January 2014

Impact Of Career And Technical Education On College And Career Readiness In Kentucky

Linda Smith Floyd
Eastern Kentucky University

IMPACT OF CAREER AND TECHNICAL EDUCATION ON

COLLEGE AND CAREER READINESS IN KENTUCKY

By
Linda Smith Floyd

Dissertation Approved:

Chair, Advisory Committee

Member, Advisory Committee

Member, Advisory Committee

Member, Advisory Committee

Dean, Graduate School

STATEMENT OF PERMISSION TO USE

In presenting this dissertation in partial fulfillment of the requirements for a Doctor of Education degree at Eastern Kentucky University, I agree that the Library shall make it available to borrowers under rules of the Library. Brief quotations from the dissertation are allowable without special permission, provided that accurate acknowledgement of the source is made.

Permission for extensive quotation from or reproduction of this dissertation may be granted by my major professor, or in his absence, by the Head of Interlibrary Services when, in the opinion of either, the proposed use of the material is for scholarly purposes. Any copying or use of the material in this dissertation for financial gain shall not be allowed without my written permission.

Signature Linda A. Floyd

Date December 9, 2014

IMPACT OF

CAREER AND TECHNICAL EDUCATION

ON COLLEGE AND CAREER READINESS

IN KENTUCKY

By

LINDA SMITH FLOYD

Rank I in Leadership
Eastern Kentucky University
Richmond, Kentucky
1997

Masters of Business Education
Eastern Kentucky University
Richmond, Kentucky
1989

Bachelor of Science
Business Administration and Office Administration
Computer Science Minor
Union College
Barbourville, Kentucky
1982

Submitted to the Faculty of the Graduate School of
Eastern Kentucky University
in partial fulfillment of the requirements
for the degree of
DOCTOR OF EDUCATION
December 2014

DEDICATION

This dissertation is dedicated to my family who has shown me continued love and support throughout this process. My husband Joe, daughter Lindsay, mother Billie Smith, Aunt Jean Archer, mother-in-law Jean Floyd, and father-in-law Larry Floyd, thank you for your encouragement and understanding as I focused a great deal of my energy and time towards this degree. I love you.

I am especially grateful to my husband Joe for your patience and continued support. I could not have completed this program without the encouragement, support and love that you always give.

To my precious daughter Lindsay and wonderful son-in-law Landon Jones, may you also be motivated and encouraged to continue in the pursuit of your dreams. I hope I have set an example and inspired you to continue to follow your aspirations and believe that with hard work, dedication, family support, and prayer, anything is possible.

I must thank my mother for her spunk, drive and determination which I also acquired. I would also like to acknowledge my late father, Willis "Snuffy" Smith for being such a great role model and for instilling the importance of hard work and education.

I would also like to thank other family members, too numerous to mention, for their continued support and understanding of the commitment and time required to achieve this final stage in my lifetime of devotion to education.

A very special thank you goes out to a great friend and coworker who helped me acquire the data necessary to complete this project.

An exclusive thank you goes out to my professor and chair, Dr. Charles Hausman; it was your continued push that has allowed me to be able to achieve this status. Without your guidance and wisdom, I could not have achieved this educational milestone in such a short period of time.

I would especially like to give thanks to God for giving me the strength and good health while undergoing such a challenging endeavor.

ACKNOWLEDGEMENTS

I would like to thank the members of my committee for their patience and support during the many months of work on this endeavor and the faculty of the Educational Leadership and Policy Studies program who provided challenging insights and instruction. I especially thank my committee chair, Dr. Charles Hausman for his time, expertise, patience, guidance, and special encouragement that he generously extended throughout the process. It was his countless hours of one-on-one meetings and emails that enabled me to be able to succeed and complete this monumental achievement. I would also like to thank the administrator that was so willing to share the data for the school used in this study. I am forever grateful to my husband, our daughter, Lindsay, my mother, Billie Smith, and other family members who have been so understanding and have encouraged me to complete this process. Without their support and understanding of the time and effort that one must commit to the completion of the endeavor, I would not have been able to have completed this process. Most importantly, I am thankful to God for giving me the intellectual ability, patience and endurance that has been required to get to this significant point. There were many prayers that he answered that enabled me to be able to complete this milestone in my life.

ABSTRACT

The study examined the college and career readiness (CCR) results of a persistently low achieving (PLA) high school located in rural Kentucky. The study included a quantitative analysis examining the statistical role of career and technical education (CTE) in the Kentucky accountability system for high schools. The study assessed student results on academic and technical assessments required by the state's accountability model for CCR as reported for the 2012 and 2013 school years. Frequencies and independent sample t-tests were utilized.

The absence of significant statistical differences between preparatory students, those completing two credits and enrolled in the third credit in a CTE pathway, and non-preparatory students can be viewed as a positive outcome, an educational victory. Preparatory students can be equal contributors to the high school's CCR accountability. A fraction of a point can keep a school from being labeled PLA (now referred to as priority schools). Therefore, it is critical for administrators to ensure every student receives an opportunity to become college and/or career ready.

The study also brings to light the increased emphasis and importance of career and technical education and the role it plays in helping high schools reach their college and career readiness goals. Kentucky's new model assigns the same point value to career readiness as it does college readiness making the stakes greater than ever before for CTE as it is solely responsible for the career readiness portion of CCR in the state.

TABLE OF CONTENTS

LIST OF TABLES

TABLE PAGE

LIST OF ABBREVIATIONS

Adequate Yearly Progress.....AYP

American College Testing .....ACT

American Vocational Association .....AVA

Annual Measurable Objective..... AMO

Area Technology Center.....ATC

Armed Services Vocational Aptitude Battery.....ASVAB

Career and Technical Education .....CTE

College and Career Readiness .....CCR

Computer Adaptive Placement Assessment and Support System .....COMPASS

Continuous District Improvement Plan ..... CDIP

Continuous School Improvement Plan .....CSIP

Council on Postsecondary Education..... CPE

Department for Workforce Investment.....DWI

Kentucky Department of Education..... KDE

Kentucky Employability Certificate .....KEC

Kentucky Occupational Skills Standards Assessment..... KOSSA

Kentucky Online Testing Program .....KYOTE

National Career Readiness Certificate .....NCRC

No Child Left Behind.....NCLB

Office of Career and Technical Education.....OCTE

Office of Employment and Training.....OET

Persistently Low Achieving.....PLA

Project Lead the Way.....PLTW

Race to the Top.....RTTT

School-Based Decision Making..... SBDM

School Improvement Grants ..... SIG

School-to-Work Opportunities Act ..... STWOA

Senate Bill 1.....SB1

Socio-Economic Status.....SES

Southern Regional Education Board.....SREB

Statistical Package for Social Sciences.....SPSS

CHAPTER 1: INTRODUCTION

In September 2009 at a nationally televised town hall meeting, United States Education Secretary Arne Duncan stated, "As a country, we need to prepare a lot more students to be successful in careers, a lot more students to be successful in college. When talking about college ready, career ready, we're really trying to do both" (North Carolina, 2009, p. 1). The Commonwealth has recognized the importance of students being college and career ready (CCR) and addressed a 2011 CCR rate of only 38% by adopting a new educational accountability model where 20% of a high school's total accountability is based upon these scores (Kentucky Department of Ed, 2011b).

This study examined the CCR results of a rural Kentucky high school that has been labeled as persistently low achieving (PLA), located in rural Appalachia. The statistical effects of career and technical education (CTE) programs indicated by test results for Armed Services Vocational Aptitude Battery (ASVAB), WorkKeys, Kentucky Occupational Skills Standards Assessment (KOSSA), and industry certifications were estimated to show the consequences for the school's accountability score. Low achieving high schools may tend to benefit disproportionately from CTE.

