they have worked in their respective fields and know what is expected.

The typical curriculum in high schools today includes requirements in academic areas such as mathematics, language arts, science and social studies with offerings in fine arts, physical education, foreign language and career and technical education. In contrast, employers are looking for technical skills and employability skills, coupled with the ability to read, write and communicate (ACTE, 2008). Many of these desired skills are taught in CTE courses; but more often than not, school systems do not require all students to complete coursework in a CTE program area. Yet, it is through CTE programs that students are exposed to technical skills and employability skills, in addition to, an emphasis on reading, writing and communicating.

CTE classes are where engagement and relevance collide to spark students’ interest in their future and career goals. “CTE has been proven to decrease dropout rates and improve academic performance, due in part to instructional methods—such as hands-on, project-based, inquiry-based, and service learning—that provide context to academic subjects” (Hyslop & Imperatore, 2013, p. 18). Thus, legislation is needed to persuade school districts as to the importance of preparing students to be workplace ready. Previous legislation passed includes Goals 2000; Educate America Act of 1994; School-to-Work Opportunities Act of 1994; Workforce Investment Act of 1998; No Child Left Behind Act of 2002; and Carl D. Perkins Career and Technical Education Act of 2006 (ACTE, 2008). Each focused on “increasing and measuring skills needed in education, work and life” (p. 2).

Today, “work ready” and “career ready” are interchangeable terms that no one seems to be able to truly define; as there are many stakeholders responsible for contributing to one’s
ability to be work ready. However, there is one definition that seems to be as accurate as possible. “Career readiness involves three major areas: core academic skills and the ability to apply those skills to concrete workplace situations; employability skills, such as critical thinking and responsibility; and technical, job-specific skills related to a specific pathway” (“What is Career Ready,” 2010, p. 1).

In order to find common ground when assessing whether or not an individual is workplace ready, foundational cognitive and behavioral skills must be evaluated. These skills are transferrable to almost any given job or occupation. Utilizing a database of profiles detailing skill requirements for more than 18,000 jobs across the country, ACT found commonalities in 75% of the jobs requiring employees to have foundational skills in three areas (Guidry, 2012). They are as follows:

1. Reading for Information—the skill required to read and use text in order to do a job;
2. Applied Mathematics—the skill required to apply mathematical reasoning to work-related problems; and
3. Locating Information—the skill required to locate, synthesize and use information from workplace charts, graphs, tables, forms, flowcharts and diagrams. (p. 28)

Behavioral skills address an individual’s work ethic or “soft skill” attainment. Together cognitive and behavioral skills are a winning combination for workplace readiness.

It is the need for more qualified and workplace ready job applicants that has been a driving force behind the concept of a “workforce readiness credential” which has “emerged to attempt to validate work-ready skills” (ACTE, 2008, p. 3). Gaining momentum to become widely used and accepted, national assessments include the ACT National Career Readiness

**Career and Technical Education**

Since the beginning of time, people have understood the importance of having a skill and appreciated crafts that individuals mastered by using their hands. Most of these skills were learned via apprenticeships with family members or masters of their crafts. This way of learning and living continued for many years until the teachings of Aristotle and Plato redefined education. “No longer was learning a physical trade considered education. Aristotle believed the people who ‘do’ are too burdened with their hands to learn how to read or write” (Goodsell, 2005, p. 2). It was at this point in history that a divide was recognized between “those who worked and those that were educated” (p. 2). In many ways today that divide still exists in schools and workplaces.

In America, it was during colonial times that the first education law was passed and vocational training first generated momentum. The Old Deluder Satan Act of the Massachusetts Bay Colony outlined the requirements for masters and apprentices in regard to academics as well as vocational skills (Gordon, 2013). These particular skills would be necessary as the industrial revolution progressed. It was a need for technical skills that the country yearned for then and it is the same need the country desires today—the need for career and technical education. Career and technical education programs “engage and prepare students for postsecondary education and a range of career opportunities by providing core academic, employability and technical skills through an integrated, applied and connected curriculum” (Hyslop & Imperatore, 2013, p. 17).

ACTE (2008) reports that employers desire more “technical skills, strong basic
employability skills, and reading, writing and communication skills” in their employees (p. 2). The National Association of Manufacturers states, “The shortage of qualified workers is truly widespread, impacting companies regardless of size, industry, or geographic location” (ACTE, 2008, p. 2). Therefore, the national efforts of government, education and business/industry are lacking when it comes to addressing the current skills gap.

Vocational education has been considered the avenue for students that wanted to pursue some type of skilled work. The curriculum’s primary purpose was to train students on how to perform a job. This is no longer adequate to survive in the workplace, and one of the main reasons vocational education has been criticized (Hull, 2005). Just as academic classes prepare students to become well-rounded employees, so do vocational/CTE courses. Hull (2005) speaks of two types of education, vocational or job training and academic or test training, stating that “neither of these examples represents good education” (p. 6).

Hull (2005) goes on to discuss that to improve public high schools, six systemic changes must take place. First, students should be required to select an interest area to focus on, such as a career pathway, which helps answer the question, “Why do I have to learn this?” Second, students should be required to complete a plan of study that includes how they will prepare for the next step after high school, whether it is college, military, or employment. Third, students should be required to learn rigorous academics relevant to a career field. Fourth, the curriculum should reflect the students’ interest areas, reflect a program of study leading to a postsecondary path, and incorporate academic, technical and soft skill standards. Fifth, the students’ plans of study should encourage a smooth transition from high school to the next level with dual enrollment and work-based learning opportunities. Lastly, large high schools with over 100
students per grade should be organized by student interest areas or career pathways. These points can all be addressed with career and technical education.

CTE courses prepare students for careers and further educational opportunities by integrating academic rigor with technical skill, which is increasingly becoming more important. Thus, CTE instructors are faced with the challenge of equipping students with skills needed to succeed beyond high school. This has become increasingly more important as data shows that students graduate high school every year without the skills or knowledge needed to succeed (“Ready or Not,” 2004). Consider the following points:

1. Most high school graduates need remedial help in college.
2. Most college students never attain a degree.
3. Most employers say high school graduates lack basic skills.
4. Most workers question the preparation that high schools provide. (p. 3)

Therefore, career and technical education is even more essential in economic times such as these when skilled labor is in high demand. Lewis (2008) concluded that, “to produce higher achievement following high school completion academic components must be strengthened through correlation with vocational relevance” (p. 192). The role of CTE is best stated by ACTE (2008):

CTE is critical in an individual’s journey toward total education and career success.

Whether it is secondary students who need job skills to transition into the workplace, employees who need to upgrade skills, adults who need to achieve new skills for ongoing success or college graduates who want enhanced technical skills, all are served by CTE programs. It is through CTE programs that students, employees and other adults all gain
the full range of skills necessary to be considered ‘workforce ready.’ (p. 3)

Congress emphasized the importance of CTE when reauthorizing the Carl D. Perkins Career and Technical Improvement Act noting that it provides “individuals with opportunities throughout their lifetimes to develop, in conjunction with other education and training programs, the knowledge and skills needed to keep the United States competitive” (ACTE, 2006, p. 1). Congress realized CTE is the vehicle to get the nation moving in the right direction. CTE programs give students the opportunity to learn rigorous concepts coupled with relevance. Hyslop and Imperatore (2013) state, “Students in CTE programs have a clearer perspective of how their coursework relates to their career aspirations, and CTE’s instructional approach helps students learn academic and technical content not by rote, but in an in-depth and meaningful way” (p. 19). Thus, CTE benefits students in numerous ways including integrating academic rigor and technical relevance to help increase students’ opportunities for improved employment and increased earnings over their lifetimes. In addition, CTE helps to reduce dropout rates and absenteeism because students are engaged in what they are learning because it has real-world applicability (ACTE, 2007; Hyslop & Imperatore, 2013). The potential influence is so strong that a University of Michigan study (1998) found that “high-risk students are eight to 10 times less likely to drop out in the 11th and 12th grades if they enroll in a career and technical program instead of a general program” (ACTE, 2007, p. 3). Making the connections in the CTE classroom is critical—connections to rigor, relevance and relationships.

At the center of every CTE classroom is a teacher with the ability to emphasize relevance because the CTE curriculum supports secondary and postsecondary goals of promoting economic competitiveness by developing academic competencies while building employability
The four main goals are as follows:

1. Increase student engagement
2. Improve math, science and literacy skills
3. Meet America’s workforce needs
4. Meet employer needs for high skilled workers (ACTE, 2006)

In order for CTE programs to successfully increase academic competencies and build skill levels, they must be closely aligned to the technical skills that employers are seeking. Therefore, connections with employers are critical to gather valuable feedback from business and industry. Through CTE programs, these conversations take place via advisory committees, career technical student organizations and work-based learning programs.

