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## **ACT WorkKeys as an Indicator of Academic Success**

Lucretia Kennedy Williams

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ACT WorkKeys as an indicator of academic success

By

Lucretia Williams

A Dissertation  
Submitted to the Faculty of  
Mississippi State University  
in Partial Fulfillment of the Requirements  
for the Degree of Doctor of Philosophy  
in Community College Leadership  
in the Department of Leadership and Foundations

Mississippi State, Mississippi

December 2015

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2015

ACT WorkKeys as an indicator of academic success

By

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The purpose of this study was to examine the effectiveness of ACT WorkKeys assessments as an indicator of student success within the community college. The number of companies that are utilizing ACT WorkKeys as an indicator to determine work readiness has increased. As community colleges are challenged with training the current workforce for jobs that are in demand, skills gaps that exist have caused challenges that have created difficulties meeting these demands. Due to the responsibilities of the community college to train the workforce explored in this study will be the outcome of ACT WorkKeys as a mechanism that could assist with bridging the current skills gap.

The research was conducted using ACT WorkKeys assessments in the areas of Applied Mathematics, Locating Information, and Reading for Information. The combination of level scores on these assessments yields a National Career Readiness Level certification. Degree-seeking community college career technical students were administer these ACT WorkKeys assessments during the spring 2009 – fall 2012 semesters to determine if their National Career Readiness Level of attainment was an

indicator of their success in avoiding remediation classes, completing their program of study, and obtaining employment.

A quantitative research design utilizing Pearson's Chi Square was used to determine if differences existed. Data included WorkKeys scores, college English and math course placement, program of study completion, and job placement.

Findings revealed that significant differences existed with the National Career Readiness Level attainment, as derived from the level attainment results of Applied Mathematics, Locating Information, and Reading for Information assessments, and student placement in college level English and reading courses. Other findings indicated differences were not existent between National Career Readiness Level attainment and program of study completion nor job placement.

Recommendations include conducting further research within other community colleges observing other variables that could affect course placement, program of study completion, and job placement.

## DEDICATION

This dissertation is dedicated to my two sons, Zachary and Brandon. “It is my hope that the completion of this milestone in my life will motivate you to never stop working to complete all of your dreams. Never let anyone discourage you from what you are capable of achieving.”

## ACKNOWLEDGEMENTS

I am most humbled and grateful for this blessing of God's favor on me, for with God all things are possible. Words cannot express how thankful I am for the support that my family has given me throughout this process. To my husband Micheal, "thank-you for all of your encouragement and support over the past six years as I traveled to class as well as spent numerous hours studying." Zachary and Brandon, "thank you for always encouraging me and expressing how proud you were that your mother was going to be a 'doctor'." To my parents, John and Laneice Kennedy, I thank you for instilling in me the importance of an education at an early age.

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To God Be the Glory!

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## CHAPTER I

### INTRODUCTION

With the changes that are occurring in the demands for a skilled workforce, the present economy currently consists of a population that is lacking the necessary skills that are required to fulfill the current skill demands. “Technology and increased globalization have, on the one hand, reduced the number of low-skilled jobs and, on the other, provided opportunities for high-skilled manufacturing employment to expand” (Deitz & Orr, 2006, p. 7). American workers do not possess the skills that are essential for the jobs that currently exist, nor those that will generate future opportunities. Currently, workforce demand and supply is not proportioned (Conway & Giloth, 2013). Advances in technology, current economic demands and globalization are being credited for this gap between labor supply and demand (World Bank, 2012). The Secretary’s Commission on Achieving Necessary Skills (SCANS) was established to define the skills that were required by business and industries in order for individuals to be classified as work ready (SCANS, 2000). SCANS main intent was to encourage a high-performance market, represented by high-skill, high-wage jobs (SCANS, 2000). Outcomes based on the SCANS report have aided educational institutions as well as businesses on ways to advance workplace training necessities.

Rural community colleges aid in supplying significant economic development resources for local communities. This is beneficial in most rural areas where there are

shortages of educated populations (Strange, 2011). Career technical education has been faced with the challenge of supplying educational training that has been determined to be necessary for personal economic balance and employment success (Moore, Chisholm, & Shulock, 2012). Topping the list of skills that are most important to an employer include: listening, critical thinking, and oral and written communication. Employees who are deficient in these skills will not be able to compete in a skilled-based economy (Griffin, 2012). The quality of a state's or community's human resource base is a major incentive to all industries. "If the local human resource base is substantial, either new firms will be created or existing firms will migrate there" (Blakely & Bradshaw, 2002, p. 69).

An advanced skilled level workforce is necessary in order to be competitive in today's economy. Measures proposed to predict college and career readiness include assessments of English and math skills. American College Testing (ACT) WorkKeys is a job skills evaluation system that aids employers with their hiring process to include: selection, hiring, professional development, and retention. This series of tests determines the presence of foundational skills that have been determined necessary to meet industry needs (ACT, n.d.a.).

As part of ACT's Work Readiness System, ACT WorkKeys has aided millions of individuals in both secondary and post-secondary institutions as well as business and industry build their skills to increase global competitiveness and develop successful career pathways. Successful completion of ACT WorkKeys assessments in Applied Mathematics, Locating Information, and Reading for Information can lead to earning ACT's National Career Readiness Certificate (ACT NCRC), a portable credential earned by more than 2.3 million people across the United States (ACT, 2014).

## Statement of the Problem

The problem leading to this study, as identified by ACT's report *A Better Measure of Skills Gap*, is a substantial section of today's labor force does not have the necessary skills needed by employers (ACT, 2011). According to the Bureau of Labor Statistics (BLS), professions that require workers to have an associate degree are on the rise more rapidly than occupations that require other types of preparation (Moncarz & Crosby, 2005). As the mandate for more technical and vocational graduates surge, it is essential for the rural community college to maintain and graduate students who are enrolled in these high-demand programs of study. This gap between demand of well-paying jobs and supply of unskilled workers continues to be a problem. Therefore, in a rapidly changing world, employers are in need of employees with high performance capabilities for today's jobs and who are ready to face the challenges of the future demands of a globalized economy.

With the shifting of an economy from a manufacturing base to that of one that is more technologically advanced, community colleges have been faced with the challenge of providing the necessary training and education that would allow individuals to transition into an employable status, possessing the skills that are necessary to fill employers demand. These skills include critical thinking, communication, problem solving and leadership abilities. This is a necessity if employers plan to be competitive in this era of globalization. Employers in many fields have a critical need for filling job openings that are increasingly complex and demanding. Unfortunately, many individuals who might be interested in applying for these jobs have little education and work

experience and are not currently qualified to fill these positions (Symonds, Schwartz, & Ferguson, 2011).

The community college's mission is "to provide access to postsecondary educational programs and services that lead to stronger, more vital communities" (Vaughan, 2006, p. 3). Rural community colleges play a critical role in the economic health of communities by ensuring that workers have the skills industries need to remain competitive in the global economy (Cohen, 1995). Because not all students who enter a rural community college later enroll in a university or 4-year college, it is critical that they are provided with occupational training programs that will allow them to be successful. Providing this type of training allows the rural community college to become more functional and integrated into the community (Cohen & Brawer, 2003).

The ACT WorkKeys assessment system was developed as an instrument to effectively measure the skills workers need to be efficient and successful in the workplace. It is a valuable tool in assisting with employment selection and promotion needs (ACT, n.d.b.). ACT WorkKeys research primary focus has highlighted the assessment of individual job skill levels, remediation of deficits, and variable that exist and contribute to the level at which the individual scores. Because it is the responsibility of the community college to train and equip a more technological workforce, further investigation is required to examine if differences exist in student performance based on an individual's ACT WorkKeys level and English and math course placement as well as successful community college career technical program of study completion and job placement.

## **Purpose of the Study**

Because there is concern about workforce readiness and entering college students, the purpose of this study was to determine if ACT WorkKeys can be utilized as an assessment to predict the success of rural community college career technical student's at a community college in rural Mississippi. This area was selected due to there not being a sufficient amount of previous research on the success of students who obtain the various levels that ACT WorkKeys yields. Findings in a study performed by ACT recommend that all high school students should be educated according to a universal educational standard that prepares them for both postsecondary education and the workforce (ACT, 2006a).