Background

For the last several decades, more than 90% of public high school graduates have earned credits in career and technical education (Hudson & Laird, 2009; Levesque 2003; Levesque, Laird, Hensley, Choy, Cataldi, & Hudson, 2008). According to the most recent statistics provided by the National Center for

Education Statistics (2009), 94.16% of students were enrolled in at least one CTE course in 2009 in the United States. A study also revealed that a larger percentage of full-time CTE schools have higher levels of poverty and were identified as limited English proficient compared with the proportions of English language learners in comprehensive high schools (Levesque, et al., 2008). In 2012, 43 states offered one or more career education programs leading to an industry-recognized certificate or credential (Natl Center for Ed Stats, 2012).

Current educational reforms offer multiple pathways for all students connecting secondary, postsecondary, and the workplace (Natl Center for Ed Stats, 2012). President Obama's reauthorization of Perkins IV mandates that states increase access to high-quality CTE opportunities particularly for students in rural or remote areas through increased use of services that foster success and improve the quality of career and technical education programs (Duncan, 2012). Race to the Top (RTTT) also ensures that rural economic needs are considered in the creation of high-quality CTE programs. Transformation of secondary schools at national and state levels has impacted career and technical education changing it from an alternative program to a college preparatory curriculum.

"The academic skills demanded by many entry-level jobs today are at a higher level than the academic skills required for postsecondary education" (Daggett, n.d., p. 1). Career and technical education is a significant element of any high school education (Natl Center for Ed Stats, 2012) with an emphasis on the integration of academics in CTE being a key ingredient to student success (Stone, Alfeld, Pearson, Lewis, & Jensen, 2006). The important role that it can play in

economic development was also recognized in a national summit on the Role of Education in Economic Development in Rural America (Bivins, 2010). Students participating in these programs are more likely to complete high school and transition to a postsecondary institution (Visher, Bhandari, & Medrich, 2004). Student participation in CTE is critical to the academic success of high school, college, and employee education in the 21st century (Kentucky Office, 2014).

Kentucky's newest accountability model is based upon the assumption that schools and teachers can improve students' performance by improving instruction (Holliday, 2012). This paradigm also places greater emphasis on college and career readiness for high schools and districts assigning the same point value to career readiness as college readiness (Kentucky Dept of Ed, 2012) holding career and technical education solely responsible for the career side of the model. Governor Steve Beshear wrote "there have been many moves to improve the system [CTE] in Kentucky, but we must seize this opportunity to 'get it right'" (Transforming Education, 2011, p. 30). "A unified vision of college and career readiness will empower every educational stakeholder to work more effectively in preparing all students to succeed" (Hyslop, 2011).

Statement of the Problem

To help bridge the gap between academics and skills training, this study focused on career and technical education programs offered to students at a PLA high school in a rural Appalachian part of Kentucky. The researcher became particularly interested in how the results on ASVAB, WorkKeys, KOSSA, and

national industry certification of high school students have impacted the college and career readiness results for the high school.

The 2011 Unbridled Learning College/Career Readiness Brochure declared only 38% of high school graduates in Kentucky were considered college/career ready (Kentucky's Plan, 2011b). Students are considered to be college ready if they meet the Council on Postsecondary Education (CPE) system-wide benchmarks for the ACT of 18 for English, 19 for Mathematics, and 20 for Reading. Students may also qualify for college ready if they meet the benchmarks for the KYOTE or COMPASS placement tests.

Students are considered to be college and career ready if they meet the college readiness requirement and the requirements for the technical section of career readiness. The state recognizes the KOSSA and industry certificates as requirements for this component of CCR. Students who do not qualify for college- ready status may be considered career ready if they meet career-ready academic benchmarks for ASVAB or WorkKeys in addition to the technical requirements. Thus, a career ready student is a student who is preparatory in a career and technical education career major and has reached the benchmarks on WorkKeys or ASVAB and KOSSA or an Industry Certification.

Literature is lacking on the effects and impact of Kentucky's career and technical education programs on college and career readiness. This age of education reform in the Commonwealth is new in that career and technical education leaders play nearly co-equal roles with academic education leaders. This study should help support the importance of both academic and technical

leaders working together to help meet college and career readiness and provide additional literature to support Senate Bill 1 (SB1) of 2009 and the state's CCR portion of the Unbridled Learning accountability model.

Significance of the Study

This study centered on how completion of career pathways offered to secondary students impacted CCR accountability results as required in Kentucky's new Unbridled Learning Accountability model. The study was based on individual student scores for ACT, COMPASS, KYOTE, ASVAB, WorkKeys, KOSSA and Industry Certification.

This study explores the impact of CTE on CCR accountability for a persistently low achieving school located in the Appalachian part of Kentucky. Useful information should be provided to policy stakeholders (legislators, Kentucky Board of Education [KBE], KDE, Office of Educational Accountability (OEA), educational administrators, and business personnel) in making decisions regarding appropriate instruction and programming for college and career readiness to help promote economic growth for rural areas and educational attainment for rural youth. These stakeholders should work together to provide more of these programs to help fill the skills gap that is missing in entry level jobs and help decrease poverty in rural areas. This research can also inform others of the link between Kentucky's area technology centers and feeder high schools and the impact that career and technical education can have on college and career readiness.

The findings of this study provide evidence that an increased focus on integrating academics with CTE contributes to student achievement as measured by Kentucky's new measures for CCR as well as preparing students for the advanced technological and knowledge-based workplace. In addition, it might also have several implications for school counselors in designing and developing career development programs. Counselors should provide activities that provide learning experiences for students so they might better understand their unique career-related set of interests and skills (Tang, Pan, & Newmeyer, 2008). Blackhurst, Auger, and Wahl (2003) found students often make incorrect generalizations about jobs based on their personal experiences and overestimate the education required for even jobs that were familiar to them and have a limited understanding of postsecondary education options. This trend may have a negative influence on a child's educational and occupational aspirations.

Research Question

What impact do career and technical education preparatory students have on the college and career readiness accountability results for a persistently low achieving high school in rural Appalachia Kentucky?

Hypotheses

Null: CTE preparatory students do not have a greater impact on CCR for a PLA high school located in a rural Appalachian part of Kentucky than non-preparatory students.

Alternative: CTE preparatory students have a greater impact on CCR for a PLA high school located in a rural Appalachian part of Kentucky than non-preparatory students.

Conceptual Framework

The conceptual framework as outlined in Figure 1.1 shows the relationship of variables included in the analyses. The research tells the story required to answer the question addressed in this dissertation and includes a description of research available for each variable. As a result of federal and state legislation, the hypothesized path model illustrates the impact of CTE on CCR using Kentucky's new accountability model. The specific tests required for the college and career readiness academic measures are ACT, COMPASS, KYOTE, and WorkKeys. The requirements for the technical component are KOSSA and Industry Certification.