In addition to focusing on the insights gained from business and industry as to what students need to apply academic and technical skills in the workplace, CTE teachers are committed to helping students develop the required employability skills to be successful. Not only are employability standards integrated into the CTE curriculum, but, the majority of CTE program fields, such as Construction, Government and Public Safety, Healthcare Science, Metals and Transportation require teachers to have previous work experience. Therefore, the teachers themselves know first-hand what employability skills are needed. This is important when it comes to relating the standards that are being taught in the classroom to the actual application of the skill in the workplace.

Georgia requires a minimum of two years of experience in the Trade and Industrial field to earn teacher certification in that area (Georgia Professional Standards Commission, Rule 505-2-.96). Arizona requires proof of 6,000-plus hours/experience in industry to receive a
provisional certificate to teach (Todd, 2013). Montana does not require a bachelor’s degree if an applicant can document at least 10,000 hours of work experience in certain areas where there is a shortage of CTE educators (Fritsch, 2013). Therefore, most CTE teachers should be keenly aware of business and industry needs because of their backgrounds in their respective areas. “Individuals coming from industry have the advantage of being able to bring their experience into the classroom by taking the textbook and making the material real and relevant” (Bloomfield & Foster, 2013, p. 24).

**Career Cluster/Pathways**

Career and technical education is an umbrella that covers a variety of career clusters/pathways and programs of study. Hyslop and Imperatore (2013) state “Career pathways and programs of study that form a coherent sequence of relevant, career-focused courses are a central element of CTE’s success” (p. 19). The National Career Clusters recognized by most of the United States covers 16 areas. They are as follows:

1. Agriculture, Food and Natural Resources
2. Architecture and Construction
3. Arts, A/V Technology and Communications
4. Business Management and Administration
5. Education and Training
6. Finance
7. Government and Public Administration
8. Health Science
9. Hospitality and Tourism
10. Human Services
11. Information Technology
12. Law, Public Safety, Corrections and Security
13. Manufacturing
14. Marketing
15. Science, Technology, Engineering and Mathematics

Under those career clusters over 80 career pathways are identified. “A career pathway is a coherent, articulated sequence of rigorous academic and career/technical courses, commencing in the ninth grade and leading to an associate degree, baccalaureate degree and beyond, an industry-recognized certificate, and/or licensure” (Hull, 2005, p. 15).

The Georgia Department of Education has adopted the 16 national career clusters, as well as added one additional cluster, Energy. Any additional pathways that are recognized, such as Fine Arts and Foreign Language pathways are decisions of the local school boards and considered non-CTE. As an organizing tool for curriculum design and instruction, the 17 career clusters and approximately 96 CTE career pathways provide essential knowledge and skills for the students’ career pathways (Georgia Career, Technical and Agricultural Education, 2013). This model serves the purpose of the following:

1. Useful guide in developing programs of study that bridge secondary and postsecondary curriculum.

2. Indicator of a range of career options for students’ graduation plans of study.
3. Method of allowing students to discover their interests and passions, empowering them to choose the education pathway that may lead to success in high school, college and career. (Georgia Career, Technical and Agricultural Education, 2013, p. 1)

Utilizing the career clusters as a guide, each career pathway was developed to include courses that were agreed upon as important by secondary and postsecondary teachers, administrators and business and industry representatives. The career pathway itself includes three or four sequenced courses in a relevant area. Each career pathway course includes the following:

1. Academic Common Core Curriculum to ensure consistency across states
2. Alignment with national assessments and student credentialing programs
3. Relevant content
4. Higher-order thinking skills
5. Rigorous technical knowledge and skills
6. Soft skills (Georgia Career, Technical and Agricultural Education, 2013, p. 3)

The goal of the career pathway is to provide focused career exposure to high school students so that the transition into postsecondary education and/or work is seamless. “Career Pathways ensure that all students have a strong academic foundation in English, math, social studies and science, linked to state standards, and that courses are taught in the context of careers to make them more relevant to students” (Hull, 2005, p. 8). The desire is that students will become much more informed and make educated decisions when planning for their future.
Teacher Effectiveness/Teacher Experience

Social cognitive career theory emphasizes the importance of self-efficacy, outcome expectations, and goals. The role of the CTE teacher in this process is critical as many efficacy-enhancing interventions are helpful in the “context of work exposure programs or where students are learning new job-specific skills and refining generic skills” (Lent et al., 1999, p. 307). It is known that many factors influence students’ career direction other than their interests—one of these factors is their teacher (Lent et al., 1999). Teachers have the opportunity to provide mastery experiences, project-based learning, observational learning, and verbal persuasion to foster beliefs about career decision-making.

Prideaux (2003) in a study on adolescent career education interventions concluded that “the world of work knowledge” was important to raise students’ awareness and expand their options (p. 78). Bloomfield and Foster (2013) state “If we know the fastest growing careers, have established CTE programs aligning to the demand, and we have students eager and ready to learn these in-demand skills, there is only one thing missing: A highly skilled and knowledgeable instructor…” (p. 23). Teachers with business and industry experience have first-hand knowledge of what is required on the job. Experienced teachers can teach and speak from their experience in the workplace to provide a realistic picture of the skills that are needed to be successful.

Teachers influence students on a daily basis—they can use “positive persuasion” to “encourage and empower” students or the opposite to “weaken self-efficacy beliefs” (Anderman, 2009, p. 792). Teachers can motivate students to see that their actions will have desired outcomes. CTE teachers can directly relate students’ actions and abilities to the workplace setting. “Academics are often presented in isolation, instead of in a way that shines a spotlight on
how the subject is applicable in the context of the real world” (ACTE, 2007, p. 4). CTE however has real-world applicability; and teachers can use that to motivate students in a meaningful, positive way. For example, the construction teacher who shows the importance of math skills in daily construction work is able to reach the student who lacks motivation in math class alone. Teachers can show students that the knowledge and skills they learn play a critical role in what they can and cannot do when they graduate. Effective CTE teachers know their students’ capabilities and how to encourage them to use those abilities to be successful in the workplace (Moscon & Thompson, 2013).

In a report titled, “Ready or Not: Creating a High School Diploma That Counts” (2004) a manufacturing and distribution executive was quoted as saying:

Increasingly, the computer will do the computation…[but] thinking about the problem, developing the problem, understanding the problem, looking at it from all sides, deciding what important information is relevant to the problem…is the hard part….You can’t do that without an understanding of the computation. (p. 2)

This statement indicates that teaching the concept is no longer enough; teachers must be able to teach the concept and why it matters in regards to the bigger picture. Todd (2013) states that teachers that enter education after working for years in industries such as automotive, culinary arts, interior design and HVAC among others, “bring an expertise that cannot be replicated by someone with a teaching degree and no experience in that particular field” (p. 27). The role of a teacher cannot be underestimated, especially one that is experienced in the area he/she is teaching.

Moscon and Thompson (2013) discuss that CTE teachers in the 21st century face “a wide
array of possibilities when it comes to students, subjects, levels of understanding and available resources” (p. 17). Realizing that there is not a one-size-fits-all description for CTE teachers, the authors refer to Benjamin Franklin when he said, “experience is the best teacher” stating “we have found that it could instead be said that experience makes the best teachers” (p. 17).

The Oregon Department of Education’s Secondary/Postsecondary Transitions Team conducted an informal study of high-quality CTE programs in an attempt to identify the attributes that make a program stand out. Four schools and four program areas—agriculture, computer graphics, engineering, and health occupations, were visited and asked the questions “What’s working and how can we do more of it?” (Moscon & Thompson, 2013, p. 18). Observations of classes and interviews with key stakeholders were used to find commonalities among high-quality programs. The team stated, “Our findings across all four programs recognize the importance of industry experience in a teacher’s background” (p. 18). In addition, the team recognized that seven common elements emerged. They are as follows:

1. Fostering student professionalism
2. Providing authentic experiences
3. Utilizing an extensive network of professionals
4. Engaging in self-directed student learning
5. Promoting a culture of next steps
6. Designing lessons that scaffold and build on career skills
7. Teaching from an industry perspective (p. 19)

Conclusions indicated that “teachers who come to CTE as experienced members of business and industry are able to draw connections between academics and commerce, between
theory and application” (Moscon & Thompson, 2013, p. 20). These instructors are able to better prepare students for the real world because they have been there and know what it takes to succeed.

Yu (2010) discusses the idea of learning from industry in the area of professional communication. “If we want to help students succeed in workplace communication—however ‘success’ is defined by a workplace institution—we must understand how employees and their performance are assessed and deemed successful in those institutions” (p. 22). Thus, the point is made that teachers need experience and training in business and industry to fully prepare students in their classrooms for what lies ahead of them after graduation. Yu (2010) states, “workplaces have developed their own methods…by understanding and learning from these methods, business communication teachers can combine the best that classrooms and workplaces have to offer” (p. 36).