The principal purpose of this quantitative research is to determine if differences exists with students' ACT WorkKeys level attainment in Applied Mathematics, Locating Information, and Reading for Information and course placement in mathematics and English, community college program of study completion, and job placement. Existing information analyzed included ACT WorkKeys scores, course placement, program completion, and job placement.

Many states are now using ACT WorkKeys and Career Readiness Certificates as a tool to determine college and career readiness of high school students. Research specifies that the skills required for workforce training beyond high school are equivalent to those demanded of a first-year college student (ACT, 2012a). Because career technical education programs are being held to a high rate of accountability of graduating skilled individuals who fit the demands of business and industry, data researched will be that of career technical education students at a rural community college in Mississippi.

## **Research Questions**

The following research questions were used to help guide the student to examine factors that determine what differences, if any, exists between ACT WorkKeys and student success:

1. Are there differences in academic placement in math and English among students with different National Career Readiness levels?
2. Are there differences in rates of program of study completion among students with different National Career Readiness levels?
3. Are there differences in the number of job placements among students with different National Career Readiness levels?

## **Definitions of Terms**

1. ACT – American College Testing Center’s assessment that determines a students' academic competence for college (ACT, n.d.a.).
2. ACT WorkKeys – ACT WorkKeys is a job skills assessment system in the nation, measuring “real world” foundational skills that are critical to job success. These skills are valuable for any occupation — skilled or professional — and at any level of education. Employers use the system to determine hiring qualifications and training needs. ACT WorkKeys measures work skills in Reading for Information, Applied Mathematics, Locating Information, Applied Technology, Writing, Listening, Teamwork, and Observation. These skills are needed at some level in almost every job, occupation or career in today's economy. For this study, only Reading for Information, Applied Mathematics, and Locating

Information will be used. The combination of these three assessment determines career readiness levels (ACT, 2006a).

3. Career Technical Education - defined by the Carl D. Perkins Vocational and Technical Education Act as organized education programs offering a series of courses toward Specific Labor Market Preparation (Gray & Walter, 2001)
4. Community college—a two-year accredited institution of higher education that offers one-year and two-year vocational certificates and two-year career technical and academic programs of study (Vaughan, 2006).
5. National Career Readiness Certificate (NCRC) is credential that certifies essential skills needed for workplace success by testing three foundational skills: Applied Mathematics, Locating Information, and Reading for Information (ACT, 2014).

### **Theoretical Framework**

The theoretical framework used in this study is Bandura's (1986, 1995, 1997) social cognitive theory. This theory was developed by Bandura (1986) and has been used to provide a possible explanation of the process people use to regulate thoughts, feelings, motivation, and actions. Social cognitive theory makes two major assumptions. First, people act in their own self-interest by being proactive, self-reflective, and by self-regulating their behavior in order to accomplish tasks. Second, people have the capacity to take an active part in shaping their environment rather than having the environment dictate the way they behave (Bandura, 1986).

The idea of self-efficacy is the backbone of the social cognitive view of human

behavior. Bandura (1997) stated “(u)nless people believe they can produce desired effects by their actions, they have little incentive to act” (p. 3). Self-efficacy, the belief that one can produce a desired effect, acts upon the other factors which influence behavior.

As applied in this study, this theory holds that ACT WorkKeys is expected to influence the dependent variables of career readiness, course placement, program completion and job placement. The association of personal performance measures alters individual beliefs in one’s self; alluding that ACT WorkKeys scores are influential in ones theories relating to academic abilities (Bandura, 1986; Pajares, 1996).

### **Limitations**

1. This study used existing data, previously reported to the community college board.
2. This study examined ACT WorkKeys scores for participants located at one specific rural community college to measure student success. Therefore, the results of this study will only be applicable to that college.
3. This study did not separate the participants into categories based on race or gender. Results will only be pertinent to the students at one specific rural community college.

### **Delimitations**

This study was subjected to the following delimitations:

1. This study was limited to the students in one Mississippi’s rural community college.

2. This study was limited to degree seeking career technical students.

### **Significance of the Study**

Across the United States as a whole, statistics have shown that most students who leave high school are underprepared for college (Brown, Hesketh, & Williams, 2003). ACT measures college readiness by comparing benchmark scores in four subjects: English, math, reading, and science. Scores on these college readiness benchmarks indicate the level of achievement required for students to be successful in college. Approximately one in three high school graduates who took the ACT tests are not prepared educationally for college courses in English, reading, math or science. Twenty-six percent (26%) of high school graduates who took the ACT in 2013 met college readiness benchmarks in all of subject areas; 27% were successful in two or three; 16% met one (ACT, 2015). Mississippi is one of five states that less than one-third of students met three or four college readiness benchmarks (ACT, 2015). Suggestions for methods that schools can implement that would improve these results include standards-based instruction that allows for demonstrated understanding and mastery of the skills students are the expected learn, curriculum alignment, as well as insuring that instructors are qualified in the areas of instruction. (ACT, 2006b)

The study is significant in that it is beneficial in raising awareness of the advantages or disadvantages of utilizing ACT WorkKeys in the rural community college as an indicator of academic success as opposed to work readiness. This study is significant and useful to educational institutions because in the past, there have been few research studies that examine ACT WorkKeys as a predictor of academic success in rural community college students. As a result, rural community colleges and employers can

use the results of this study to better determine student career readiness upon completion of a rural community college career technical program, address student weaknesses and identify gaps in the curriculum as well as allow for an interchange enlightening key stakeholders about developing a skilled workforce.

## CHAPTER II

### REVIEW OF LITERATURE

Created in the 1980s by ACT, the ACT WorkKeys assessment is used to provide an evaluation link between business/industry and the classroom (Belton, 2000). Its purpose is to link education and business for the development and improvement of employability and performance skills in the workforce. Over the years, secondary and post-secondary career technical centers have implemented ACT WorkKeys as a tool to gauge skill levels and education necessary for employment. ACT WorkKeys provides a common language for students, educators, individual workers, business, industry and those involved in job training to discuss essential foundation workplace skills. These skills include the following: Applied Mathematics, Applied Technology, Listening, Locating Information, Observation, Reading for Information, Teamwork, and Writing. ACT WorkKeys also identifies any gaps between student skills and employment needs. Finally, ACT WorkKeys can be used to analyze how adequate training program's mastery of employer needs.

The purpose of this study was to examine ACT WorkKeys as an indicator of academic success. This chapter will review related literature of factors that can indicate that there is a direct relationship between ACT WorkKeys and student success. The history of the rural community college system, as well as the history of career technical

programs, will also be investigated. Developmental classes, program completion, and job placement will all be explored.

### **Human Capital**

Human capital has been defined as those abilities and familiarities that are attained as a result of education, training, and experience (Organisation for Economic Co-Operation and Development, 2001). Human capital necessitates the essential skills that improve individual productivity as well as increases their income potential because of the skills that these individuals possess. Qualities such as these are the outcome of scholarly investments in education and training (Becker, 1993). The U.S. economy has transformed from a manufacturing capital to one that is more service driven. This shift has turned attention to human capital development within societies in order that competitiveness might continue to exist within the new global economy.

The view of human capital is an expansion of monetary wealth and denotes one's skills and knowledge (Becker, 1993). Like other forms of wealth, human capital is predicted to produce upcoming incentives that are expected to come in the form of occupational opportunities, increased income, and an increase as it relates to the production of commodities. When compared to non-human capital, human capital differs because people cannot be disconnected from their knowledge, skills, and other characteristics that they possess (Becker, 1993).

Disparities in educational achievement has been addressed as one of the primary sources of the increase in income disproportion. Deficient skills are primarily associated with economic and social imbalances. According to Machin and Vignoles (2004), measures that involve formal education, on-the-job and vendor training have been

developed as a process to increase human capital. Human capital theory suggests that “individuals and society derive economic benefits from investments in people” (Sweetland, 1996, p. 341).

### **History of Community Colleges**

The history of the community college dates back to 1901, with the inception of Joliet Junior College. This great movement afforded the opportunity for a group of high school students to take college level courses, with the opportunity to later transfer to the University of Chicago (Vaughan, 2006). Because of the great success of this idea, by 1930, 440 junior colleges had been founded in all states, except five. During this Depression period, community colleges initiated job-training programs geared at assisting with the widespread unemployment problem. After World War II, new jobs were created. However, these jobs required a different level of skills than those possessed by individuals who were returning from military service. This economic conversion, along with the GI Bill substantial financial assistance program permitted an unprecedented quantity of veterans to attend postsecondary institutions, established the initiative for additional higher education options (Cohen & Brawer, 2003).