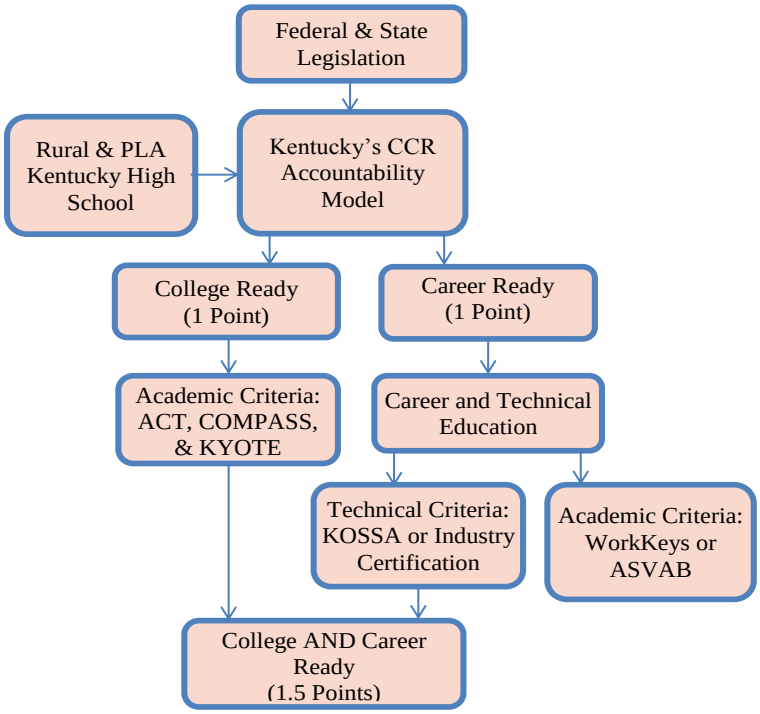

Figure 1.1. Concept Map of Research

Assumptions, Limitations and Delimitations of the Study

This study is limited to a discussion and literature review of the impact of Kentucky's Senate Bill 1 of 2009 on CTE and CCR since legislation and the state's new accountability model includes many initiatives. This dissertation was based on a single case chosen entirely for reasons of convenience. The sample is drawn from a population of a rural high school located in an Appalachian county in Kentucky. The high school is served by two area technology centers (ATCs).

ATCs are operated by the state through the Office of Career and Technical Education (OCTE) and are assigned to offer additional CTE pathways to high schools in the county where they are located as well as surrounding counties. Taking this into consideration, some students may find it too difficult to attend an ATC due to scheduling issues. Also, due to austere economic conditions and limited resources of the state and local districts, it is possible that results could have impacted the number of students being transported to a center due to limited funding for busing, thus having an effect on student choice for preferred career pathways.

While the breakdown of program matriculation is outside the scope of this study, it is implicit that analysis of enrollment capacities is vital to administrative decisions to improve CCR scores to increase the number of preparatory students who are enrolled in pathways of student interest. It is understood that actual student enrollment may be the result of convenience, scheduling, transportation, and student partiality based on uncontrolled variables such as student preference for a teacher or student desire to take the same course as another student.

The results of this review are limited to the findings based upon Kentucky's current accountability model for college and career readiness. The 2012 and 2013 college and career readiness results for secondary students represent only the first and second years of data for the high school since the new accountability model was adopted. Thus, it must be understood that transition to a new model takes time for everyone to understand and embrace and a replication of this same study in the future should be considered. Other states may also wish to conduct the same type of study on their accountability model.

This research does not include analysis of career and technical education programs offered at the post-secondary level. This study assumes equal effectiveness of instruction in all programs, facilities, and instructional pedagogies across the state. It does not analyze the ability of teachers, age or condition of facilities and equipment or subsequent impacts on instruction. Rather, it is assumed that CTE instruction offered to students at the high school being studied is adequately aligned with skilled training needed by business and industry and is sufficient for secondary students to enter the workforce.

In a study on accountability, Kentucky's Commissioner of Education, Terry Holliday (2012), stressed the importance of documenting the existence and extent of anticipated and unanticipated consequences to the accountability system to safeguard against negative responses. "The function of education is largely structured around the economic roles that students will play later in life" (Schafft & Jackson, 2010, p. 278). Thus, the role of education is to have an end product of participants who are flexible, adaptable, and mobile to meet the needs of the labor

force who can react to the ever-changing national and global labor market and economy.

Definition of Terms

21st-century skills: ability to work with others, problem-solving, public speaking, and maintaining a professional, positive attitude (Transforming Education, 2011) technology literacy, the ability to analyze and apply knowledge, and a knack for working effectively with colleagues in teams (Sawchuk, 2009).

Career Clusters: Occupations grouped under industry classifications and similar technical skills.

Career Pathway: A coherent, articulated sequence of rigorous academic and CTE courses that lead to rewarding career; begins in the ninth grade and leads to a baccalaureate degree, an industry recognized certificate, and/or licensure; developed, implemented, and maintained in partnership with secondary and postsecondary education, business, and employers; available to all students, including adult learners,

Exploratory Student: Student not completing and or not taking the minimum number of three career and technical education courses in a program area.

Persistently Low Achieving High School: A title I school that has been identified for improvement, corrective action, or restructuring based on averaging the percentage of proficient or higher in reading and mathematics on the state assessments and failed to make AYP for three consecutive years or has a

graduation rate of 60% for three consecutive years and is in the lowest 5% of all Title I schools.

Preparatory Student: Student enrolled in or having completed at least three courses in a given career and technical education program area with a minimum grade of "C".

TEDS: Kentucky's technical education database used to collect and report data associated with Carl D. Perkins federal funding as well as documentation required for CCR.

Unbridled Learning Accountability Model: Kentucky's most recent accountability model adopted 2012 school year.

Standards: Term used by schools to describe what students must know and be able to do in order to graduate from high school ready to succeed in college and a career (Fayette County, 2013).

CHAPTER 2: LITERATURE REVIEW

President Obama embraced school reform in his 2012 State of the Union Address with a blueprint for the economy which included career and technical education transformation ensuring every student is prepared for college and a career (Duncan, 2012). The blueprint for the reauthorized Perkins Act revamps the system bringing "a new era of rigorous, relevant, and results-driven CTE…[using] a combination of technical assistance, competition, and a system of structured rewards to ensure that more students, regardless of backgrounds or circumstances, have access to high-quality CTE programs" (Duncan, 2012, p. 2).

Career and Technical Education

Elliot and Deimler (2007) promote career and technical education as the premier educational delivery system in the country and suggest it has always been rigorous, relevant and relationship building and one that others model during tough educational reform.

The ultimate irony is that we have had the best and most effective teaching strategies since our beginnings, but because of what we emphasized as "Determinants of Excellence" throughout our history, we have a ways to go to get others to believe that career and technical education has a place in today's education for all students (Elliot & Deimler, 2007, p. 46).

Academic readiness was not emphasized for traditional vocational programs at the high school level even though a 2006 study conducted by American College Testing (ACT) suggests the success of secondary students in the workplace and college require the same level of academics for them to be

competitive in the workplace (ACT, 2006; Boykin, Dougherty, & Lummus-Robinson, 2010; Regan, 2008; Saylor, 2008). Over time, programs matching various industrial categories were developed, each with separate teacher certification programs and state administrators (Cohen & Besharov, 2002, 2004). As a result of the separation of vocational from academic education, career and technical education was often overlooked by high school principals and school superintendents with comprehensive high schools emerging with work-ready programs being a separate track from academics.

> By creating a whole new system rather than strengthening CTE—and then by emphasizing services for the broad student population, rather than those who are not college-bound—Congress and the nation's schools missed an opportunity to help non-college youth find their place in a changing economy. (Cohen & Besharov, 2002, p. 17)

Studies conducted by Elliott and Deimler (2007) revealed that CTE students do not perform as well on high-stakes tests when looking at just the raw scores, because these programs attract students whose learning styles and other characteristics do not accommodate for this type of standardized test. The raw score comparisons are inappropriate because the groups are different. However, when the appropriate extraneous variables are controlled and built into the equation, there usually is no difference among the students on these tests. Elliott and Deimler (2007) also pointed out the raw score comparisons are inappropriate because the groups are different. Research results point to the differences in

scores between the groups being attributed to the effects of the extraneous variables and not because of curriculum choice.

The results of a study conducted by Hagen (2010) indicated that CTE coursework provides stable ground for high school graduates as evidenced by attendance rates, course-taking patterns, survey analysis, dropout frequency, graduation potential, and interviews. Participation in these courses had a positive impact on postsecondary decision making and student development by contributing to the development of self-competence and confidence. Findings indicated that students had a better understanding of what they would pursue as they prepared for post-high school careers and learned to embrace the potential of career and academic integration in making decisions. What is important is to focus the requirement on technical skill development of the students which will give readiness to students to become more sophisticated decision-makers and develop skills earlier which will be of help in their future careers.