Therefore, the role of the career and technical educator is especially critical today. Davis (2006) states, “Career and technology educators at all levels must fully understand the functioning of today’s high performance workplaces. Failure to do so could hinder production gains and economic growth” (p. 23). CTE teachers can meet these demands by motivating students, focusing on individualizing instruction, providing service learning, participating in co-curricular student organizations, and enabling active learning. The Gates Foundation states that “all students need adult mentors who know them, look out for them, and push them to achieve” (ACTE, 2007, p. 5). All the constructs of SCCT are found in CTE as mentoring and providing positive relationships are hallmarks of each program through co-curricular organizations. “CTE links students to the community in ways that many other high school programs cannot” (p. 5).
The common denominator between the student and the CTE program in which they are enrolled is the teacher.

Gentry, Peters, and Mann (2007) conducted a study where gifted and talented students were surveyed on their experiences in CTE vs. core subject classes. Four themes were identified: student autonomy; effective, caring teachers; students with similar interests; and learning relevant content in an interactive, applied setting. In addressing effective, caring teachers, “student comments showed that they valued the connections that many of the instructors had in their field” (p. 388). This further clarified that students gain from experiences for which they can see the importance because they are directly linked to the field or profession in which they are interested. In a personal interview conducted during the study, a student in the information technology class described his teacher as the greatest strength of his program stating, “It makes a difference that he’s done this type of work. I know there are teachers that are masters at what they do, they just can’t teach it. Mr. W has both of those…that’s the good part about CTE—they have both” (p. 388). Overall the study showed that students most frequently commented on the quality of their teachers as being a factor leading to their success. “Students connect to teachers who care about them, they engage when taught content in a meaningful, applied setting, and they value autonomy and opportunities to work with staff and others that share similar interests” (pp. 395-396). Simply put, teachers and their experiences matter.

CTE teachers are the key to using rigor, relevance and relationships to support students in their pursuit of career success. Teachers with business and industry experience have the ability to link learning in the classroom to future job application. Instructors that start teaching when they graduate college are competent in content knowledge, but cannot share experiences from the
workplace (Fritsch, 2013). CTE educators understand how to apply their business and industry experience to prepare students to be workplace ready. Further, CTE teachers use the workforce credentials to drive instruction, improve student achievement, and make connections that matter. “CTE programs play critical roles in the growth of workforce readiness credentials by helping students apply skills, providing opportunities for preparation and assessment, and connecting with business and industry” (ACTE, 2008, p. 4).

In order for high school students to be characterized as workplace ready and to be successful on workplace readiness assessments, learning must take place in an environment that reflects the workplace—thus, the CTE classroom is the place to make it happen. “CTE provides such an environment where students can apply fundamental academic skills and employability skills to complex job-related problems” (ACTE, 2008, p. 4). The teacher is the facilitator of this necessary learning and the more workplace familiar the teacher, the more real-world experiences he/she can provide for students in preparing them to be workplace ready. Fritsch (2013) states it best, “if we aren’t preparing these students for the industry and industry standards, then why are we teaching?” (p. 33).

**Conclusion**

Workplace readiness is a necessity. Workforce readiness credentials are a way of demonstrating one’s skill level, academic and technical, as well as overall workplace readiness. CTE is instrumental in preparing students for both—the assessment and the workplace.

CTE courses inherently provide contexts for applied or experiential learning…delivery of content area curricula within a relevant, authentic, and presumably more motivating context…the creation of explicit connections between situations is critical if students are
to transfer their knowledge and skills outside the classroom, whether it is to another context or to an abstract-testing situation. (ACTE, 2008, p. 4)

The teacher’s role and background in facilitating this process is a critical component to the overall preparedness of a student to be considered workplace ready. This study sought to fill a void in the present literature linking teacher experience in business and industry to the workplace readiness of high school students.
CHAPTER THREE: METHODOLOGY

The issue of students graduating high school without adequate academic or skill preparation to enter the workforce is a cause for concern. This is a problem many school districts are facing; therefore, this study sought to identify trends that contribute to students graduating more workplace ready. To examine the workplace readiness of high school students, the impact of teacher experience in business and industry and the relationship that this experience may have on students’ workplace readiness scores was examined. Thus, this causal-comparative study investigated the possible influence of teacher experience in business and industry on the workplace readiness of high school students.

An explanation of the methods used to execute this study is presented in Chapter Three. Descriptions of the following are included: the design, participants, setting, instrumentation, and proposed procedures to carry out the design and how data will be analyzed to answer the research questions.

Research Design

This quantitative study utilized a causal-comparative research design to determine if the workplace readiness scores of high school students were impacted by teacher experience in business and industry. This study’s design focused on independent variables (IV) and dependent variables (DV) which were presented as scale and level scores. The independent variable in this study was career pathway teachers’ experience in business and industry. There were two levels—two or more years of experience in business and industry and less than two years of experience in business and industry. The dependent variable in this study was the workplace readiness of high school students based on students’ scale scores on the ACT WorkKeys®
individual assessments; Applied Mathematics, Locating Information, and Reading for Information, as well as the overall level score earned. Data gathered for this study was *ex post facto* to ensure that there was no manipulation of the data.

**Research Questions**

The following research questions guided this study:

- **Research Question 1:** Is there a difference in the ACT WorkKeys® Applied Mathematics scale scores of students who have completed a career pathway taught by a teacher with two or more years of business and industry experience and those whose teachers do not have two or more years of business and industry experience?

  Null Hypothesis (Ho1): There is no statistically significant difference in the scale scores on the ACT WorkKeys® assessment in Applied Mathematics between high school students who have completed a career pathway taught by a teacher with two or more years of business and industry experience and those completing a career pathway taught by a teacher without two or more years of business and industry experience.

- **Research Question 2:** Is there a difference in the ACT WorkKeys® Locating Information scale scores of students who have completed a career pathway taught by a teacher with two or more years of business and industry experience and those whose teachers do not have two or more years of business and industry experience?

  Null Hypothesis (Ho2): There is no statistically significant difference in the scale scores on the ACT WorkKeys® assessment in Locating Information between high school students who have completed a career pathway taught by a teacher with two or more years of business and
industry experience and those completing a career pathway taught by a teacher without two or more years of business and industry experience.

Research Question 3: Is there a difference in the ACT WorkKeys® Reading for Information scale scores of students who have completed a career pathway taught by a teacher with two or more years of business and industry experience and those whose teachers do not have two or more years of business and industry experience?

Null Hypothesis (Ho3): There is no statistically significant difference in the scale scores on the ACT WorkKeys® assessment in Reading for Information between high school students who have completed a career pathway taught by a teacher with two or more years of business and industry experience and those completing a career pathway taught by a teacher without two or more years of business and industry experience.

Research Question 4: Is there a difference in the ACT WorkKeys® overall level scores of students who have completed a career pathway taught by a teacher with two or more years of business and industry experience and those whose teachers do not have two or more years of business and industry experience?

Null Hypothesis (Ho4): There is no statistically significant difference in the overall level scores on the ACT WorkKeys® assessment between high school students who have completed a career pathway taught by a teacher with two or more years of business and industry experience and those completing a career pathway taught by a teacher without two or more years of business and industry experience.

Research Question 5: Is there a difference in the ACT WorkKeys® overall level scores of CTE career pathway completers and non-CTE career pathway completers?
Null Hypothesis (Ho5): There is no statistically significant difference in the overall level scores on the ACT WorkKeys® assessment between high school students who have completed a CTE career pathway and high school students who have completed a non-CTE career pathway.

Participants

This study used a nonprobability convenience sample. Participants were students identified as career pathway completers enrolled in the two high schools of a school district located in northwest Georgia during the school terms 2009-2010, 2010-2011 and 2011-2012 that took the ACT WorkKeys® assessment. In addition to taking the assessment, all participants completed a career pathway, which involves three or more courses in a state or locally approved sequence. Career pathways considered in this study were Agriculture, Business, Construction, Education, Engineering, Fine Arts, Foreign Language, Government and Public Safety, Healthcare Science, Marketing, Metals, and Transportation. Students who moved into the system without meeting the career pathway requirement were not included in the study.

The sample consisted of 594 participants. There was no manipulation of the variables; all data used occurred prior to the study and were not dependent on the use of a control or treatment group. No participant was excluded from the study based on population group identifiers including, but not limited to ethnicity, gender, socio-economic status, special education status, gifted status, or English Language Learner identification.

Setting

The research study was conducted in a northwest Georgia public school district. The district consists of six elementary schools, two middle schools, two high schools, and a residential facility. According to the Georgia Department of Education in 2010-2011,
enrollment included 7,326 students consisting of 1% Asian, 15% African American, 17% Hispanic, 65% Caucasian, and 3% Multiracial (2013). Also, disaggregated among the student population are subgroups reflecting 14% students with disabilities, 8% limited English proficiency, and 64% free and reduced lunch.