The community college’s role has increased from an extension of high school vocational training and junior colleges during the middle part of the century to becoming regionally accredited institutions offering the first two years of a bachelor’s degree, increasing numbers of paraprofessional programs, and offering fewer vocational programs in the last half of the 20th Century; Kasper claims the rural community colleges have grown immensely in number and have changed over time, due to the ever-changing curriculum (Kasper, 2002-2003). Community colleges play a critical role in the economic

health of its communities by ensuring that workers have the skills industries need to remain competitive in the global economy (Cohen & Brawer, 2003). The primary mission of the rural community college is to offer admission to courses and services that will provide what is needed for societies to function (Cohen & Brawer, 2003).

Rural community colleges has a history of prominence when it comes to concerns with workforce development and training (Peddle, 2000). Colleges, formally called junior colleges, are the channel that affords area residents with the opportunity to receive a higher education. This education comes in the form of academic coursework that yields an associate degree or certificate. Educational opportunities offered by the rural community college are offered at a fragment of the cost of traditional four year colleges and universities. In recent years, community colleges have experienced great growth in enrollment. In many rural areas across the country community colleges are the institutions principally responsible for providing access to post-secondary educational opportunities (Hardy & Katsinas, 2007). With this enrollment increase, community college's academic output is being viewed with more attentiveness. These institutions are under great scrutiny because of low retention and graduation rates.

Scholarly preparation is still the main purpose of community colleges. However, today the mission is more comprehensive due to the steady move toward career technical, workforce training, and community development partnerships (Kasper, 2002-2003). Rural community colleges have always taken a front-line status when it comes to issues with workforce development and training (Peddle, 2000). Upon the completion of studies at the community college, students are able to transfer to a 4-year institution to further

their studies, or they are able to enter the workforce with the associate's degree or certificate of training.

### **History of Community Colleges in Mississippi**

In the 1960s, the number of community colleges and enrollment rose to new levels, due to the number of baby boomers who were college-aged students. New community colleges were built and student enrollment went from 1-million students in 1965 to roughly 2.2 million by 1970. By 1980, community colleges had enrollments that reached upwards of 4.3 million students (Kasper, 2002-2003). At present, there are over 20 million students enrolled in college with 11 million people enrolled at the 4-year university level, and over 9 million people enrolled in 2-year colleges (U.S. Department of Education, 2012). Community colleges enroll 42 % of all postsecondary students (Bailey, et al., 2004).

Community colleges in Mississippi has a history that dates back to the early twenty-first century for providing Mississippians with access to basic educational pathways. These tracks include, but are not limited to, Adult Basic Education/General Equivalency Diploma preparation classes, personal enrichment, workforce education and development, and academic university transfer courses.

Mississippi towns were mostly agricultural rural areas whose inhabitants experienced less educational opportunities. Even though there were some towns who offered adequate education offerings, it was usually impossible for people who lived in rural areas to take advantage of these offerings due to limited transportation avenues. A 1908 legislation was passed that allowed rural residents access to better educational opportunities. This law initiated the establishment of the agriculture high school. An

excess of fifty agricultural high schools were started because of this law. In 1916, new legislation was conceded that permitted the consolidation of two or more schools in rural areas. This consolidation would in return allow for a better education system. Due to improved infrastructure in rural areas, and an increase in transportation means for those individuals who were once limited, more individuals were able to enroll in these consolidated schools. As a result, Mississippi's agriculture high schools experienced a decline in enrollment (Young & Ewing, 1978).

A solution to enrollment decline, state leaders proposed to allow qualified agricultural high schools to offer college courses along with their traditional classes. These qualified high schools were required to be geographically positioned at a minimum of twenty miles from 4-year colleges in order to prevent competition. Pearl River County Agricultural High School and Hinds County Agricultural High School were the first qualified schools to integrate college courses. As a result of this dual offering, enrollment increased and students were given access to college, an opportunity that would have been impossible without this move. At the forefront of this movement was Dr. Julius Christian Zeller, a Senator representing Yazoo County, who introduced Senate Bill No. 251, a law calling for the establishment of junior colleges that were responsible for providing access to affordable, quality education for Mississippi residents (Young & Ewing, 1978).

Between 1925-1929 Holmes County Agricultural High School, Harrison-Stone Agricultural High School, Sunflower County Agricultural High School, Kemper County Agricultural High School, Jones County Agricultural High School, Tate County Agricultural High School, Copiah-Lincoln, and Pike County began to offer college level

courses within their schools. Because of their early inclusion of these course, they are known as the “original” junior colleges. The junior college idea took off fast. Approximately 20 additional agricultural high schools were pursuing junior college status. With the perceptible threat of having an excess of junior colleges, Knox Broom, Mississippi’s supervisor of agricultural high schools and junior colleges, lobbied for regulation that would cap the number of junior colleges in the state. During the 1928 legislature session, Senator Zeller proposed Senate Bill No. 131. This bill would established a commission to regulate this developing group of institutions. The governing body was known as the Commission of Junior Colleges. The state was divided into 13 junior college districts with the allowance of one junior college per district. Mississippi established the United States’ first state system of junior colleges (Young & Ewing, 1978).

Because of the expanded role that junior colleges play in local communities, the label junior college no longer fit. Therefore, in 1987 Mississippi junior colleges, with the exception of one, changed their name to community college. Today there are 14 community and one junior college located in Mississippi (Young & Ewing, 1978).

### **Community College Student Retention**

According to Schuetz, within the first term or year of attendance, nearly 50% of the rural community college students who express intentions of earning a certificate, associate’s degree, or transferring to earn a bachelor’s degree do not complete the necessary requirements for achieving their educational goals (Hoachlander, Sikora, & Horn, 2003). Having a method in place that would to detect those students at risk would be extremely beneficial for institutions and the students they aid (Fike & Fike, 2008). A

study on the factors that influence rural community college online course completion revealed that issues such as setting aside for class, course design, technology, institutional issues, and preferred learning style are all factors that influence course completion (Aragon & Johnson, 2008). Modern methods are different from those of tradition, because of this academic and cocurricular activities are merging (Weaver, 2008). There has been insignificant change in student persistence and completion therefore efforts to improve this issue should be studied (National Center for Educational Statistics [NCES], 2005).

Social and academic adjustment of first year students plays a major role in their decision to continue their education. If there is not a balance among the two, one will suffer. Because of these issues, institutions have place much needed attention on providing support to help students cope while these issues. An association between student retention and student's connection with the institution has been determined (Tinto, 1994). Programs are being implemented at institutions to address these issues. Students are in the best position to learn while they are actively involved in their collegiate experience (Upcraft, 1995). The closer students feel to the institution and are actively involved in the campus life, the greater the chance they will stay (Austin, 1991)

Using Tinto's Student Integration Model as a guide in an effort to increase student retention, the University of Pittsburgh conducted a study that focused on the correlation of residence life and student retention. This population was chosen due to the fact that over 95% of the University of Pittsburgh first year students reside on campus. The school initiated its First-Year Experience (FYE) in the fall of 2007 when retention was 89% freshman to sophomore. Student Affairs implemented a program that consisted of

revised orientation that involved students coming to campus a week before classes to become familiar with their new homes, residence assistance contacting students via telephone and establishing social media methods of communication, issuing freshman class shirts and encouraging friendly competition as well as instituting a curriculum integrates academic and cocurricular activities. Previous research proved that there is significance in student involvement and having a sense of belonging to their program completion. Freshman to sophomore retention, at this university, increased to 91% in 2008 and 92.7% in 2009 (Brooks, 2010).

Scoggin and Styron (2006) conducted a study that consisted of surveying students who withdrew from college. At a community college located in south Mississippi, 1,196 participated in this voluntary survey process. The most common reason for student withdrawal was indicated as being personal reasons. The next highest indicated withdrawal reason were financial and employment. Reasoning as indicated by gender and race were examined also. It was established that there was no significant difference in withdrawal reasons for African American and White women and men as both mainly withdrew for personal reasons.