There appears to be some contradicting viewpoints about which programs are CTE and which are general education (Wicklein, 2006; Wright, 2004; Wright, Washer, Watkins, & Scott, 2008). Technical education programs having a major emphasis on design and engineering have been scrutinized to the point that some believe that certain technical courses are a part of general academic education. Others feel strongly that they are career and technical education programs because of a strong emphasis on pre-engineering. A study conducted by Wright, et al., (2008) indicated the primary focus of pre-engineering programs such as Project Lead the Way® (PLTW) were career and technical by nature. The majority of

respondents indicated it was college prep, even though most students enrolled in the program were not college bound as those in other pre-engineering programs and struggled to make it a core academic course as is math and science.

Most states classify technical education as CTE (Wright, et al., 2008). However, leaders in the field of technical education would like it to be classified as general education even though respondents indicated career and technical education was its primary purpose. In general, it is believed that every student should have the opportunity to participate in technical education as part of general education requirements (Raizen, Sellwood, Todd, & Vickers, 1995).

Career and technical education programs have been stigmatized at the secondary level as a program for students who are not academically inclined and thus are not expected to go to college (Cohen & Besharov, 2002, 2004; Daggett, 2003; Levesque, 2003) causing students to be tracked into one of two routes, academic or vocational (Levesque, 2003). Mitkos and Bragg (2008) noted that students with lesser abilities were "constrained" (p. 376) while higher achieving students were advised to follow "a more prestigious route" (p. 376). At one point, 25% of students were being placed in vocational tracks and not expected to attend college thus, conflicting with the belief that all students should have the opportunity for college (Levesque, 2003). Studies also revealed that counselors were advising students for college and tracking them into one of two routes, community college or a four-year college (Mitkos & Bragg, 2008). The Southern Regional Education Board (2006) reported that high schools and colleges must work together to define college readiness standards and that it includes a

concentration in career and technical education to avoid remediation at both levels of education.

Employers and students in multiple studies conducted during the 1990s felt students were being turned away from career and technical education and blue-collar jobs because counselors were pushing college for everyone (Cohen & Besharov, 2002, 2004). Employers indicated that a skilled worker would make more than a college graduate if they were able to find individuals with the necessary occupational skills, indicating schools were not doing their job. Even during the last few years of high unemployment, employers are struggling to find skilled technicians to fill positions in the fields of health, technology, and advanced manufacturing (Duncan, 2012). "Strengthening all aspects of our education system and creating high-quality job-training opportunities are necessary to further our economic prosperity as a nation and to keep the American promise alive for all of our students" (Duncan, 2012, p. 2).

Integrated learning opportunities are now being utilized for all students in lieu of the vocational or college-bound tracking system (National Assoc of State Directors, 2010). The National Career Clusters model organizes high school classes around job occupations to boost real-world relevance allowing the school to excel in leadership, standards, and student achievement. Career pathways provided under each career cluster require students to be concentrators, taking at least four credits in a CTE pathway to be a completer and graduate, preparing high school students for high-wage, high-skill, and high-demand occupations and further education (North Carolina, 2009). Students are better equipped to graduate

and continue their postsecondary education or enter the workplace. The vision is for students to view the program as an integral part of the "whole school experience" (North Carolina, 2009, p. 8).

The literature indicates ignorance among stakeholders about the field of CTE (Wright, et al., 2008). The role, purpose, and goals of this type of education have never been explicit and vary with both internal and external groups being debated for more than 60 years (Daugherty & Wicklein, 1993; Erekson & Shumway, 2006; Wright, et al., 2008). The federal government could potentially play an important role in the effort to promote CTE by sponsoring high-quality research (Cohen & Besharov, 2002, 2004). United States Secretary of Education, Arne Duncan (2012) emphasized, "strengthening all aspects of our education system and creating high-quality job-training opportunities are necessary to further our economic prosperity as a nation and to keep the American promise alive for all of our students" (p. 2). Addressing perception will require the collaborative efforts of all educational stakeholders both internal and external to CTE (Wright, et al., 2008).

> While CTE has been proven to give young people the technical and professional skills demanded in today's jobs, it remains one of public education's best-kept secrets. . . . Students, teachers and business leaders must recognize CTE grows workforce skills demanded by jobs in 21st century industries. . . . We have squeezed the last drop of juice from the one-size-fits-all model of education. (North Carolina, 2009, p. 1)

Academics is said to follow a single course format whereas CTE is recognized as a sequence of classes (Gordon, Yocke, Maldonado, & Saddler, 2007). Studies show CTE students are transitioning to college with some program areas having higher transfer than academic areas. These programs require academic competencies in addition to physical labor allowing students professional and semi-professional employment as well as blue-collar jobs. The need for such formal, systematic career education efforts is particularly apparent in light of finding that students' ability to assess vocational preparation requirements did not improve significantly between elementary school and the senior year of high school. Absent such information, those students who do not have the academic ability, the financial resources, or the motivation to attend a four-year institution will be handicapped in their ability to make realistic vocational plans and successfully navigate the school-to-work transition (Blackhurst, Auger, & Wahl, 2003). Data show CTE improves rates for graduation, higher achievement in school, and percentage of students continuing their postsecondary education or advanced training. CTE is recognized as being the educational vehicle that will provide the education and training necessary to stimulate the economy and prepare the future workforce.

Ethnographic studies documenting what people actually do on the job, required personality characteristics, as well as econometric studies of returns to different levels of education and other experiences provide a mixed picture of the types of skills required by business and industry (Cohen & Besharov, 2002, 2004; Rosenbaum, 2001). Studies infer that employers seek workers with specific CTE

training, soft skills, and academic skills, but not necessarily those required at the post-secondary level. One study indicates that students taking CTE courses exhibit better soft skills than non-CTE students (Castellano, Stringfield, & Stone, 2003).

The perception of vocational education as a dumping ground for the poor and less academically inclined students (Cohen & Besharov, 2002, 2004; Daggett, 2002; Levesque, 2003) was acknowledged as a great concern in 1994 by the U.S. Department of Education (Cohen & Besharov, 2002, 2004). Attention was brought to areas such as lack of homework and inadequacy of course sequences not meeting the federal requirements of academic and vocational courses. Vocational education was asked to respond by shifting its philosophy to industries rather than occupations with an added emphasis on college. It was during this time that the American Vocational Association (AVA) adopted a name change to avoid the stigma of vocational and became known as the Association for Career and Technical Education (ACTE). The organization also encouraged its members to adopt the new classification of CTE as opposed to vocational. Perkins Acts of 1990 and 1998 were introduced with a new focus on program improvement, standards, and academics for career and technical programs. Funding for special populations was reduced and data on key performance indicators were set in place.

Castellano, Stone, Stringfield, Farley, and Wayman (2004) conducted a longitudinal study of the effects of career and technical education on reading and math scores of students in poor communities at three schools in the United States.

The study revealed student participation in these programs yielded greater growth in both reading and math than other students. Yet, a study conducted by Daugherty and Wicklein (1993) found that math and science teachers' perception of technical education programs were significantly different from those of technical education teachers. This illustrates there continues to be a need to study and improve the perception of technical education (Erekson & Shumway, 2006; Wright, et al., 2008).

For several decades these courses have become increasingly common in American high schools providing services to nearly half of all high school students, with a disproportionate number of these being low income or otherwise disadvantaged (Levesque et al., 2008). According to the most recent statistics provided by the National Center for Education Statistics (2009), 94.16% of students in the United States were enrolled in at least one of these courses. Studies reveal that a larger percentage of schools offering only career education have higher levels of poverty and were identified as limited English proficient (LEP) than comprehensive high schools.