The latest information reported by the U.S. Census Bureau (2011) states that the county in which the school district is located has approximately 41,211 residents. The county is within 85 miles of three large metropolitan areas in Georgia, Tennessee and Alabama. In 2011, 11.4% of the county’s population had a Bachelor’s degree or higher compared to the state average of 27.2%. The median household income is $38,646 with 19.3% of the residents living below the poverty level. The unemployment rate for the county in 2011 was 10.5% (U.S. Census Bureau, 2011).

Data gathered in this study was captured from PowerSchool®, the school district’s student information system. ACT WorkKeys® assessment scores were collected from reports released from the local technical college, which is the ACT WorkKeys® testing agent for the school district.

Instrumentation

ACT, formerly known as American College Testing, is an organization well-known for college entrance exam testing that has made great strides in rebranding the company over the past few years to incorporate a broader range of testing. According to the website, ACT founder E.F. Lindquist wanted to focus on “practical knowledge rather than cognitive reasoning” (ACT, 2014, “Our Story,” para. 1). Therefore, ACT helps assess individuals in the realm of training and learning for school and the workplace. For this study, the ACT WorkKeys® assessment was
used. “Developed with input from employers, labor organizations, educators, and policymakers, ACT’s WorkKeys® assessments are criterion-referenced tests anchored to the skills needed for workforce readiness” (ACT, 2006, p. 3). There are eight WorkKeys® assessments available for use including: Reading for Information, Applied Mathematics, Listening, Writing, Applied Technology, Locating Information, Teamwork, and Observation (ACT, 2002). Three of those assessments, Applied Mathematics, Locating Information, and Reading for Information are required to earn an ACT National Career Readiness Certificate™, as well as a Georgia Work Ready Certificate.

Scores on the WorkKeys® assessments are derived by the number of questions answered correctly and interpreted by five levels of difficulty. “Level 3 is the least complex and Level 7 is the most complex. The levels build on each other, each incorporating the skills assessed at the preceding levels” (ACT, 2012c, para. 1). Each assessment includes a scale score ranging from 65 to 90 that is interpreted into a level score of <3 to 7 (ACT, 2012a). These level scores are often “used by employers for selection, promotion or other high-stakes purposes” and are identified by bronze, silver, gold and platinum (ACT, 2006, p. 9). Table 1 represents each assessment’s level score and corresponding scale scores.
### Table 1

**ACT WorkKeys® Assessments Level Scores and Scale Scores**

<table>
<thead>
<tr>
<th>Level</th>
<th>Applied Mathematics Scale Score</th>
<th>Reading for Information Scale Score</th>
<th>Locating Information Scale Score</th>
</tr>
</thead>
<tbody>
<tr>
<td>Level &lt;3</td>
<td>65-70</td>
<td>65-72</td>
<td>65-71</td>
</tr>
<tr>
<td>Level 3 Bronze</td>
<td>71-74</td>
<td>73-74</td>
<td>72-74</td>
</tr>
<tr>
<td>Level 4 Silver</td>
<td>75-77</td>
<td>75-78</td>
<td>75-79</td>
</tr>
<tr>
<td>Level 5 Gold</td>
<td>78-81</td>
<td>79-81</td>
<td>80-86</td>
</tr>
<tr>
<td>Level 6 Platinum</td>
<td>82-86</td>
<td>79-81</td>
<td>80-86</td>
</tr>
<tr>
<td>Level 7 Platinum</td>
<td>87-90</td>
<td>85-90</td>
<td></td>
</tr>
</tbody>
</table>

**Note.** Level <3 indicates a score not high enough to earn an overall certificate. The maximum score that can be reached is a Level 6 for the Locating Information Assessment; therefore, no scale score is listed for Level 7 for that particular assessment. Adapted from “Conversion Tables” by ACT, Inc. (ACT, 2012a).

ACT and independent researchers have established the validity and reliability of the WorkKeys® assessment. In 2002, findings were reported in a White Paper on WorkKeys® Validation. Attention was placed on the criteria from which all WorkKeys® system tests were designed; they are as follows:
1. The way in which the generic skill is assessed is generally congruent with the way the skill is used in the workplace.

2. The lowest level assessed is at approximately the lowest level for which an employer would be interested in setting a standard.

3. The highest level assessed is at approximately the level beyond which specialized training would be required.

4. The steps between the lowest and highest levels are large enough to be distinguished and small enough to have practical value in documenting workplace skills.

5. The assessments are sufficiently reliable for high-stakes decision making.

6. The assessments can be validated against empirical criteria.

7. The assessments are feasible with respect to administration time and complexity, as well as cost. (ACT, 2002, p. 9)

**Validity**

Validity encompasses a three-part model according to Guion (1980) of content validity, construct validity, and criterion-related validity. The technical manuals for ACT’s WorkKeys® assessments also indicate the three above mentioned types of validity as justification of the validity of their assessments. “In 2010, ACT commissioned two external experts to evaluate the WorkKeys® system relative to the EEOC’s 1978 Uniform Guidelines on Employee Selection Procedures as well as more current professional standards” (ACT, 2012b, para. 1). The following conclusions were published concerning the valid use of WorkKeys® assessments as a result of the evaluation:
1. The validity of the use of WorkKeys® tests as selection criteria may properly be shown by using a content validation approach, which is the approach that is typically used by employers utilizing the WorkKeys® job profiling process. The job profiling component involves subject matter experts who work with a trained facilitator to identify key tasks, skills, and skill levels necessary to perform the applicable position(s); the validation is thus employer-specific. This content validation approach is a professionally acceptable method of establishing validity as contemplated in the Uniform Guidelines.

2. The content validity of the WorkKeys® system relative to the Uniform Guidelines can also be shown by using the U.S. Department of Labor’s own database of job titles and corresponding skills, the Occupational Information Network, or O*NET. A detailed comparison of O*NET TASKS, ABILITIES, and WORK ACTIVITIES profiled for jobs at two representative employers who have used WorkKeys® confirmed that the WorkKeys® assessments assessed important skills and abilities for the jobs in question, as contemplated under the Uniform Guidelines.

3. An employer’s use of the National Career Readiness Certificate™ can also be shown to be valid under current professional standards without the need for a local validity study, based on meta-analytic validity generalization research and related research. The cumulative research findings of numerous professionals over many years, including the 30 years of research that has taken place since the Uniform Guidelines were released in 1978, show that the WorkKeys® system meets the requirements for criterion-related validity, content validity, and construct validity, through application
of validity generalization research findings and related research. (ACT, 2012b, para. 1)

Reliability

Gall, Gall and Borg (2007) define reliability as it relates to classical test theory as the “amount of measurement error in the scores yielded by the test” (p. 651). Measurement error is defined as “the difference between an individual’s true score on a test and the scores that the individual actually obtains on it when it is administered over a variety of conditions” (p. 644). For the purposes of this study, all students have been tested under similar conditions by ACT-trained test administrators.

ACT evaluated the reliability of test scores of a sample of 244,124 high school students using various estimation techniques. Internal consistency and reliability coefficients were examined by form for each assessment. Results indicated a .82 for Form A and .90 for Form B of the Reading for Information assessment (ACT, 2008c); .92 for both Forms A and B for the Applied Mathematics assessment (ACT, 2008a); and .79 for Form A, .83 for Form B, and .79 for Form C of the Locating Information assessment (ACT, 2008b). Gall et al. (2007) state that “tests that yield scores with a reliability of .80 or higher are sufficiently reliable for research purposes” (p. 200).

Procedures

Application for approval to conduct the study was made to the school district and Liberty University’s Institutional Review Board (IRB). Once permission was granted, data collection began. Data was collected from the student information system, PowerSchool® as to what career pathway each student completed. Although, Trade and Industrial teachers are the only
teachers required to have business and industry experience, it was possible that teachers in the other program areas may possess business and industry experience in their respective field.

Employment Verification Forms, completed as a component of the hiring process, were reviewed to report previous business and industry work experience so that comparison groups could be established. The following groups were established: CTE pathways taught by teachers with two or more years of business and industry experience, CTE pathways taught by teachers without two or more years of business and industry experience, non-CTE pathways taught by teachers with two or more years of business and industry experience, and non-CTE pathways taught by teachers without two or more years of business and industry experience.

Once students were divided into the appropriate categories based on the career pathways completed, ACT WorkKeys® assessment data was collected for each student. There was no manipulation of the variables, as all data used in this study occurred prior to data collection.

**Data Analysis**

An analysis of the descriptive statistics of the workplace readiness scores of high school students who have completed a career pathway taught by an instructor with two or more years of experience in business and industry compared to the workplace readiness scores of high school students who have completed a career pathway taught by an instructor without two or more years of experience in business and industry is presented in this study. The research questions and hypotheses in this study refer to continuous and level data in the form of scale and level scores on the ACT WorkKeys® assessment.