Fike and Fike (2008) studied predictors of retention in community college. Findings highlight the connection of developmental education programs and internet-based courses on student persistence. The study concluded that the top factors for predicting retention for a second year were utilizing student support services, receiving financial aid, taking Internet courses, and number of credit hours (Fike & Fike, 2008). Although only a small number of participants used student support services, of those who did, they felt more encouraged to continue on with their education.

This quantitative study explored predictors of enrollment semester hours registered and withdrawn in the first semester and parental educational level. The regression model in this study showed that passing a developmental reading course is the strongest predicting factor for retention. Individual's not taking developmental reading and having initially maintained a satisfactory score in a given placement test therefore indicated necessary skills for course readiness. Therefore previous findings were confirmed that reading skills have an impact on student success (Fike & Fike, 2008).

### **History of Career Technical programs in Community Colleges**

Recent studies indicate that enrolling in a four-year university may not be the best choice for some students (Cohen & Besharov, 2002; Gray, Wang, & Malizia 1995; Rosenbaum & Jones, 2000). Additionally, academic and university transfer curriculum does not offer a terminal degree in two years. As a result, career technical education is an educational pathway that offers terminal certificates and degrees and prepare students to enter the workforce immediately after graduation from a rural community college.

Cohen and Besharov (2002) stated that by “providing linkages to employers and a tryout period for new high school graduates, career technical education can enhance the chances for finding good jobs that lead to rewarding careers” (Cohen & Besharov, 2002, p. 15).

Career technical education, previously known as vocational education or “vo-tech”, began in the late 1800s in the United States. These programs are responsible for qualifying workers with the skills needed to be productive within the workforce. Under-skilled job hunters “are being turned away at the factory door and increasingly becoming the long-term unemployed,” according to The New York Times (Rich, 2010, par. 11).

Career technical education curriculums are introduced in middle school, and progresses

through community and technical college level. Career technical programs are accommodating and amenable to workforce needs. Partnerships are established with industry and businesses to offer, and ensure career readiness of skilled employees. These courses incorporate instruction and workforce training through a rigorous, applicable set of courses, hands-on training and practical knowledge. Some of these area of study include agriculture, trade and industrial, business and marketing, family and consumer sciences, health occupations, public safety and security, and technology (Association of Career Technical Education, n.d). According to Bartholome (1997), "During the rapid growth of business education in the 20th century education, local school boards in various states in the United States emphasized the preparation for work" (p. 12). Preparing students to master the required skill-set for these 20<sup>th</sup> Century jobs mandates a multifarious high school education. Sarkees-Wircenski and Scott (2004) put it in plain words, "...career technical courses make the difference between living in poverty or entering the middle class" (p. 5).

Congressional funding of vocational education began in 1862 with the passage of the Morrill Act, also known as the "Land Grant Act," this legislation gave states land that could be traded or rented to raise revenue to form at least one college for the purpose of offering a mixture of liberal and practical education (Paulter, 1999). The Carl D. Perkins Vocational Act of 1984, a national funding source for these programs, is a very prevalent piece of legislation in vocational education history. Its primary goal is to "assist states to expand, improve, modernize, and develop quality vocational education programs" (Paulter, 1999, p. 40).

## **Bandura's Social Cognitive Theory and Self-efficacy**

The social cognitive theory was developed in 1977 from the work of Bandura and was originally developed with the purpose of explaining social behaviors. Its core observation is that learning happens in a social setting where knowledge learned is obtained while observing. This theory has been applied to a wide spectrum of areas of study such as human functioning as career choice, athletics, organizational behavior, and mental and physical health. It has also been used in the areas of behavior in the classroom including motivation, learning, and achievement.

The social cognitive theory has five major concepts. The first concept is observational learning. This idea is also known as vicarious modeling because learning is a result of observing behaviors in the environment. Based on this theory, observational learning consist of attention, retention, production, and motivation (Anderman & Anderman, 2009). Attention is imperative to this concept because students must first observe a behavior in order to learn it. Retention is needed in order to convert what is observed into something that can be used for later. Production is required in order for students to recollect conclusions and execute what they have learned, and motivation is necessary for students to partake in any of these processes.

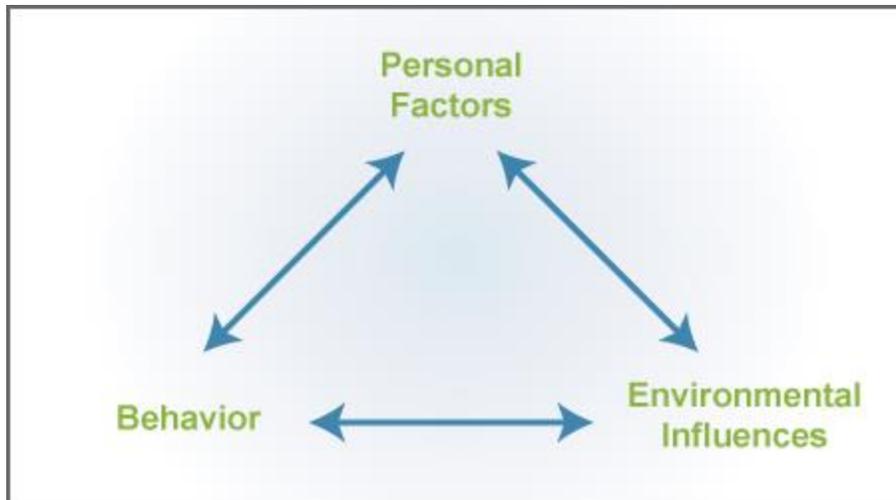
The second major concept is outcome expectations. Individual beliefs reflect what penalties are most likely to ensue behavioral performed (Anderman & Anderman, 2009). These beliefs are important with regard to the social cognitive theory because they help differentiate the decisions people make about what actions to take and not to take, based on past experiences, as well as the observations of others. How often a behavior occurs depends on whether the outcomes expected are positive or negative.

The third major concept is perceived self-efficacy. Self-efficacy refers to an individual's beliefs about whether they can accomplish a certain level of success at a particular task or not. It is viewed as a product of individuals' past performances, and current physiological state. Interventions that are designed to increase self-efficacy in school-aged children have proven to be effective (Anderman & Anderman, 2009).

The fourth major concept is goal setting. This reflects one's inner expectations for anticipated, desired, or preferred outcomes (Anderman & Anderman, 2009). Goals reflect the idea within the social cognitive theory that "people not only learn, they use forethought to envision the future, identify desired outcomes, and generate plans of action" (Anderman & Anderman, 2009, p. 834).

The fifth and final major concept is self-regulation. Social cognitive theory views self-regulation as the "students' ability to monitor or keep track of their own behaviors and outcomes" (Anderman & Anderman, 2009, p. 835). It occurs most often when students' respond to evaluations they have made about their own behavior. Like the other concepts, self-regulation goes hand in hand with the other processes within the social cognitive theory (Anderman & Anderman, 2009).

Figure 1 depicts the cognitive formulation of social learning theory that has been best articulated by Bandura and explains human behavior in terms of a three-way, dynamic, reciprocal model in which personal factors, environmental influences, and behavior continually interact. Bandura ascertains that actions often form one's behavior. Emphasis is placed on observational learning by implying that human activity is a function of performance, as well as the environment.



*Figure 1.* Bandura's Social Cognitive Theory.

## **Previous Research**

According to research conducted by Hendrick (2006), ACT WorkKeys is a moderately new instrument and there has been limited research conducted using it with adult populations. Recent studies, including American College Testing Work Keys assessments and individual variables of one-year technical completers in a selected community college in Mississippi (Belton, 2000); A comparative study of the Tests of Adult Basic Education (TABE) and WorkKeys with an incarcerated population (Buchanan, 2000). Applied Mathematics and Reading for Information Scores on ACT WorkKeys Assessment: Comparing groups by race, gender, and educational level (Barnes, 2002); and Evaluating WorkKeys Profiling as a pre-employment assessment tool to increase employee retention (Hendrick, 2006) have provided some thought-provoking theories and research using the ACT WorkKeys Assessments. The purpose of Hendrick's (2006) study was to investigate any effect on employee retention by using the ACT WorkKeys set of assessment tests. Quantitative analysis of candidate's test scores and qualitative analysis of interviews with 12 companies using the assessment for pre-employment testing were accomplished. Findings of the study indicated companies using ACT WorkKeys were generally satisfied with the quality of employees after testing. Additionally, the research indicated that the retention rate of new employees increased after the companies began using ACT WorkKeys.