By 2002, 88% of all public secondary schools offered CTE courses and 96.6% of students graduated with one or more credits (Hudson & Laird 2009; Levesque, 2003; Levesque et al., 2008). Of the 18,000 public high schools in the country, about 5% (n=900) are solely career and technical education centers offering courses to just under half (48%, n=8,200) of these schools. A slight majority of secondary schools (52%, n=8,900) provide career and technical courses in-house as part of the comprehensive high school's curriculum.

NAEP test scores between 1994 and 2000 indicate students concentrating in CTE increased their reading performance by 8 scale points and 11 scale points in mathematics (Levesque et al., 2008; Silverberg, Warner, Fong, & Goodwin, 2004). In the same study, non-CTE students increased their performance in reading by only four points with no increase in mathematics (Silverberg et al., 2004).

CTE and Education Reform

Examination of history cannot provide "tidy lists of lessons" (Kantor & Tyack, 1982, p. 239) to evaluate educational policies, but it can provide a perspective of former theories and policies. Some educational historians paint a picture of the development of schools as one of sudden changes in direction resulting in new models for theory and practice. Examples of this can be seen in the various interpretations of "vocationalism" in American education. It appears the turning point was the early 1900s when vocational principles and practice became a permanent part of the education system characterizing the twentieth century as the century of vocationalism.

Federal legislation and funding for career and technical education can be traced as far back as the 1917 Smith-Hughes Act (Patterson, n.d.) with a large amount of national dollars still being made available through Race to the Top (RTTT), America's newest educational reform initiative (Duncan, 2012). Currently, at the federal level, sweeping changes in education reform are being addressed with RTTT initiatives with unprecedented funding.

At the turn of the 1900s, Rufus Stimson's belief that students learn academics better in an applied setting prompted him to quit his job as president of Connecticut Agricultural College (now the University of Connecticut) to become a high school teacher (Elliot & Deimler, 2007). "This became the beginnings of vocational education and was the impetus for including experiential education activities within vocational legislation" (Elliot & Deimler, 2007, p. 36). Vocational education emerged at the turn of the twentieth century to assist with economic transformation and the needs of the business community for skilled labor associated with the expansion of industrial capitalism, and to the first time entry of large numbers of working-class students into high school (Cohen & Besharov, 2002, 2004; Kantor & Tyack, 1982).

Native Kentuckian, Representative Carl D. Perkins of Hindman, Kentucky, is probably one of the most influential federal politicians having the greatest impact on vocational education. President Regan recognized the Congressman's passion for vocational education and renamed the 1964 Vocational Education Act to the Carl D. Perkins Vocational Education Act of which Perkins was instrumental in getting approved (O'Hara, 2009). The 1964 legislation provided the first federal funding for vocational schools and may have been inspired by Kentucky's model of area technology centers, commonly referred to as ATCs. The act was one of the first to address vocational education for poor and disabled students in economically depressed communities (Cohen & Besharov, 2002, 2004).

The 1983 landmark report known as *A Nation at Risk* identified deficiencies in levels of standards within public schools bringing about significant changes in education policy (Sanders & Jordan, 2000). The report addressed the need for all schools to concentrate on academics by increasing rigor and standards (Cohen & Besharov, 2002, 2004). To answer this call, more academic courses were required for high school graduation and admittance into state-operated post-secondary institutions. Grubb (1997) noted that sacrificing skills training for increased emphasis on academics is an educational compromise.

In response to *A Nation at Risk*, President Ronald Reagan signed the Carl D. Perkins Vocational Education Act in October 1984, commonly referred to as Perkins I (PCRN, 2011). To address disadvantaged groups, Perkins was reauthorized in 1984 bringing about an increase in the percentage of poor and disabled students in career and technical programs (Cohen & Besharov, 2002, 2004; O'Hara, 2009). Perkins was reauthorized as Perkins II in 1990, Perkins III in 1998, and as Perkins IV in 2006 (PCRN, 2011).

The 1990s introduced a special model of CTE referred to as Tech Prep (Bragg, Loeb, Gong, Deng, Yoo, & Hill, 2002). The program required career pathways to be put in place showing a plan for transition from high school to college entailing a formal articulated agreement between the secondary and post-secondary institutions. This reform model was implemented as a concept built upon various theories of articulation, integration of academics, and occupational training that link secondary and postsecondary educational systems (Sabie, 2008). "It prepares students for high-skill occupations and allows either direct entry into

the workplace after high school or continuation of study leading to an associate or baccalaureate degree in a four-year program" (Sabie, 2008, pp. 51-52).

In 1994, the School-to-Work Opportunities Act (STWOA) was passed to address high school students' need for work-place training and additional education requiring collaboration with employers, colleges, and other partners (Cohen & Besharov, 2002, 2004; White & Medrich, 2002). The Act was signed into law by President Bill Clinton and established the formation of a performance measurement system requiring students to participate in both school and work-based learning activities that sought to improve student performance (White & Medrich, 2002). Exposure to work experiences and learning environments has been proven to measurably influence educational aspirations of students (Rottinghaus, Lindley, Green, & Borgen, 2002; Tang et al., 2008). However, putting work-based learning into practice is difficult and comes at a high price, much more so than conventional classroom instruction.

During the time of STWOA, 1994 through 2001, funding was provided for integration of academics and vocational instruction of work-based learning activities (Cohen & Besharov, 2002, 2004; White & Medrich, 2002). These activities were embedded in a larger set of educational experiences established to improve student performance. The act had a dual role of preparing non-bound college students for the workplace as well as introducing other work-based learning activities such as job shadowing, school-based enterprises, service learning, unpaid internships, cooperative education, and career awareness classes to address the needs of all students.

Phelps (2002) notes that Public Law 107–110 was introduced at the national level on January 8, 2002, and is commonly referred to as No Child Left Behind (NCLB). This is the most current educational reform with mandatory implementation at the national level (Konz, 2013). Earlier versions of ESEA included mandates for college and career readiness, addressing the need for academically skilled workers and the perception of education for the workplace (Daggett, 2002). However, NCLB neglected secondary education putting greater emphasis on kindergarten through eighth grade with a competency component requiring mastery of academics rather than special preparation for employment and the need for skilled employees (Phelps, 2002).

In 2005, high schools were referred to as "the front line in America's battle to remain competitive on the increasingly competitive international stage" (Schafft & Jackson, 2010, p. 277) mirroring the language in the 1983 report of *A Nation at Risk.* The need for highly skilled workers requiring college credentials is now a necessity for individuals wanting to assure their place in the middle class (Carr & Kefalas, 2009). As the workforce demands increased with the need for individuals to acquire an advanced education, high schools could be viewed as the "unequalizer" if they are not able to educate all students, especially those from low socioeconomic backgrounds (Hoffman, Vargas, Venezia, & Miller, 2007).

The 2006 Perkins Act (Perkins IV) acknowledged career and technical education's organized programs as preparing students for employment not requiring a baccalaureate degree (O'Hara, 2009). The Carl D. Perkins Career and Technical Education Improvement Act of 2006 defined career and technical

education as educational programs offering a sequence of courses and provided the framework for CTE in many states such as North Carolina (North Carolina, 2009). Inclusion of academic and technical courses offers a distinct rationale for secondary schools requiring students to complete a pathway of courses preparing them for college and a career (Hagen, 2010; Hargis, 2010; Kentucky Dept of Ed, 2011b, Kentucky's Plan, 2013). In 2010, President Obama reauthorized Perkins IV reiterating again the need for skilled workers.

Current Perkins legislation mandates that states increase access to high-quality career and technical education opportunities particularly for students in rural or remote areas (Duncan, 2012). Four core principles are addressed reflecting a commitment to ensure that more students have access to high-quality CTE programs: (1) alignment between CTE programs and labor market needs that prepare students with 21st-century skills for in-demand occupations in high-growth industry sectors; (2) collaborations among secondary and postsecondary institutions, employers, and industry partners to improve the quality of CTE programs; (3) accountability for all students to improve their academic and technical and employability skills; and (4) innovation supported by systemic transformation of state policies supporting CTE at the local level.