Data was collected and arranged in four categories: students who have completed a CTE career pathway taught by an instructor with two or more years of experience in business and
industry; students who have completed a CTE career pathway taught by an instructor without two or more years of experience in business and industry; students who have completed a non-CTE career pathway taught by an instructor with two or more years of experience in business and industry; and students who have completed a non-CTE career pathway taught by an instructor without two or more years of experience in business and industry. For the purposes of this study, ACT WorkKeys® assessment data included the level of the overall certificate earned and scale scores for the Applied Mathematics, Locating Information, and Reading for Information assessments. Assessment data for the four student groups was examined by the level score, overall certificate earned and the scale score on each individual assessment.

This study called for collection of both continuous data and level data on each student. Therefore, t-tests for independent means were used to test the difference of means in regard to the scale scores on the ACT WorkKeys® assessments addressing research questions one, two and three. In addition, the study employed the chi-square statistical test to evaluate level data on the ACT WorkKeys® assessment addressing research questions four and five. Both statistical measures provided insight as to whether or not scores were related to teacher experience in business and industry.

Gall et al. (2007) state that a t-test for independent means is “a procedure for determining whether the observed difference between the means of two groups on variable X is statistically significant” (p. 655). Chi-square ($X^2$) is “a nonparametric statistical test to determine whether research data in the form of frequency counts are distributed differently for different samples” (p. 325). Significance was determined at the .05 level due to the size of the groups being studied. Information was gathered in a Microsoft Excel spreadsheet and then imported into Statistical
Product and Service Solutions (SPSS) software to run applicable statistical tests. The null hypotheses for research questions one, two, and three were evaluated by comparing the mean, standard deviation, $t$-value, and corresponding $p$-value with alpha set at .05. The null hypotheses for research questions four and five were evaluated using Chi-square ($X^2$) analysis to determine if the level values differed in their distribution. An effect size was established to measure the difference that exists between the groups measured.
CHAPTER FOUR: FINDINGS

This chapter presents the findings on the analysis of ACT WorkKeys® assessment data from 594 high school students. The study’s purpose was to determine if there is a difference between the workplace readiness scores of high school students that complete a career pathway taught by an instructor with two or more years of experience in business and industry compared to the workplace readiness scores of those completing a career pathway taught by an instructor without two or more years of experience in business and industry. Statistical tests employed include t-tests and chi-square tests with significance determined at an alpha level of .05. The findings of this study are outlined by their related research questions.

Research Question 1

Is there a difference in the ACT WorkKeys® Applied Mathematics scale scores of students who have completed a career pathway taught by a teacher with two or more years of business and industry experience and those whose teachers do not have two or more years of business and industry experience?

Ho1: There is no statistically significant difference in the scale scores on the ACT WorkKeys® assessment in Applied Mathematics between high school students who have completed a career pathway taught by a teacher with two or more years of business and industry experience and those completing a career pathway taught by a teacher without two or more years of business and industry experience.

A t-test for independent samples was used to test the null hypothesis. The dependent variable was students’ ACT WorkKeys® Applied Mathematics scale scores. The grouping variable was the teachers’ years of business and industry experience. The grouping variable had
two categories: teachers who had less than two years of business and industry experience and teachers who had two or more years of business and industry experience. The Levene’s test for equality of variances was not significant, $F (1, 592) = .08, p = .779$. Therefore, the equality of variance assumption of the $t$-test was met and the $t$-test that assumed equal variances was used.

The $t$-test was not significant, $t (592) = 1.44, p = .150$. Therefore, the null hypothesis was retained. There was no difference between the ACT WorkKeys® Applied Mathematics scale scores of students who completed a career pathway taught by teachers with less than two years of business and industry experiences and students who completed a career pathway taught by teachers with two or more years of business and industry experience. The effect size, as measured by $\eta^2$, was small ($< .01$). In other words, less than 1% of the variance in students’ ACT WorkKeys® Applied Mathematics scale scores was accounted for by teachers’ years of business and industry experience. There was only a half point difference between the applied mathematics mean for students who had teachers with two or more years of experience ($M = 77.12, SD = 4.34$) and students who had teachers with less than two years of business and industry experience ($M = 77.64, SD = 4.35$) as shown in Table 2. Figure 1 illustrates the boxplots for the distributions of students’ ACT WorkKeys® Applied Mathematics scale scores by their teachers’ years of business and industry experience.
Table 2

*Means, Standard Deviations and t-tests (Applied Mathematics)*

<table>
<thead>
<tr>
<th>Group</th>
<th>n</th>
<th>M</th>
<th>SD</th>
<th>t</th>
<th>p</th>
</tr>
</thead>
<tbody>
<tr>
<td>Less than two years of business and industry experience</td>
<td>291</td>
<td>77.64</td>
<td>4.35</td>
<td>1.44</td>
<td>1.50</td>
</tr>
<tr>
<td>Two or more years of business and industry experience</td>
<td>303</td>
<td>77.12</td>
<td>4.34</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

ο = An Observation between 1.5 times to 3.0 times the Interquartile Range

*Figure 1*. Boxplots for ACT WorkKeys® Applied Mathematics scale scores by teachers’ years of experience in business and industry.
Research Question 2

Is there a difference in the ACT WorkKeys® Locating Information scale scores of students who have completed a career pathway taught by a teacher with two or more years of business and industry experience and those whose teachers do not have two or more years of business and industry experience?

Ho2. There is no statistically significant difference in the scale scores on the ACT WorkKeys® assessment in Locating Information between high school students who have completed a career pathway taught by a teacher with two or more years of business and industry experience and those completing a career pathway taught by a teacher without two or more years of business and industry experience.

A t-test for independent samples was used to test the null hypothesis. The dependent variable was students’ ACT WorkKeys® Locating Information scale scores. The grouping variable was the teachers’ years of business and industry experience. The grouping variable had two categories: teachers who had less than two years of business and industry experience and teachers who had two or more years of business and industry experience. The Levene’s test for equality of variances was not significant, $F (1, 592) = .48, p = .488$.

The t-test was not significant, $t (592) = 1.07, p = .285$. Therefore, the null hypothesis was retained. There was no difference between the ACT WorkKeys® Locating Information scale scores of students who completed a career pathway taught by teachers with less than two years of business and industry experiences and students who completed a career pathway taught by teachers with two or more years of business and industry experience. The effect size, as measured by $\eta^2$, was small ($< .01$). There was only a quarter point difference between the
locating information mean for students who had teachers with two or more years of experience ($M = 76.75, SD = 3.06$) and the mean for students who had teachers with less than two years of business and industry experience ($M = 77.01, SD = 2.79$) as shown in Table 3. Figure 2 illustrates the boxplots for the distributions of students’ ACT WorkKeys® Locating Information scale scores by their teachers’ years of business and industry experience.

Table 3

Means, Standard Deviations and t-tests (Locating Information)

<table>
<thead>
<tr>
<th>Group</th>
<th>n</th>
<th>M</th>
<th>SD</th>
<th>t</th>
<th>p</th>
</tr>
</thead>
<tbody>
<tr>
<td>Less than two years of business and industry experience</td>
<td>291</td>
<td>77.01</td>
<td>2.79</td>
<td>1.07</td>
<td>.285</td>
</tr>
<tr>
<td>Two or more years of business and industry experience</td>
<td>303</td>
<td>76.75</td>
<td>3.06</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Research Question 3

Is there a difference in the ACT WorkKeys® Reading for Information scale scores of students who have completed a career pathway taught by a teacher with two or more years of business and industry experience and those whose teachers do not have two or more years of business and industry experience?

Ho3: There is no statistically significant difference in the scale scores on the ACT WorkKeys® assessment in Reading for Information between high school students who have completed a career pathway taught by a teacher with two or more years of business and industry experience and those completing a career pathway taught by a teacher without two or more years of business and industry experience.
A *t*-test for independent samples was used to test the null hypothesis. The dependent variable was students’ ACT WorkKeys® Reading for Information scale scores. The grouping variable was the teachers’ years of business and industry experience. The grouping variable had two categories: teachers who had less than two years of business and industry experience and teachers who had two or more years of business and industry experience. The Levene’s test for equality of variances was not significant, $F(1, 592) = .86, p = .355$.