Barnes' (2002) research revealed statistically significant differences in groups by race, gender, and educational level for two ACT WorkKeys assessments: Applied Mathematics and Reading for Information. The sample population included over 3000 high school students, technical, and two-year college students, and employees of

industry. Barnes' (2002) research found that Caucasian participants scored higher than African-American participants for both Applied Mathematics and Reading for Information. Barnes' (2002) research indicated that there was no statistically significant differences in the test results of males and females.

In 2000, Belton compared the ACT WorkKeys scores of one-year technical school completers with 2-year completers and compared the data for differences between the two sets of students. The data compared relationships of ACT WorkKeys scores with the variables of age, gender, hours worked per week, and request for employment information and were reviewed to determine differences of ACT WorkKeys scores and length of educational training. Belton's study concluded that 2-year completers scored higher on the ACT WorkKeys assessments than the 1-year completers.

Another study involved the comparison of TABE scores and ACT WorkKeys scores for the three assessments: Applied Mathematics, Locating Information, and Reading for Information. The sample consisted of imprisoned individuals and analysis involved the variables age, as well as employment status preceding the incarceration (Buchanan, 2000). The TABE is most commonly used by Adult Basic Education (ABE) programs. The TABE assessment has been useful in determining strengths and weaknesses of test takers for both reading and math. The ACT WorkKeys scaling system is much less precise; therefore, comparing the scores of both assessments would provide educators with useful data and statistics while assisting test takers in overcoming skill gaps.

## **College Placement Exams Effectiveness**

Standardized testing has been the standard method of evaluating ones academic ability and aptitude as well as interpreting college success. Bray and Belcher (1987), argues that assessment is an effective instrument used in shaping the directions for which higher education is improving. It is estimated that a large number of rural community college students, in excess of half, will be required to take at least one remedial course. (Bailey, Jeong, & Cho, 2010). Disturbingly, a low graduation rate exists for first-year community college students who are placed into non-credit bearing developmental classes. This alarm has prompted an investigative look at policies and procedures that have traditionally been acknowledged as the core measures of an effective developmental education program.

The practice of placement exams is a widespread practice in rural community colleges; over 92% of rural community colleges utilize this method for placement into developmental education. Placement decisions have been established based on results from administering standardized exams. Two exams, prominent in assisting with these placement decisions include Accuplacer and Computer-Adaptive Placement Assessment and Support System (COMPASS) (Parsad, Lewis, & Greene, 2003). Roueche, Baker, and Roueche (1984), argues that required assessment and placement contributes greatly to student success; institutions are more willing to use standardized test than student grade point averages as indicators of student ability or performance. A majority of rural community college students' test scores require that they are placed into developmental courses. Utilizing standardized tests assist with measuring student potential of being successful.

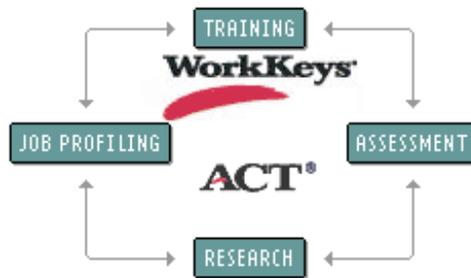
Variation does exist in college's policy for placement in all states and institutions (Collins, 2009). Data from an investigative study that sampled 116 institutions evaluated the characteristic components of developmental programs directed by the National Center for Developmental Education, between 1989 and 1992. The sample was composed 28% community colleges, 10% technical colleges, 33% private 4-year colleges and universities, 21% public 4-year universities and 9% research universities (Boylan, Bliss & Bonham, 1997). Findings were that 35% of the 2-year institutions required assignment into developmental courses based upon placement testing results; 69% of 4-year institutions had guidelines for their students in place as well. The researchers suggested that the absence of required placement into developmental courses at the 2-year colleges was a disadvantage because of the correlation of remediation and student success (Boylan et al., 1997).

### **Overview of ACT WorkKeys**

The ACT WorkKeys Assessment System, is an all-encompassing method for determining, communicating and refining the skills necessary for success in the workplace. Both individual ability and actual job requirements are assessed. When properly used a compatible match is formed between the basic skills required to be successful in a given position or career and individuals who possess those skills. Nationwide, all 50 states are currently using the ACT WorkKeys Assessment

ACT WorkKeys provides assessment in ten areas: Reading for Information, Applied Mathematics, Locating Information, Applied Technology, Business Writing, Writing Observation, Teamwork, Listening, and the newest, Listening for Understanding. Depending on the assessment, level scores range from 3 to 6 or 3 to 7.

As listed on the Center for Energy Workforce Development's website, there are four components of ACT WorkKeys: job profiling, assessment, training and research (Center for Energy Workforce Development, n. d.).



*Figure 2.* Major components of the ACT WorkKeys system.

According to Figure 2, there are four ACT WorkKeys. They are as follows.

- Job Profiling - Determining the basic skills required for individual jobs and occupational careers
- Assessment - Measuring the basic skills that individuals can apply to workplace situations
- Training - Curriculum guidelines from ACT and curriculum from ACT Level 1 publishers designed to improve an individual's skills so that they can be successful in jobs of their choice
- Research - ACT's extensive research and validation efforts results in a tool that can be applied with the highest levels of reliability and confidence to a wide range of education, employment and workforce development objectives (Center for Energy Workforce Development, n.d.).

ACT WorkKeys most often is utilized by industry, rural community colleges, economic developers, and those that teach adults (ACT, 2004; Hendrick, 2006). ACT WorkKeys assessments measure an individual's skill levels for critical workplace skill sets. These entities utilize the information gathered from testing for needs that are specific for their use. For example, industry administer ACT WorkKeys as a pre-employment tool. Community colleges usage aid in pre and post tests for programs of study to verify student knowledge and readiness for entry into the workforce. Economic developers find this tool a sufficient mechanism to validate skill levels of its pool of qualified laborers in order to entice new industry into the area. Adult educators can use ACT WorkKeys assessments to identify skill gaps in their students and prepare them for higher paying jobs

### **National Career Readiness Certificate**

The ACT NCRC has been acknowledged as the most successful approach in the mission of verifying workplace skills and predicting employment success. This credential certifies essential skills needed for workplace success by testing three foundational skills: Applied Mathematics, Locating Information, and Reading for Information. There are four levels at which the certificates are awarded. Examinees minimum level score should be three in each of the three areas in order to receive a NCRC. Based on the level scored, and employer is able to predict individual job readiness. The following are factors for level determinant (ACT, 2014).

- Bronze - scores at least a level three in each of the three core areas and has the necessary foundational skills for thirty-five percent of the jobs in the ACT WorkKeys database

- Silver - scores at least a level four in each of the three core areas and has the necessary foundational skills for sixty-five percent of the jobs in the ACT WorkKeys database
- Gold - scores at least a level five in each of the three core areas and has the necessary foundational skills for ninety percent of the jobs in the ACT WorkKeys database
- Platinum - scores at least a level six in each of the three core areas and has the necessary foundational skills for ninety-five percent of the jobs in the ACT WorkKeys database (ACT, n. d. b.).

### **Significance of Developmental Classes in the Rural Community College**

“There is a growing view that students who enroll in developmental courses are less successful in completing their programs than non-developmental students” (Noble & Sawyer, 2013, p. ii). More frequently students are placed into remediation courses in math than English (Bailey et al., 2010).

As reported by the National Center for Education Statistics (NCES), virtually all community colleges and several universities offer developmental education courses in order to preparing students who are in danger of not complete a higher education program due to subject area deficiencies (Parsad et al. 2003).

The probability of taking developmental courses is directly correlated to the sub scores students achieve on their ACT score. For example students who scored a 19 on the mathematics section of the ACT had a 0.29% chance of taking developmental math coursework, in contrast to a student who scored 15 on the mathematics section.

Data demonstrating the expected number of developmental class that a student took, based on their ACT sub score show that over ninety percent of the participants observed only took an English developmental class one time before being prepared to take regular college English course work. These data prove that developmental courses in rural community colleges are beneficial to students who need remedial course work.

In a recent study conducted by ACT, 118,000 students' ACT test scores were examined and compared to college outcomes data. The data concluded that students with lower ACT sub scores who took developmental courses had a higher likelihood of completing their Bachelor's degree than students with similar ACT scores who did not take developmental courses (Noble & Sawyer, 2013).