President Obama acknowledged that individuals would likely remain in poverty if an individual does not obtain an education (Full Text of Obama Speech, 2008). The RTTT program and its policies are focused on closing the gap between K-12 education and postsecondary education, acknowledging those in need of education and training are those caught in the cycle of welfare and poverty

(Johnson & Stephens, 2012). Education should be accessible to all, regardless of social-economic status. In 2012, United States Secretary of Education, Arne Duncan declared,

> This commitment stems from the fact that the everyday educational experiences of women, students of color, students from low-income families, and students with disabilities, both in secondary and postsecondary CTE programs, violate the belief in equity at the heart of the American promise. The nation cannot lead the world in college graduates unless we extend educational opportunity to everyone—fairly and equitably. (p. 2)

Currently, national education reform places greater emphasis on college and career readiness standards for all students (Bryan & Holcomb-McCoy, 2010) with the overhaul of NCLB and the nation's newest educational initiative, Race to the Top (Johnson & Stephens, 2012). The initiative is scheduled to replace NCLB after all phases of the new plan have been introduced (Duncan, 2012). In 2009, President Obama and his administration launched the plan for RTTT which includes a competitive grant program comprised of six priorities designed to help states reform their current educational systems. To meet this challenge, today's schools are confronted with ways to remove barriers and provide appropriate, relevant and worthwhile experiences in academics and technical education for every student.

If students cannot validate and obtain the skills needed for success after high school and the workplace, they will not be able to compete in the 21st

century (Regan, 2008). Resources that aid in improving and certifying student readiness for further education or employment in this competitive world will be invaluable tools in the educator's toolkit and can provide a realistic path to the necessary change in our education system (Saylor, 2008). Most studies demonstrate that career and technical educational programs have a positive impact on college and workforce readiness (Hagen, 2010) especially with the increased focus on postsecondary attainment through articulation and dual credit opportunities being made available to secondary CTE students (Kentucky Office, 2012).

Federal legislation has changed its focus over the past half century to stress integration of academics and career and technical education preparing students for college and a career. (O'Hara, 2009). A crucial goal of national education reform is to address CCR standards for all children (Bryan & Holcomb-McCoy, 2010). Schellenberg and Grothaus (2011) acknowledge the plea is to deliver culturally competent responsive services to improve student academic performance and to address behaviors that act as barriers to achievement. The demand to remove the barriers to student success and respond to the needs of all students has been echoed throughout national and state education arenas.

Kentucky's Accountability Model for CCR

"Unbridled Learning is the name given to the new era in public education in the Commonwealth of Kentucky - designed to ensure every child reaches his/her learning potential and graduates from high school ready for college and career" (Kentucky Dept of Ed, 2012, p. 1). The new accountability model is

comprised of five components that contribute points to the overall score of a school and district (Floyd & Hargis, 2012, 2013a, 2013b; Kentucky Dept of Ed, 2012). The five components are achievement, gap, growth, college and career readiness, and graduation rate with the ultimate goal being to ensure all students are college and career ready. As a part of the Unbridled Learning Accountability Model, college and career readiness accounts for 20% as does each of the other four components. The new standard for CCR places great emphasis on career and technical education holding administrators and teachers of these programs accountable for the academic and technical components of career readiness. The model is based upon the assumption that schools and teachers can improve students' performance by improving instruction (Holliday, 2012).

As O'Hara documented in 2009, Kentucky has kept career and academics separated since 1964 when The Commonwealth's legislation established state-operated vocational centers electing to organize vocational education with its own visible identity and authority. Leaders choose not to have vocational training established under the comprehensive high school structure as it was in many other states at that time. Today CTE in Kentucky is an essential component of the high school curriculum having a vital role in the successful transition of high school students (Kentucky Office, 2014). Its mission is "to assist schools in providing students with skills necessary for a successful transition to postsecondary education or work and a desire for life-long learning in a global society" (p. 1). As of July 2010, Kentucky provided career and technical education at "219 high schools, 118 middle schools, 44 locally-operated centers or departments, and 54

Area Technology Centers" (Transforming Education, 2011, p. 30). Results show 67% of high school students were enrolled in these programs representing as much as one third of some students' high school experience. Kentucky's State Report Card (2013) revealed that 43,879 students, males (N = 22,079) and females (N = 21,797), graduated from Kentucky public high schools with 21,673, males (N = 10,244) and females (N = 11,428) reported as college ready and 5,158 males (N = 2,885) and females (N = 2,273) being career ready. College and/or Career Ready reports an unduplicated count of 23,756 males (N = 11,523) and females (N = 12,231).

Currently, Kentucky is following the nation's lead and addressing CCR at the state level as one of the many initiatives of Senate Bill 1 of 2009 (Kentucky Dept of Ed, 2011b; Kentucky Council on Postsecondary Ed, 2011). SB1 called for an external valid and reliable evaluation measure to be developed for college and career readiness with the stipulation that career readiness measures meet the same rigorous level of evidence as the college readiness measure (Transforming Education, 2011; Winters et al., 2009). Transforming Education in Kentucky (2011) suggests "there have been many moves to improve the system [CTE] in Kentucky, but we must seize this opportunity to 'get it right'" (p. 30). Resources must be provided that aid in improving and certifying student readiness for further education or employment to provide a realistic pathway to the necessary change in the education system (Saylor, 2008). To meet this challenge, leaders must learn from previous mistakes and successes of vocational initiatives (Daggett, 2002).

Transforming Education in Kentucky (2011) refers to a report from Southern Regional Education Board (SREB) that states "high school career and technical studies are essential for achieving state goals for graduating more students and graduating them ready for work, advanced training, and college" (p. 28). Suggestions are given to link CTE with a college-ready academic core, preparing students for work and post-secondary education. Career and technical education will provide the means for bringing the poly-technical model for differentiated instruction with career-focused programs. The integrated contextualized learning offered through CTE programs allows students to make the necessary connection with academics. "Thus, their questions regarding 'Why do I need to know this?' or 'When will I use this?' are answered" (Transforming Education, 2011, p. 29).

Governor Steve Beshear signed Senate Bill 1 into law on March 26, 2009 (Transforming Education, 2011; Winters et al., 2009). SB1 addresses many areas – what will be tested, how subjects will be tested, when tests are given, what should comprise the public school accountability system and more (Kentucky Dept of Ed, 2011b). KDE proclaimed Kentucky is on the brink of a new age of public school assessment and accountability with its most recent education reform designed to improve teaching and student learning in Kentucky. All public school districts were required to implement the new assessment and accountability system referred to as Unbridled Learning during the 2012 school year.

Kentucky defines career readiness as "the level of preparation a high school graduate needs in order to proceed to the next step in a chosen career,

whether that is postsecondary coursework, industry certification, or entry into the workforce (Transforming Education, 2011). Governor Beshear's "task force members believe that a single test score alone should not be the measure of college- and career-readiness" (Transforming Education, 2011, p. 20). According to the Association of Career and Technical Education (ACTE), career readiness includes core academic skills and the ability to apply those skills to concrete situations in the workplace and in routine daily activities such as critical thinking and responsibility, as well as employability skills that are essential in any career area (Transforming Education, 2011). This component also includes technical, job-specific skills related to a specific career pathway.

One of the newest educational challenges facing Kentucky school districts is how to meet College and Career Readiness accountability measures as required for high school students with the legislation of Senate Bill 1 in 2009 (Kentucky Dept of Ed, 2011b; Kentucky Council on Postsecondary Ed 2011; Transforming Education, 2011; Winters et al., 2009). Education reform is inevitable and ongoing, yet "in spite of education reform efforts, students continue to be plagued by low academic achievement and underachievement, a disproportionate number of discipline referrals, and high dropout rates" (Bryan & Holcomb-McCoy, 2010, p. 43).