The *t*-test was not significant, $t(592) = 1.93, p = .055$. Therefore, the null hypothesis was retained. There was no difference between the ACT WorkKeys® Reading for Information scale scores of students who had teachers with less than two years of business and industry experiences and students who had teachers with two or more years of business and industry experience. The effect size, as measured by $\eta^2$, was small (.01). There was only a half point difference between the reading for information mean for students who had teachers with two or more years of experience ($M = 79.90, SD = 2.98$) and students who had teachers with less than two years of business and industry experience ($M = 80.35, SD = 2.70$) as shown in Table 4. Figure 3 illustrates the boxplots for the distributions of students’ ACT WorkKeys® Reading for Information scale scores by their teachers’ years of business and industry experience.
Table 4

*Means, Standard Deviations and t-tests (Reading for Information)*

<table>
<thead>
<tr>
<th>Group</th>
<th>n</th>
<th>M</th>
<th>SD</th>
<th>t</th>
<th>p</th>
</tr>
</thead>
<tbody>
<tr>
<td>Less than two years of business and industry experience</td>
<td>291</td>
<td>80.35</td>
<td>2.70</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>1.93</td>
<td>.055</td>
</tr>
<tr>
<td>Two or more years of business and industry experience</td>
<td>303</td>
<td>79.90</td>
<td>2.98</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Figure 3. Boxplots for ACT WorkKeys® Reading for Information scale scores by teachers’ years of experience in business and industry.
Research Question 4

Is there a difference in the ACT WorkKeys® overall level scores of students who have completed a career pathway taught by a teacher with two or more years of business and industry experience and those whose teachers do not have two or more years of business and industry experience?

Ho4: There is no statistically significant difference in the overall level scores on the ACT WorkKeys® assessment between high school students who have completed a career pathway taught by a teacher with two or more years of business and industry experience and those completing a career pathway taught by a teacher without two or more years of business and industry experience.

The chi-square test was used to evaluate the null hypothesis that there was no difference in the overall level scores on the ACT WorkKeys® assessment between high school students who have completed a career pathway taught by a teacher with two or more years of business and industry experience and those completing a career pathway taught by a teacher without two or more years of business and industry experience. The independent variable, teachers’ years of business and industry experience, had two categories: students who had teachers without two years of experience and students with teachers who had two or more years of experience. The dependent variable, the overall level scores on the ACT WorkKeys® assessment, had four distinctions: less than 3; bronze; silver; and gold. The assumptions of the chi-square test were met: none of the cells had an expected frequency of less than five and the minimum expected frequency was greater than one (24.01).
The chi-square was not significant, Pearson $\chi^2(3) = 3.98$, $N = 594$, $p = .264$. Therefore, the null hypothesis was retained. The strength of the relationship between teachers’ years of experience in business and industry and the overall level scores, as measured by Cramer’s $V$, was weak (.08). As shown in Table 5, for each level of the overall scores there was little difference between the percentage of students completing career pathways taught by teachers who had less than two years business and industry experience and the percentage of students completing career pathways taught by teachers with two or more years of experience. The largest percentage difference was for the less than 3 level, meaning no certificate was earned, which only had a difference of four percentage points between students who had teachers with less than two years of experience (6.2%) and students who had teachers with more than two years of experience (10.2%). Students who had scores categorized as Gold had only a 2.8 percentage point difference between students with teachers who had less than two years of experience (13.4%) and students with teachers who had more than two years of experience (10.6%). For both the bronze and silver levels, there was less than one percentage point difference between students who had teachers with less than two years of business and industry experience and students with teachers who had two or more years of experience.
Table 5

*Overall Level Scores by Teacher Business and Industry Experience*

<table>
<thead>
<tr>
<th>Level</th>
<th>Teachers’ Years of Business and Industry Experience</th>
<th>Less than 2 years</th>
<th>Two or more years</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>n</td>
<td>%</td>
</tr>
<tr>
<td>&lt; 3</td>
<td></td>
<td>18</td>
<td>6.2</td>
</tr>
<tr>
<td>Bronze</td>
<td></td>
<td>62</td>
<td>21.3</td>
</tr>
<tr>
<td>Silver</td>
<td></td>
<td>172</td>
<td>59.1</td>
</tr>
<tr>
<td>Gold</td>
<td></td>
<td>39</td>
<td>13.4</td>
</tr>
<tr>
<td>Total</td>
<td></td>
<td>291</td>
<td>100.0</td>
</tr>
</tbody>
</table>

**Research Question 5**

Is there a difference in the ACT WorkKeys® overall level scores of CTE career pathway completers and non-CTE career pathway completers?

Ho5: There is no statistically significant difference in the overall level scores on the ACT WorkKeys® assessment between high school students who have completed a CTE career pathway and high school students who have completed a non-CTE career pathway.

The chi-square test was used to evaluate the null hypothesis that there was no difference in the ACT WorkKeys® overall level scores of CTE career pathway completers and non-CTE career pathway completers. The independent variable, career pathway status, had two categories: non-CTE career pathways and CTE career pathways. The dependent variable, the overall level scores on the ACT WorkKeys® assessment, had four distinctions: less than 3;
bronze; silver; and gold. The assumptions of the chi-square test were met: none of the cells had an expected frequency of less than five and the minimum expected frequency was greater than one (16.91).

The chi-square was not significant, Pearson $\chi^2 (3) = 3.55, N = 594, p = .315$. Therefore, the null hypothesis was retained. The strength of the relationship between students’ completed career pathway status and the students’ overall level scores, as measured by Cramer’s $V$, was weak (.08). As shown in Table 6, for each level of the overall scores there was little difference between the percentage of students completing a non-CTE pathway and the percentage of students completing a CTE pathway. The largest percentage difference was found in the gold category which only had a difference of 4.8 percentage points between students who completed a CTE career pathway (10.3%) and students who completed a non-CTE career pathway (15.1%). Students who had scores categorized as Silver had only a 2.5 percentage point difference between students who completed a CTE career pathway (59.6%) and students who completed a non-CTE career pathway (57.1%). The less than 3 and bronze levels found even lower percentage point differences between students who completed a CTE career pathway and students who completed a non-CTE career pathway.
Table 6

*Overall Level Scores by Career Pathway Status*

<table>
<thead>
<tr>
<th>Career Pathway Status</th>
<th>Non-CTE Career Pathways</th>
<th>CTE Career Pathways</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>n</td>
<td>%</td>
</tr>
<tr>
<td>&lt; 3</td>
<td>14</td>
<td>6.8</td>
</tr>
<tr>
<td>Bronze</td>
<td>43</td>
<td>21.0</td>
</tr>
<tr>
<td>Silver</td>
<td>117</td>
<td>57.1</td>
</tr>
<tr>
<td>Gold</td>
<td>31</td>
<td>15.1</td>
</tr>
<tr>
<td>Total</td>
<td>205</td>
<td>100.0</td>
</tr>
</tbody>
</table>

**Conclusion**

This chapter presented the findings of the *t*-tests and chi-square tests conducted on the ACT WorkKeys® assessment scores of 594 high school students. Results were presented by research question. The following chapter provides discussion on the interpretations and inferences derived from the data.
CHAPTER FIVE: DISCUSSION

This chapter presents a summary of the study, an overview of the problem, and a review of the methodology. Also, conclusions and implications based on the findings of the study are noted. In closing, limitations will be discussed as well as recommendations for further study and research.

Summary of the Study

This study examined the ACT WorkKeys® scores of 594 high school students in the graduating classes of 2010, 2011, and 2012 in a northwest Georgia school district to see if there was a difference in the scale and level scores of those completing a career pathway taught by a teacher with two or more years of business and industry experience and those taught by a teacher without two or more years of business and industry experience. In addition, level scores were assessed to see if a difference existed between students completing CTE career pathways and those completing non-CTE pathways.

Overview of the Problem

Over the past several decades, students in America have left high school inadequately prepared to enter the workforce (A Nation at Risk, 1983; Secretary’s Commission on Achieving Necessary Skills; 1991; Goals 2000: Education America Act of 1994; School-to-Work Opportunities Act of 1994; Workforce Investment of 1998; and ACTE, 2008). School districts have sought ways to increase rigor and relevance to better prepare students for college and careers. One avenue was to provide career and technical education instruction in the form of coherent, sequenced courses known as career pathways (ACTE, 2008). Career pathway teachers have the responsibility to align what is being taught in the classroom to the skills that are needed
by business and industry. Thus, it is concluded that those with experience in business and industry are more knowledgeable and skilled when it comes to preparing a more workplace ready student (Bloomfield & Foster; 2013; Moscon & Thompson, 2013).

The literature review revealed that “only four in 10 high school graduates, at best, are work ready” (Pittman, 2010, p. 6). This point emphasizes that a readiness gap does indeed exist and if students are to succeed in college-level courses without remediation and to enter workforce training programs ready to learn job-specific skills that it must be addressed (ACTE, 2006). One way to do this is to expose students to career and technical education courses. By providing career and technical instruction, students’ academic knowledge is strengthened through correlation to real-world relevance producing higher achievement (Lewis, 2008). Results of such achievement are indicated by workplace readiness assessments such as the instrument used in this study, ACT WorkKeys®. Based on this background, data was collected and examined for any contributions provided toward workplace readiness by teacher experience in business and industry and career and technical education.