### **Summary**

The review of literature provided data that support ACT WorkKeys, rural community colleges and career technical role in qualifying and quantifying individuals for today's workforce. Career readiness is an essential asset for today's job seeker. Utilization of ACT WorkKeys affords an individual the opportunity to earn a creditable credential that signifies one's preparedness in skill mastery, academic competency and workforce readiness. Rural community college career technical programs provide the foundation necessary for learning these skills.

With the changes that are occurring in the demand for a skilled workforce, our present economy is currently experiencing a population that is lacking in the readiness to fulfil the needs that now exist due to a transformation from a workforce that was once manufacturing to one that requires a higher-skill base (Bolin, 2005). SCANS was established to define the skills that were required by business and industries, in order for

individuals to be classified as work ready (SCANS, 2000). Rural community colleges aid in supplying significant economic development resources for local communities. This is beneficial in rural areas where shortages of educated populations exists (Young, 1997). The challenge of career technical education in Mississippi's rural community colleges is to resuscitate the American dream of personal economic autonomy and success for everyone who has a desire to learn more in order to be successful in their occupation.

## CHAPTER III

### METHODS

Chapter three explains the methods that were performed to examine existing data for students in a Mississippi rural community college who were seeking a career technical degree. This study answered three research questions to conclude whether significant differences in course placement in math and English, program of study completion, and job placement exist based on National Career Readiness Levels. Included in this chapter is a description of the research design, research questions, research site, population, instruments, data collection procedures, and data analysis techniques.

#### **Research Design**

This research study employed a causal-comparative quantitative research design. This study sought to identify what, if any, differences exists between scores on ACT WorkKeys and degree-seeking career technical students' success within a rural community college in Mississippi. Research involved examining historical data of a specified population and determining if differences existed among the variables of focus. Causal comparative research involves existing data where the independent variable has occurred and investigates differences centered on the dependent variable. Neither random assignment nor manipulation of an experimental variable occurs in this type of research (Schenker & Rumrill, 2004).

For this study, scores from ACT WorkKeys in the areas of Applied Mathematics, Locating Information, and Reading for Information were the predictor variables; math and English placement, program of study completion, and job placement served as the criterion variables. The predictor variables are based on the Social Cognitive Theory and previous research findings in the literature. These variables are grouped according to: (a) students enrolled in developmental courses; (b) degree-seeking students; and (c) job placement for students who become employed after program completion.

### **Research Questions**

The following research questions guided the research design:

1. Are there differences in academic placement in math and English among students with different National Career Readiness levels?
2. Are there differences in rates of program completion among students with different National Career Readiness levels?
3. Are there differences in the number of job placements among students with different National Career Readiness levels?

### **Research Site**

Participants were selected from a rural community college in Mississippi. This college enrolls 2,600 students and is located in a community of 1,900 residents. The rural community college offers both transfer and career technical coursework. Approximately 500 students are enrolled in the 15 career technical programs at this rural community college.

## **Participants**

The population of this study consists of students enrolled at a rural Mississippi community college who are identified as career technical students 18 years of age and older, seeking a certificate, diploma, or two-year career technical degree during the fall 2009 – spring 2012 school terms. The participants in the study have completed the three ACT WorkKeys assessments: Applied Mathematics, Locating Information, Reading for Information, and two COMPASS/ACT assessments: math and English; students will also have had sufficient time to complete their programs of study and search for a job. All students who meet the criteria will be included in the study; no sampling will occur.

## **Instrumentation**

### **Background**

Existing data will be utilized from the ACT WorkKeys assessment scores to include: Applied Mathematics, Locating Information, and Reading for Information. This skill-set combination has been reliably acknowledged as vital for attainment in a wide series of occupations, making them crucial foundational skills. “Developed with input from employers, labor organizations, educators, and policymakers, ACT WorkKeys assessments are criterion-referenced tests anchored to the skills needed for workforce readiness” (ACT, 2006a, p. 3).

The scores on each assessment were reviewed: score levels 3–7 for reading for information, score levels 3–7 in applied mathematics, and score levels 3–6 in locating information. In addition, COMPASS and or ACT score in math and English were used for this study. The standard measure of 1 = bronze, 2 = silver and 3 = gold was used for each student in regard to National Career Readiness Level attainment. Course math and

English placement, program of study completion, and job placement was recorded and then coded in ordinal format, as yes = 1, no = 2, and no contact = 3.

ACT WorkKeys assessments administered spring 2009 thru fall 2012 were considered as the study was focused on existing data from this period. The scores of this group of students were the results of ACT WorkKeys online computerized assessments in Reading for Information, Applied Mathematics, Locating for Information.

Scores for each of these three ACT WorkKeys assessments are independent of each other. Aggregate scores are defined in “levels,” that range from the lowest score of 3 to the highest score of 7 for Applied Mathematics and Reading for Information, and from the lowest score of 3 to the highest score of 6 for Locating Information. Overall assessment scores are determined based on a certain number of correctly answered questions, interpreted by its five level scale of difficulty. Level 3 is the least complex and Level 7 is the most complex (ACT, 2012b).

### **Validity and Reliability**

Validity is associated with a three-part model consisting of: content validity, construct validity, and criterion-related validity (Brown, 1996). The reliability of an assessment is “how dependably or consistently a test measures a characteristic” (U.S. Department of Labor, 2000, p. 3-2). Evidence of validity in the ACT WorkKeys system is the authenticity of job profiling for each occupation that allocates a mastery skill level for each assessment preceding the assessment process. The job-analysis method consists of working with a panel of Subject Matter Experts (SMEs) to characterize all of the requirements that are necessary for successful job performance. This profiling procedure

serves as sufficient evidence required to support criterion-related and content validity (ACT, 2001).

Since 2001, ACT has completed reliability and validity analyses using ACT WorkKeys assessments, particularly Applied Mathematics and Reading for Information (Hendrick, 2006).

ACT has evaluated ACT WorkKeys test scores in three categories that reflect test reliability: internal consistency, generalizability, and classification consistency (ACT, 2005). ACT reports an internal consistency +0.92 reliability coefficient for two forms of Reading for Information and Applied Mathematics as tested in 2002 and 2003. These values are considered high for the 30-item test administered and reflect good internal consistency (ACT, 2005, As cited in Hendrick, 2006, p. 66).

COMPASS was launched in 1992 as a computer-delivered assessment. The purpose of this assessment was to offer a faster approach to assist institutions in measuring student skill levels that aids in student placement into courses (ACT, 2009). The COMPASS evaluates students' skill levels in writing, reading, and mathematics. A formal report is supplied to the students that details suggestions in relation to which courses that the students should enroll in order to be successful (ACT, 2007).

The validity of the COMPASS is centered on its capability to place students successfully in the correct level of course and measure corrective tutoring for adjusted placement. The ACT offers a predictive validity system to determine a student's predicted likelihood of success in a standard-level course (ACT, 1997).

## **Data Collection**

Before the start of this study, the researcher requested the approval of the rural community college being studied and the Mississippi State University's Institutional Review Board (IRB) for the Protection of Human Subjects to conduct the research. All forms and approvals were completed and returned before collecting data. Once permission was granted by the IRB, ACT WorkKeys assessment scores in Applied Mathematics, Locating Information, and Reading for Information, along with COMPASS scores in math and English, whether or not program completion was obtained, and employment status were collected for each of the students from the Institutional Research Office of the rural community college being studied. Job placement data were obtained via the Perkins' report provided by the Director of Workforce Education at the rural community college. Data were collected from three ACT WorkKeys subject areas: Applied Mathematics, Locating Information, and Reading for Information. ACT's Career Readiness Certificate is issued based on the combination of these assessment results. The data were inputted in Statistical Package for Social Sciences (SPSS) for Windows 20.0.

## **Data Analysis**

Data were entered into the SPSS for Windows 20.0 computer software program to determine if differences existed between ACT WorkKeys scores and measures of student success. The statistical measure to be used to investigate research questions 1-3 is Pearson's Chi-Square test. This type of testing is used most often to determine significance of differences of a specified population (Preacher, 2001). A chi-square analysis concludes if your observed rates are sufficiently different from the predicted

occurrences to say that the two variables are correlated. Chi-square testing serves to verify if in fact meaningful variances among populations being tested exist (Gravetter & Wallnau, 2009).