According to Rosenbaum (2001), the real contributor to the education problem in America is the lack of interaction between employers and high schools and not poor student skills or lack of job opportunities as deemed by most critics. The college-for-all myth pushed by educators hinders students from making

realistic plans and shackles both non-college students and those who do not finish college trapping them in low-wage, dead-end positions with few incentives to achieve. Faced with these challenges, students become lazy in high school lacking the type of attitude necessary for the 21st century workplace. To address this dilemma old stereotypes must be broken down to develop a practical framework for finding solutions to meet the skills training required of today's workplace. Addressing this issue will require a paradigm shift in how we look at schools and the world of work to help bridge the gap.

Kentucky is currently ranked 10th in national education rankings, thus making progress in the area of education (Matthews, 2013) and has led the national movement to increase accountability through improved teaching and student achievement (Commonwealth of Kentucky, 2013). Kentucky's waiver of NCLB in 2011 allowed for the adoption of its own model of education accountability referred to as "Unbridled Learning" (Konz, 2013). Kentucky's Governor, Steve Beshear, understands the need to "create a career and technical education system that is a first choice, not a last chance" (Commonwealth of Kentucky, 2012, p. 1).

Kentucky addressed the nation's requirement in tackling college and career readiness at the state level with a new accountability model as one of the many initiatives of SB1 of 2009 (Kentucky Dept of Ed, 2011b). Kentucky's newest accountability paradigm places greater emphasis on career readiness for high schools holding CTE solely responsible for the career readiness portion (Kentucky Office, 2014. The new model assigns the same point value to career

readiness as it does college readiness making the stakes greater than ever before for career and technical education.

Governor Steve Beshear wrote "there have been many moves to improve the system [CTE] in Kentucky, but we must seize this opportunity to 'get it right'" (Transforming Education, 2011, p. 30). In a "move to help produce the skilled workforce businesses require today and in the future, Governor Steve Beshear today [August 28, 2012] signed an executive order overhauling the state's career and technical education system" (Commonwealth of Kentucky, 2012, p. 1). It is imperative that educational stakeholders understand the important role CTE plays in meeting accountability and the necessity of students' completion of career pathways, otherwise, schools will fall short of meeting these educational requirements allowing history to repeat itself with CTE once again be stigmatized as a dumping ground and under estimated in educational reform. Career and technical education is a critical element in meeting the academic, career exploration/preparation, and leadership development of high school students with a mission to provide them with the skills necessary for successful transition to college and/or work (Kentucky Office, 2013). It is an essential component of the high school curriculum representing as much as a third of students' high school experience.

In 2009, Kentucky's Governor, Steven Beshear, established an educational task force that acknowledged a single test score alone should not be the measure of college and career readiness (Transforming Education, 2011). Governor Beshear declared "Our students need an education system that provides job-

training and learning opportunities that will put them on a career pathway. Transforming and elevating CTE is essential to this process" (Transforming Education, 2011, p. 1) with interdisciplinary learning being an important component (Cohen & Besharov, 2002, 2004; Hull, 2003; Kentucky Council, 2011; Transforming Education, 2011).

Career and technical education provides unique opportunities for interdisciplinary learning (Cohen & Besharov, 2002, 2004; Hull, 2003; Kentucky Council, 2011). Contextual and interdisciplinary learning require collaboration from both the academic and technical instructors (Cohen & Besharov, 2004). An example can be found when students are learning the machining process. Students must integrate their knowledge and skills of manufacturing with algebra processes for successful completion. Interdisciplinary learning can enhance student learning as well as provide the student with rationale for learning mathematical concepts. Rose (2007) found the "manufacturing engineering (CTE program) provides a relevant context from which to envision interdisciplinary learning experiences because engineers integrate their knowledge and skills of manufacturing and algebra processes in order to plan the efficient manufacture of products." However, planning for such projects requires collaboration from both the academic and technical instructor. Excellent opportunities are provided with interdisciplinary learning activities that enhance student learning putting the program as a strong advocate for mathematics education (Rose, 2007).

College Ready: Must meet benchmarks on one of the following	**Career Ready: Must meet benchmarks for one requirement in career academic area and must meet one requirement in career technical area**		**Bonus: College AND Career Ready must meet at least one from each area**	
College Ready	Career Ready **Academic**	Career Ready **Technical**	College Ready **Academic**	Career Ready **Technical**
ACT English—18 Math—19 Reading—20 Or COMPASS English-Writing Skills—74 Math—36 Reading—85 Or KYOTE Reading—20 Writing—6 Math—22 Algebra—14 Calculus—TBA	ASVAB Score of 50 or greater Or WorkKeys® Silver (4) or better in each area (Applied Math, Locating Information, Reading for Information)	KOSSA Or Industry Certification	ACT Or COMPASS, Or KYOTE **NOTES:** By meeting the College Ready Academic definition, the student does not have to take the additional tests of ASVAB or WorkKeys for the bonus area. (For accountability purposes, the bonus shall not allow the readiness percentage to exceed 100 percent.)	KOSSA Or Industry Certification

Figure 2.1. CCR Model (Floyd & Hargis, 2012, 2013a, 2013b; Kentucky Dept of Ed, 2012.

The Kentucky Office of Career and Technical Education (2014) identifies CTE's purpose as an essential component of the high school curriculum, with a mission "to assist schools in providing students with skills necessary for a

successful transition to postsecondary education or work and a desire for life-long learning in a global society" (p. 1). Figure 2.1 is the model used by all Kentucky school districts in measuring College and Career Readiness as part of the state's most recent accountability guidelines.

Figure 2.1 illustrates that high schools can earn the maximum point value of one and one half points for each student who earns college *and* career readiness status. Students are considered to be both college *and* career ready if they have met the college readiness requirements *and* have met the technical component of career readiness by earning either a KOSSA or industry-recognized career certificate in their career pathway.

As also illustrated in Figure 2.1, students are considered to be college ready if they meet the Council on Postsecondary Education (CPE) system-wide benchmarks in English, Mathematics, and Reading. Students take the ACT as an 11th grader and may take the COMPASS or KYOTE college placement tests in the 12th grade in any area they fail to meet benchmark on the ACT. If they are able to meet benchmark on any of the three college placement tests in the three academic areas, the student is considered to be college ready. Students who do not meet the college readiness benchmarks are considered career ready if they have completed three or more career and technical education courses in a career pathway, met the requirements of the career-ready academic assessments of a 50 on the ASVAB or receive a silver or better WorkKeys® certificate. This must be accomplished in addition to the technical requirements for KOSSA or an industry

certificate. High schools will receive one point for each student who earns either the college *or* career ready status.

WorkKeys

Economic conditions and a shortage of skilled labor have caused many states to seek opportunities to endorse workers ability levels as sought by employers (Bivins, 2010, Dubois & Westerman, 2007, Stone, Alfeld, & Pearson, 2008). Many states are utilizing the WorkKeys test as the assessment tool used to provide this valuable information to employers about a worker's ability to perform on the job.

Gordon, Yocke, Maldonado, and Saddler (2007) promote the ACT WorkKeys test as a valuable resource being used by many secondary and postsecondary institutions to prepare students for college and a career. The test measures real-world skills as identified by employers as being critical to job success. (ACT, 2013; Gordon, et al., 2007). High schools, colleges, professional associations, companies, workforce development programs, and government agencies use the test to select, hire, develop, train and retain select, and retain a high-performance labor force for any skilled or professional occupation.

Kentucky pioneered one of the first WorkKeys based work-ready certificates in 2003 with the Kentucky Employability Certificate (KEC) ("Kentucky Serves," 2011). In an effort to address the state's employment needs, leaders from Kentucky's Department for Workforce Investment (DWI) replaced the KEC with the National Career Readiness Certificate (NCRC) program. In ACT's Spring 2011 publication of Activity, Bill Monterosso, executive director of

the Kentucky Office of Employment and Training (OET) refers to WorkKeys as "the key element in making sure we are meeting the state's employment needs, preparing a skilled workforce, and providing a credential that reaches beyond our borders" ("Kentucky Serves," 2011, p. 1).