**Purpose**

The purpose of this study was to examine the differences in the scale and level scores of the ACT WorkKeys® assessment for high school students that completed a career pathway taught by a teacher with two or more years of business and industry experience and those taught by a teacher without two or more years of business and industry experience. Also included was the examination of the difference in level scores of students completing CTE career pathways and those completing non-CTE pathways. Career pathways included in the study were categorized in the following program areas: Agriculture; Architecture, Construction, and
Technology; Fine Arts; Foreign Language; Government and Public Safety; Healthcare Science; and Marketing, Sales and Service. The intent of the study was to analyze the data to see if a difference exists in the workplace readiness scores of those taught by teachers with two or more years of business and industry experience and those without two or more years of business and industry experience in regard to Georgia Professional Standards Commission Rule 505-2.96—requiring CTE teachers in fields such as Trade and Industry to have a minimum of two years of business and industry experience.

**Review of Methodology**

This study employed a causal comparative design utilizing $t$-tests and chi-square tests to indicate the difference between the workplace readiness scores—scale and level, of students completing a career pathway taught by teachers with two or more years of experience and those without two or more years of business and industry experience. Also included in the examination was the difference in the level scores of those students completing CTE career pathways and those completing non-CTE career pathways.

The study included examining the student records of 594 students in the graduating classes of 2010, 2011 and 2012. Student data was gathered in a spreadsheet indicating the career pathway the students completed and the students’ respective ACT WorkKeys® scale scores in Applied Mathematics, Locating Information, and Reading for Information; as well as, their overall earned level score: <3, bronze, silver, gold, or platinum. Teacher data was collected in a spreadsheet indicating the school, career pathway, and CTE/non-CTE status. Group numbers were assigned to the career pathways as follows: Group 1, CTE career pathways taught by teachers with two or more years of business and industry experience; Group 2, CTE career
pathways taught by teachers without two or more years of business and industry experience; Group 3, non-CTE career pathways taught by teachers with two or more years of business and industry experience; and Group 4, non-CTE career pathways taught by teachers without two or more years of business and industry experience. The student and teacher data were merged to create a spreadsheet for import into SPSS, using the following fields: group number, Applied Mathematics scale score, Locating Information scale score, Reading for Information scale score, and overall level score.

**Findings and Discussion**

The findings for this study were presented in Chapter Four of this dissertation. The discussion of those findings will be presented in this section according to the five research questions that guided the study.

**Research Question 1**

Is there a difference in the ACT WorkKeys® Applied Mathematics scale scores of students who have completed a career pathway taught by a teacher with two or more years of business and industry experience and those whose teachers do not have two or more years of business and industry experience?

To answer Research Question 1, the following null hypothesis was considered:

Ho1: There is no statistically significant difference in the scale scores on the ACT WorkKeys® assessment in Applied Mathematics between high school students who have completed a career pathway taught by a teacher with two or more years of business and industry experience and those completing a career pathway taught by a teacher without two or more years of business and industry experience.
Examination of this null hypothesis found that the $t$ test was not significant, $t (592) = 1.44, p = .150 \ (N = 594)$; therefore, the null hypothesis was retained. The findings of this data indicate that there was no difference in the ACT WorkKeys® Applied Mathematics scale scores of students completing a career pathway taught by a teacher with two or more years of business and industry experience and those taught by a teacher without two or more years of business and industry experience.

**Research Question 2**

Is there a difference in the ACT WorkKeys® Locating Information scale scores of students who have completed a career pathway taught by a teacher with two or more years of business and industry experience and those whose teachers do not have two or more years of business and industry experience?

To answer Research Question 2, the following null hypothesis was considered:

$Ho2$: There is no statistically significant difference in the scale scores on the ACT WorkKeys® assessment in Locating Information between high school students who have completed a career pathway taught by a teacher with two or more years of business and industry experience and those completing a career pathway taught by a teacher without two or more years of business and industry experience.

Examination of this null hypothesis found that the $t$ test was not significant, $t (592) = 1.07, p = .285 \ (N = 594)$; therefore, the null hypothesis was retained. The findings of this data indicate there was no difference in the ACT WorkKeys® Locating Information scale scores of students completing a career pathway taught by a teacher with two or more years of business and
industry experience and those taught by a teacher without two or more years of business and industry experience.

**Research Question 3**

Is there a difference in the ACT WorkKeys® Reading for Information scale scores of students who have completed a career pathway taught by a teacher with two or more years of business and industry experience and those whose teachers do not have two or more years of business and industry experience?

To answer Research Question 3, the following null hypothesis was considered:

\[ H_{03} : \text{There is no statistically significant difference in the scale scores on the ACT WorkKeys® assessment in Reading for Information between high school students who have completed a career pathway taught by a teacher with two or more years of business and industry experience and those completing a career pathway taught by a teacher without two or more years of business and industry experience.} \]

Examination of this null hypothesis found that the \( t \) test was not significant, \( t (592) = 1.93, p = .055 \) (\( N = 594 \)); therefore, the null hypothesis was retained. The findings of this data indicate there was no difference in the ACT WorkKeys® Reading for Information scale scores of students completing a career pathway taught by a teacher with two or more years of business and industry experience and those taught by a teacher without two or more years of business and industry experience.

The findings from research questions one, two and three focus attention on the Georgia Professional Standards Commission Rule 505-2-.96 requiring teachers in the Trade and Industrial fields to have a minimum of two years of experience in their respective business and
industry to obtain teaching certification. Likewise, other states such as Arizona and Montana require CTE teachers to have a minimum number of hours/experience to earn certification (Fritsch, 2013; Todd, 2013). These requirements align with a study conducted by the Oregon Department of Education that found that teachers with industry experience in their background were the hallmark of quality CTE programs (Moscon & Thompson, 2013). Therefore, quality CTE programs led by experienced teachers are assumed the key to infusing workplace readiness skills into high schools today (Bloomfield & Foster, 2013). It is this recognition of the importance of experience in business and industry by state credentialing agencies, as well as, relevant literature that asserts further research.

**Research Question 4**

Is there a difference in the ACT WorkKeys® overall level scores of students who have completed a career pathway taught by a teacher with two or more years of business and industry experience and those whose teachers do not have two or more years of business and industry experience?

To answer Research Question 4, the following null hypothesis was considered:

$H_0^4$: There is no statistically significant difference in the overall level scores on the ACT WorkKeys® assessment between high school students who have completed a career pathway taught by a teacher with two or more years of business and industry experience and those completing a career pathway taught by a teacher without two or more years of business and industry experience.

Examination of this null hypothesis included using a cross tabulated table and the chi-square test to evaluate the overall level scores based on teacher years of business and industry
experience—less than two and two or more. The chi-square test was not significant, Pearson $\chi^2(3) = 3.98$, $N = 594$, $p = .264$; therefore, the null hypothesis was retained. Results indicated minimal differences in the level scores of students taught by teachers with two or more years of business and industry experience and those taught by teachers with less than two years of experience. The greatest difference was four percentage points in the less than 3 category, meaning no certificate was earned between those with teachers with two or more years of experience in business and industry (10.2%) and those without two or more years of experience (6.2%). The findings of this data indicate that teacher years of experience—two or more or less than two—does not contribute to the overall level scores of students on the ACT WorkKeys® assessment.

The analysis of research questions one, two, three, and four indicates there are no causal patterns found between teacher experience in business and industry and the workplace readiness scores, individual or overall, of high school students. These findings contribute to a gap in the literature that currently exists regarding research studies on the influence of teachers with business and industry experience and workplace readiness. Lent et al. (1994) laid the foundation with the social cognitive career theory to emphasize the teacher’s role in promoting workplace readiness, observing that experiences affect choices when considering career options, in addition to social persuasion and the influence of role models in decision-making. The CTE teacher’s role has been found to be critical in this process by linking academic and career and technical curriculum in an interactive, applied setting (ACTE, 2008; Fritsch, 2013; Moscon & Thompson, 2013; Yu, 2010). Gentry et al. (2007) found that the quality of a student’s teacher and his or her experiences are leading factors to post-high school success. It is the teacher’s ability to make
relevant connections to the workplace based on previous experience that is assumed to play a primary role in influencing students and warrants further investigation.

**Research Question 5**

Is there a difference in the ACT WorkKeys® overall level scores of CTE career pathway completers and non-CTE career pathway completers?

To answer Research Question 5, the following null hypothesis was considered:

Ho5: There is no statistically significant difference in the overall level scores on the ACT WorkKeys® assessment between high school students who have completed a CTE career pathway and high school students who have completed a non-CTE career pathway.