Existing data on Career Technical Education students at a rural community college in Mississippi were obtained and examined to determine if a differences existed between National Career Readiness Level attainment and student success. Data were collected and analyzed, and frequency and percentage tables were generated using the SPSS for Windows 20.0.

In this study the National Career Readiness Level that the community college students attained was used to examine if differences existed between their attainment level, and their placement in regular math and English courses, program of study completion, and job placement.

A causal-comparative non-experimental quantitative research design was used for this study. Existing data on 135 career technical education students were obtained. Variables measured included National Career Readiness level attainment from three sections (Reading for Information, Applied Mathematics, and Locating for Information) of the ACT WorkKeys assessment. Data did not reveal the identity of the student but included in this information attributes that revealed students' demographic qualities (race/gender), student's placement into math and English course, if the student graduated, and employment attainment.

Pearson's Chi-Square was used to compare the nominal variables, National Career Readiness Level Attainment, course placement, program of study completion, and job placement. The data provided by this procedure allow for the examination the

occurrences of the focus of study and explain if an association exists amongst two variables. This analytical method is used most to measure if a significant difference between the outcome of categorical variables that are exclusive, independent, and exhaustive (Rojewski, 2001).

### **Summary**

This chapter detailed the analytical methodology utilized in order to conduct the research study. Participants for the study and procedures were identified as well as a description of measurement instrument; its validity and reliability were discussed. Procedures for data collection, and analysis were discussed to be used.

CHAPTER IV  
DATA ANALYSIS AND FINDINGS

**Introduction**

In this chapter information presented includes the data analysis and findings of the research study. The summary of the research study includes collected data, conclusions based on the findings of the study.

**Relationship of Research and Purpose**

The principal purpose of this research was to determine if a relationship existed between ACT WorkKeys as indicated by the combined level attainment in Applied Mathematics, Locating Information, and Reading for Information in rural community college students' placement in mathematics and English classes, program of study completion, and job placement. Based on this purpose, the following questions were answered:

1. Are there differences in academic placement in math and English among students with different National Career Readiness levels?
2. Are there differences in rates of program of study completion among students with different National Career Readiness levels?
3. Are there differences in the number of job placements among students with different National Career Readiness levels?

This chapter establishes a brief synopsis of the problem for this study, identifies the populations examined, and presents the results of the completed study. Results are presented for three research questions individually. The data collected will be presented along with a discussion of the statistical analysis.

### **Demographic Information**

In order to present the most accurate representation of the data, student demographic information was obtained from existing data of 135 students who were awarded a National Career Readiness Certification based on the collective scores that were attained on three ACT WorkKeys exams: Reading for Information, Applied Mathematics, and Locating for Information. The demographic makeup of participants reported in this study included 87 males and 48 females. The racial make-up of this population included: 54 African Americans: 24 Females, 20 Males; 72 Caucasian: 19 Female, 53 Male; 8 American Indian: 5 Female, 3 Male; and 1 Hispanic: 0 Female, 1 Male. Each of these students was enrolled in a career technical education program at the rural community college in the state of Mississippi. Table 1 presents the number of students who were involved in the study, gender, and ethnicity have been included as well. Data supplied for Table 1 provide an enhanced understanding of the make-up of the population included in the study.

Table 1

*Frequencies and Percentages of Demographic Variables*

Variable	Frequency	Percentage
<b>Race</b>		
African American	54	40.00
Caucasian	72	53.33
American Indian	8	5.93
Hispanic	1	0.74
<b>Gender</b>		
Female	48	36.00
Male	87	64.00
<b>Gender/Race</b>		
African American/Female	24	18.00
African American/Male	30	22.00
Caucasian/Female	19	14.00
Caucasian/Male	53	39.00
American Indian/Female	5	4.00
American Indian/Male	3	2.00
Hispanic/Female	0	0.00
Hispanic/Male	1	1.00

**Research Questions**

**Research Question One**

Are there differences in academic placement in math and English among students with different National Career Readiness levels?

Utilizing a Pearson’s Chi-Square to analyze the data including an N of 135, the gold level participants reported a higher level of placement rate in regular math courses, (Pearson  $\chi^2$  ( $N = 135$ ,  $df = 2$ ) = 27.55,  $p = .000$ ). To determine if a differences existed between National Career Readiness Level and math course placement, a chi-square analysis was conducted. As indicated by the results, there is a statistically significant

difference between National Career Readiness Level and course placement. The results demonstrated a statistically significant result ( $p < .01$ ) reflecting that students who scored at a level of bronze and silver were placed in remedial math and individuals who scored at the gold level went directly into the regular math course (see Table 2). High achieving students gold level awardees demonstrated a higher result of placement into the regular math classes.

Table 2

*Math Course Placement according to Career Readiness Level*

	Regular Math Placement				Total
	Yes		No		
	Frequency	Percentage	Frequency	Percentage	
Bronze	1	3.30	29	96.7	30
Silver	9	10.1	80	89.8	89
Gold	9	56.3	7	43.8	16

Utilizing a Pearson's Chi-Square to analyze the data including an N of 135, the silver and gold level participants reported a higher level of placement in the regular English courses, (Pearson  $\chi^2$  ( $N = 135$ ,  $df = 2$ ) = 17.29;  $p = .000$ ). The results demonstrated a statistically significant ( $p < .01$ ) result reflecting that students who scored at a level of bronze were placed in remedial math and individuals who scored at the silver and gold level went directly into the regular math course (see Table 3). High achieving students who attained the silver and gold level certification were placed into the regular English classes at a higher percentage and those entering developmental showed a strong significance to those students who scored at the bronze level certification.

Table 3

*English Course Placement According to Career Readiness Level*

	Regular English Placement				Total
	Yes		No		
	Frequency	Percentage	Frequency	Percentage	
Bronze	11	36.7	19	63.3	30
Silver	62	69.7	27	30.3	89
Gold	15	93.8	1	6.3	16

**Research Question Two**

Are there differences in rates of program completion among students with different National Career Readiness levels?

As described in Table 4, rates of program completion demonstrated no statistical significance. A statistically even number of graduates and non-graduates were represented in each level category (Pearson  $\chi^2$  ( $N = 135$ ,  $df = 2$ ) = 1.618,  $p = .445$ ).

Table 4

*Graduation Rate According to Career Readiness Level*

	Program Completion				Total
	Yes		No		
	Frequency	Percentage	Frequency	Percentage	
Bronze	12	40.0	18	60.0	30
Silver	45	50.6	44	49.4	89
Gold	6	37.5	10	62.5	16

### Research Question Three

Are there differences in the number of job placements among students with different National Career Readiness levels?

The number of job placements demonstrated no statistically significant results. However, the number of employed students is very high and the number of unemployed students is very low. There is also a large number of student's whose employment status was unknown (see Table 5). Relationship between level and employment is not statistically significant ( $p < .01$ ), (Pearson  $\chi^2$  ( $N = 135$ ,  $df = 4$ ) = 1.143,  $p = .887$ ).

Table 5

*Job Placement Rate According to Career Readiness Level*

	Employment Status						Total
	Yes		No		No Contact		
	Frequency	Percent	Frequency	Percent	Frequency	Percent	
Bronze	17	56.7	2	6.7	11	36.7	30
Silver	50	72.5	5	7.2	34	49.3	69
Gold	9	56.3	2	12.5	5	31.3	16

### Chapter Summary

In this chapter research questions were answered based on the results of the Pearson Chi Square and National Career Readiness Level attainment: the p-value results showed significant differences did exist between National Career Readiness Level and placement into reading and English courses. The p-value results observing National Career Readiness Level and program of study completion and job placement indicated no significance was proven.

CHAPTER V  
SUMMARY, CONCLUSIONS, AND RECOMMENDATIONS

**Introduction**

In this chapter an overview will be given as it relates to the study. Included will be a summary, a discussion of the findings, conclusions, and recommendations based on the study. Limitations will be addressed along with recommendations for further research.