Examination of this null hypothesis included using a cross tabulated table and the chi-square test to evaluate the overall level scores based on completion of CTE or Non-CTE career pathways. The chi-square test was not significant, Pearson $\chi^2 (3) = 3.55, N = 594, p = .315$; therefore, the null hypothesis was retained. Results indicated small differences in the level scores of those completing a CTE career pathway compared to those who completed a non-CTE career pathway. The gold category had the largest percentage difference of 4.8 percentage points with 10.3% of CTE pathway completers and 15.1% of non-CTE pathway completers earning Gold certificates. The findings of this data indicate that there is no difference in the ACT WorkKeys® level scores of students completing CTE career pathways and those completing non-CTE pathways.

While the findings of research question five did not reflect a difference in the overall level scores of the ACT WorkKeys® assessments of CTE career pathway completers and non-CTE completers, the data merits further discussion. The labels of the assessments that make up
ACT WorkKeys®, Applied Mathematics, Locating Information, and Reading for Information, direct one to assume the tests may gauge mostly academic content. Such assumptions, contribute to what literature sums up as a popular belief among critics of CTE and vocational education—that CTE courses do not prepare students to the degree in which academic courses do (Flowers, 2000; Gray, 2002, 2004; Parker, 2011). Whereas, CTE students typically enter the secondary setting less prepared than the non-CTE students, the “achievement gap is small or insignificant by the time they graduate” (Gray, 2004, p. 130; Parker, 2011). It is because of this supposition that students taking only academic courses are considered to be superior compared to those that complete a career pathway or concentration considered primarily technical in nature (Gray, 2002). The data in this study does not support these conventions, but rather finds when it comes to workplace readiness that CTE and non-CTE career pathway completers are similar in comparison.

**Limitations of the Study**

This study examined 594 high school students’ scores on the ACT WorkKeys® assessment. Students selected were seniors at the time they took the assessment in the graduating classes of 2010, 2011, and 2012. All students in the study were seeking a college preparatory diploma and had completed a career pathway as part of the district’s graduation requirements. Each pathway was taught by a subject-specific, certified teacher. This enabled teacher experience groups as well as CTE and non-CTE groups to be established; therefore, employing a convenience sample. Students not completing a career pathway for various reasons were not included in the study. The data included in the study was collected using PowerSchool® and is therefore limited by this student record database.
Geographics should also be considered a limitation of the study as data collected was limited to one northwest Georgia school district. This narrowed the number of participants eligible for the study. In addition, the career pathways that were identified for the study were restricted to the existing course offerings during the 2010, 2011, and 2012 school terms. This limited the available program areas to identify teachers and relevant business and industry experience. Another consideration is the school district bias toward completion of a career pathway. The school district in this study requires that all students complete a career pathway which is a local school board decision, above and beyond state graduation requirements. Thus, participants in this study have been exposed to the importance of career planning as part of their graduation plan. This bias is not cause for concern in this study, but would be a consideration for external validity if comparing data to other school districts.

Lastly, the design employed in this study is causal-comparative analyzing *ex post facto* data to determine the effects of teacher experience and completion of CTE and non-CTE career pathways on the workplace readiness scores of high school students. The disadvantage of the causal-comparative design is that it is difficult to interpret findings related to specific causal patterns (Gall et al., 2007). While the elimination of all outside influences is almost an impossible task, the researcher has taken precautions to reduce such influences related to interpretations of the study data.

**Implications for Practice**

The research findings presented in this study found no significant differences in the workplace readiness of students completing career pathways taught by teachers with two or more years of business and industry experience and those taught by teachers without two or more
years of business and industry experience. In addition, results found no significant difference in the workplace readiness of students completing CTE career pathways and those completing non-CTE pathways. The foundation by which CTE and teacher experience promotes workplace readiness was laid by Lent, Brown, and Hackett’s (1994) Social Cognitive Career Theory (SCCT), observing that experiences, social interactions, and role models greatly influence those making career decisions. Thus, the focus of this study was to examine the constructs of SCCT by looking at teacher experience and CTE as indicators of workplace readiness. In addition, the researcher sought to examine Georgia Professional Standards Commission Rule 505-2-.96; whereas, teachers in Trade and Industrial Fields must have two or more years of experience in their respective field to be able to teach. This study failed to show that teacher experience, measured by a minimum of two years in business and industry, or completion of a CTE career pathway is indicative of a student being more workplace ready as measured by the ACT WorkKeys® assessment.

While the findings of this study may not be generalized for all students, teachers, and school districts, it should be noted that the overall level scores of the 594 students that took the ACT WorkKeys® align with workplace readiness scores of all high school examinees that took the assessment between 2006 and 2011. In a recent report, “The Condition of Work Readiness in the United States” (2013), ACT broke down the level scores of the 1.8 million high school students that had previously tested. Results indicated that zero percent of students earned Platinum certificates compared to the zero percent of students in this study. In addition, 18% earned Gold certificates, where 12% in this study earned gold; and 47% gained Silver certification, whereas 58.8% in this study earned silver. Bronze certificates were earned by 22%
of students across the U.S. compared to 21% in this study, and 13% didn’t score high enough to earn a certificate compared to the 8.2% in the study at-hand that failed to earn work readiness certification. Therefore, the results of this study align with research stating that “the greatest challenge for education lies in the demand to produce a competent, skilled workforce that will allow American business and industry to compete in global markets” in the 21st century (Davis, 2006, p. 22; ACT, 2013; Daggett, 2002). Thus, the findings indicate that additional studies should be considered to continue attempts to bridge the readiness gap that is prominent across the school district in this study, as well as the United States.

**Recommendations for Further Research**

The concern surrounding the state of workplace readiness among high school graduates and those entering the workforce is a problem that will not soon subside. This study focused on teacher experience related to career and technical education and its effects on workplace readiness, but there are many other influences that serve as a basis for future inquiry. Suggestions for further study are as follows:

1. There is a present gap in the literature regarding teacher experience in business and industry and its effects on workplace readiness. Although this study yielded no significant results, further study on the topic is suggested in the form of a correlational study where results are compared based on the actual number of teacher years of experience in business and industry.

2. A replication of this study should be conducted to include all high schools in Georgia that administered the ACT WorkKeys® assessment during 2009 and 2012 to allow for fewer limitations of the study, resulting in more generalizable findings.
3. The study at-hand compared the workplace readiness scores of those completing a three or four course sequence CTE career pathway and those completing a three or four course sequence non-CTE career pathway. A study should be conducted to compare the workplace readiness scores of students completing college preparatory graduation requirements and students completing technical preparatory graduation requirements to analyze the effects of four years of designated courses versus three or four in a pathway, controlling for students’ grade point averages prior to entering high school.

4. Lent, Brown and Hackett’s (1994) Social Cognitive Career Theory emphasizes experiences, social influences and role models as major factors on the career development process. A qualitative study surveying student perspectives based on the constructs of SCCT would allow more insight on the influences that inform career decisions.

**Conclusion**

The purpose of this study was to examine the workplace readiness scores of students completing a career pathway taught by a teacher with two or more years of experience in business and industry and those completing a career pathway taught by a teacher without two or more years of business and industry experience. In addition, there was an examination of the workplace readiness scores of students completing a CTE career pathway and those completing a non-CTE career pathway. The research addressed a gap in the literature regarding teacher experience in business and industry and the effects of such on the workplace readiness of high school students. While this study did not find significant results related to the effects of teacher
experience on the workplace readiness of high school students, it does bring light to a nationwide concern—how to create a more prepared workforce to compete globally in the 21st century.
October 30, 2013

Katherine M. Thomas
IRB Exemption 1708.103013: The Effects of Teacher Experience on the Workplace Readiness of High School Students

Dear Katherine,

The Liberty University Institutional Review Board has reviewed your application in accordance with the Office for Human Research Protections (OHRP) and Food and Drug Administration (FDA) regulations and finds your study to be exempt from further IRB review. This means you may begin your research with the data safeguarding methods mentioned in your approved application, and that no further IRB oversight is required.

Your study falls under exemption category 46.101 (b)(4), which identifies specific situations in which human participants research is exempt from the policy set forth in 45 CFR 46:

(4) Research involving the collection or study of existing data, documents, records, pathological specimens, or diagnostic specimens, if these sources are publicly available or if the information is recorded by the investigator in such a manner that subjects cannot be identified, directly or through identifiers linked to the subjects.

Please note that this exemption only applies to your current research application, and that any changes to your protocol must be reported to the Liberty IRB for verification of continued exemption status. You may report these changes by submitting a change in protocol form or a new application to the IRB and referencing the above IRB Exemption number.

If you have any questions about this exemption, or need assistance in determining whether possible changes to your protocol would change your exemption status, please email us at irb@ liberty.edu.

Sincerely,

Fernando Garzon, Psy.D.
Professor, IRB Chair
Counseling

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REFERENCES