**Summary of the Study**

ACT WorkKeys is a common employment assessment that business and industry are utilizing to assist with measuring workplace skills of current and potential employees. ACT WorkKeys primarily focus on the skills that employers have identified as being crucial to employment success. Included in these skills are two that are also necessary for academic success, reading and math. Because of the relatively new initiative to administer ACT WorkKeys as a national credentialing assessment more research is necessary to validate its ability to predict employability as well as academic readiness due to there not being many systems for converting academic readiness into a measurement of work readiness (California Department of Education, 2014). Career technical programs within the community college setting are in place to ensure that students are prepared for jobs that await them for employment immediately after

graduation. Therefore, more research is needed to validate these program's use for both education and the workplace. The combined level scoring of three ACT WorkKeys assessment: Applied Mathematics, Locating Information, and Reading for Information determines National Career Readiness Level attainment. This causal-comparative non-experimental study evaluated National Career Readiness Levels of 135 community college career technical education students who were enrolled during the fall 2009 thru spring 2012 at a rural community college in Mississippi. Assessed was the attained National Career Readiness of these students and their differences related to placement in math and English courses, program completion, and job placement. Community colleges in Mississippi undertake an important part in meeting the requirements of various career pathways. The skills needed for the unindustrialized job of today's workforce have transformed significantly from the industrial period. It has been proven that individuals who gain educational credentials beyond high school are significantly better off than those who do not (Robinson, 2002). Demand for skilled workforce has developed into a crucial need by business and industry (Friedman, 2005).

### **Summary of the Findings**

Three research questions were analyzed to discuss the findings that were presented in Chapter IV. The questions that guided this study were:

#### **Research Question 1**

Are there differences in academic placement in math and English among students with different National Career Readiness levels?

As indicated by the results of the findings of this research question, a statistically significant differences between National Career Readiness Level and course placement exist. The results were reflective to indicate that students who scored at a level of bronze and silver were placed in remedial math at a higher rate than individuals who scored at the gold level who were placed into the regular math course.

The results were also reflective to indicate that gold and silver level participants reported a higher level of placement in the regular English courses. High achieving students who attained the silver and gold level certification were placed into the regular English classes at a high percentage and those entering developmental English showed a strong significance to those students who scored at the bronze level certification.

## **Research Question 2**

Are there differences in rates of program completion among students with different National Career Readiness levels?

There was no statistical significance in National Career Readiness level attainment and graduation rate. Surprisingly, statistically there were a similar number of graduates and non-graduates in each level category. A review of literature by Aragon and Johnson (2008) highlighted some factors that encourage college program of study completion include utilizing student support services, and receiving financial aid (Fike & Fike, 2008).

A recent survey conducted revealed that students often fail to complete their college credential because they are overwhelmed, overextended, underfunded, and underprepared. Results of the survey indicated that some of the most frequent reason for not completing included: Not being able to balance work and school, not being

financially able to afford cost associated with school, and increase in cost associated with attending school. It was also noted that about 60% of community college students are classified as part-time, therefore there is a limit to the amount of financial aid benefits (Scoggin & Styron, 2006)

### **Research Question 3**

Are there differences in the number of job placements among students with different National Career Readiness levels?

There was not a significant difference in the number of job placement. A high percentage of individuals represented in each level are reported to being employed. The number of individuals whose employment status was not available is significant therefore, their employment status is unknown.

### **Limitations of the Study**

Because manipulation of the independent variable does not occur in a causal comparative study, there is a risk of internal validity occurring (Schenker & Rumrill, 2004). The following limitations to this study should be considered:

1. This study consisted of students who were enrolled in a career technical program.
2. This study consisted of participants of only one community college.
3. This study consisted of a sample size that was relative small.
4. This study consisted of students who were enrolled during the spring 2009 thru fall 2012 semesters.

## **Recommendations for Policy and Practice**

This current study can be utilized by the community college deans and administrators. Because the findings of this study found significant differences between placement into math and English courses, the information presented in this study will be valuable when looking at other methods of assessments for entrance into certain career technical programs.

A large number of students enter remedial classes upon their entrance into college programs. Of the remediation courses in the areas of math and English, remedial math has the highest percentage of placement (Bettinger & Long 2007); the results presented in this study align with this finding. The community college has the task of making sure that individuals are trained to meet current workforce needs; therefore, educational researchers must continue to conduct research that will prove to play a vital role in bridging work and academic deficit.

Further research exploring ACT WorkKeys scores and National Career Readiness Level certifications and those competences that are required for work as opposed to college readiness should be observed. This would allow community colleges with a resourceful tool to define if ACT WorkKeys could be employed as a gauge to assist with measuring student success. Findings reported in this study, in conjunction with previous ACT WorkKeys studies, provide the foundation for other community colleges to conduct more empirically based studies that focus on ACT WorkKeys and its relationships academic success.

## **Recommendations for Future Research**

Because of the role that the community college plays in training today's workforce, research was conducted to look at ACT WorkKeys as an indicator of success. The future research relating to college choice factors will continue to grow in importance due to the increased significance placed on a college education. Future studies observing the use of ACT WorkKeys will assist with the validity of assessments that will help early detection and placement of students who may require extra courting and assistance in order for them to be successful with their select program of study completion.

Recommendations for future studies include

1. Comparing ACT WorkKeys scale scores with ACT/COMPASS subject area scores.
2. Because there was no contact with the participants of this study, future studies are recommended that would include interviewing students who have taken ACT WorkKeys and find out how serious they were when taking the exam.
3. Other options would be to test those students who are enrolled in transfer/academic programs.
4. This study was conducted a rural community college. It is recommended to conduct this exact study at an urban community college.

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APPENDIX A  
CONSENT TO CONDUCT RESEARCH

Good afternoon, Ms. Williams!

The East Central Community College Executive Council unanimously approved your Request to Conduct Research at East Central Community College on May 6, 2015.

Upon review of your request this appears to involve a straightforward extraction of student completion data which will link relationally to a listing of Workkeys participants which you will supply. Let me know re: next steps forward.

Congratulations and I look forward to working with you on this research.

David M. Case  
Vice President for Institutional Research and Effectiveness  
East Central Community College  
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APPENDIX B  
IRB APPROVAL

**From:** <[nmorse@orc.msstate.edu](mailto:nmorse@orc.msstate.edu)>

**Date:** May 13, 2015 at 4:37:00 PM CDT

**To:** <[lkw9@msstate.edu](mailto:lkw9@msstate.edu)>

**Cc:** <[nmorse@orc.msstate.edu](mailto:nmorse@orc.msstate.edu)>, <[nmorse@orc.msstate.edu](mailto:nmorse@orc.msstate.edu)>, <[lte1@msstate.edu](mailto:lte1@msstate.edu)>

**Subject: Study 15-175: ACT WorkKeys as an indicator of academic success**

Protocol Title: ACT WorkKeys as an indicator of academic success

Protocol Number: 15-175

Principal Investigator: Ms. Lucretia Williams

Date of Determination: 5/13/2015

Qualifying Exempt Category: 45 CFR 46.101(b)(4)

Dear Ms. Williams:

The Human Research Protection Program has determined the above referenced project exempt from IRB review.

Please note the following:

- Retain a copy of this correspondence for your records.
- Only the MSU staff and students named on the application are approved as MSU investigators and/or key personnel for this study.
- The approved study will expire on 12/31/2015, which was the completion date indicated on your application. If additional time is needed, submit a continuation request. (SOP 01-07 Continuing Review of Approved Applications)

- Any modifications to the project must be reviewed and approved by the HRPP prior ! to implementation. Any failure to adhere to the approved protocol could result in suspension or termination of your project.
- Per university requirement, all research-related records (e.g. application materials, letters of support, signed consent forms, etc.) must be retained and available for audit for a period of at least 3 years after the research has ended.
- It is the responsibility of the investigator to promptly report events that may represent unanticipated problems involving risks to subjects or others.

This determination is issued under the Mississippi State University's OHRP Federal-wide Assurance #FWA00000203. All forms and procedures can be found on the HRPP website: [www.orc.msstate.edu](http://www.orc.msstate.edu).

Thank you for your cooperation and good luck to you in conducting this research project. If you have questions or concerns, please contact me at [nmorse@orc.msstate.edu](mailto:nmorse@orc.msstate.edu) or call 662-325-5220.

Finally, we would greatly appreciate your feedback on the HRPP approval process. Please take a few minutes to complete our survey at <https://www.surveymonkey.com/s/PPM2FBP>.

Sincerely,

Nicole Morse, CIP  
IRB Compliance Administrator

cc: Linda Coats, Advisor