As reported on The ACT website (2013) the NCRC and is now recognized as the most successful tactic used as a predictor of workplace success. With its introduction in 2006, 10 states were issuing credentials. Today, more than 40 states have statewide or regional certificate programs. The system is based on WorkKeys tests for Reading for Information, Applied Mathematics, and Locating Information assessments (Transforming Education, 2011). Illinois, North Carolina, Virginia, and Kentucky school systems recognize the value of these work-ready skills and are using the results to promote students with this valuable tool as an academic measure of achievement (ACT, 2013).

> For many of those [Virginia] recipients, the CRC award represents the first such certification of 'academic' achievement. Participants take WorkKeys exams in foundational job skills that are crucial to training and employment. The CRC provides employers with a valid, reliable, and legally compliant skills-assessment to integrate into the hiring process. (Dubois & Westerman, 2007, p. 535)

In the past few years, thousands of high school students have been tested with WorkKeys (ACT, 2013). Ananda (2002) reported that Michigan's Department of Career Development has proposed using WorkKeys throughout the

state as a measure of general workplace skills for secondary-level students and was included as part of a pilot study in Michigan. Similarly, Oregon and Illinois also have incorporated part of the WorkKeys battery in state-mandated testing.

Together, the CRC and the Skills Bank provide a framework for unified, consistent workforce development, education, and training across delivery systems—as well as funding streams. The CRC provides a workplace skills certification that businesses can connect directly to productivity, quality, business processes, and profitability (Dubois & Westerman, 2007, p. 535).

There are many benefits to using the WorkKeys system for assessment of high school students' proficiency on workplace readiness and employability skills as reported in a study by Ananda (2002). "Most significantly, WorkKeys is a standardized assessment package that is based on extensive research. Thus, it is appropriate for use in a range of educational settings and has empirical, psychometric data to justify its use. . . few, if any, other assessment packages for workplace readiness skills are as comprehensive and well-researched as WorkKeys (p. 4).

The results from both the ACT and WorkKeys tests are reported and used to meet state testing and reporting requirements for the college and career readiness portion of Kentucky's Unbridled Learning Accountability model and federal testing and reporting requirements of the No Child Left Behind Act (NCLB) (Kentucky Dept of Ed, 2012. These tests are being rewritten as part of Kentucky's new accountability system being launched during 2012 school year (Transforming Education, 2011).

Combining measures of cognitive skills with measures of work-related behaviors—or soft skills—brings even greater accuracy to predictions about an individual's success at work or in training. In addition to the cognitive skills measured by the NCRC, the NCRC Plus ranks individuals in four soft skills categories. These foundational skills certified by the NCRC are recognized by thousands of employers as essential for workplace success and career advancement. (ACT, 2011c).

Though WorkKeys offers an array of nine separate tests, test takers receive a certificate based on their performance in three core areas: locating information, reading for information, and applied math. (Bivins, 2010; Dubois & Westerman, 2007; ACT, 2013). Based upon ACT job profiles, students can receive four different levels of certificates. Platinum is the highest certificate given. Individuals receiving this level have the skill set required for 99% of jobs. Gold level qualifies individuals for 90%, silver is 65%, and a bronze level certificate indicates the individual is ready for 35% of all jobs profiled. "With CRC in hand, workers have a credible and portable seal of workplace readiness that gives them an advantage in regional and national employment markets" (Bivins, 2010, p. 17). Kentucky students receiving a silver, gold or platinum certificate meet the academic component of career readiness (Kentucky Dept of Ed, 2011d).

ASVAB

The Armed Services Vocational Aptitude Battery is the most widely used multiple aptitude battery in the United States (Douglas, 1986). It is used as the

qualification test for the armed service, with various forms being used in secondary and post-secondary schools since 1968. The test for schools measures aptitude in three academic areas of verbal, math, and academic ability. It also measures occupational areas of mechanical and crafts, business and clerical, electronics and electrical, health, social and technical. However, many students and high school counselors viewed the test as a tool used to predict the potential of students in the occupational areas and not a predictor of academic potential. Kentucky's accountability model uses the test as one of the measures for the academic component of career readiness.

According to Douglas (1986), in 1974, Harris and Huckell conducted probably the first ASVAB study in predicting academic success for high school students. The analysis used 22 high schools in San Antonio, Texas, and included a sample of 911 juniors and seniors. "The General Technical (GT) scores of the subjects were found to significantly relate to overall academic performance in 19 out of 22 cases" (p. 25). In 1975, Bowers, et al., used a sample of 6,130 high school students from 25 high schools offering vocational-technical training and reported the ASVAB was a valid test for numerous vocational-technical areas. In 1978, Mathews, et al., findings reported a .79 correlation of the General Technical composite of the ASVAB with the average of the reading grade levels of 2,432 subjects on the Gates-MacGinitie Reading Test and 818 of the same subjects on the Nelson-Denny Reading Test. In a 1984 study by Hunter, the validity of the ASVAB was reported to be a better measure of cognitive ability than most civilian tests of comparable structure. Gordon, 1986, reported on the findings of a

correlational study between the academic composites of the ASVAB and the math and verbal sections of the PSAT, SAT, and ACT utilizing data from the National Longitudinal Surveys. Findings indicated there was a positive relations between the academic composites of ASVAB and the math and verbal sections of the PSAT, SAT and ACT. The significance of this study was reported to support the increased use of ASVAB results to high school counselors in advising all students including those that are college bound and also for use by the college counselors in making decisions for selection and placement.

Industry Certification

Industry certification is the capstone for high school CTE students in the completion of a career pathway (Kentucky Dept of Ed, 2013b). Career and technical education programs in Kentucky offer a variety of national industry certifications for secondary students to assist them in meeting the technical component of career readiness as illustrated in Table 3.4. These are updated each year by the Kentucky Department of Education, Office of Career and Technical Education, after requests from schools are reviewed and considered (Career and Technical Ed, 2014). These certificates assure industry that the job seeker has the skills required.

KOSSA

Preparatory students in CTE also have the opportunity to take the Kentucky Occupational Skill Standards and Assessments for career readiness documentation for school accountability and may be given in lieu of an industry

certification as part of the technical requirement (KOSSA, 2013). Standards endorsed by Kentucky employers were used by educators and employers in the development of the assessment. The KOSSA is standards driven emphasizing occupational, employability, and academic competencies. Students are allocated two hours to complete the assessment, one hour for each portion of the test. Additional time may be granted upon student request.

During the 2013 school year the assessment was comprised of two parts, a multiple-choice portion and a problem-based scenario (KOSSA, 2013). Student bubbled answer sheets are used to score the multiple-choice portion of the test. Prior to 2014, the scenario portion requires students to develop a one- to two-page written response to one of two open-ended questions presented as part of the assessment. The KOSSA scenario portion for Administrative Support Services was performance-based requiring students to complete tasks using computer software. Employers and educators are used in the scoring of the scenarios. The manufacturing scenario is a multiple-choice format which is the same used for all scenarios beginning 2014 with mandatory online testing also being required for future testing. The written scenario portion of the test was eliminated during the 2013-2014 school year.

Rural Schools

> Given that young people are now rural America's most precious declining resource, it seems that the best way to preserve the nation's small towns will be to create new sorts of conservation efforts to invest more efficiently in these young people, whose

> futures—as parents, workers homeowners, voters, and taxpayers—will be so critical to the countryside's survival. (Carr & Kefalas, 2009, p. 9)

"Rural communities play a vital role in the success—or failure—of their local high schools" (Alliance, 2010, p. 5). Expectations to meet federal and state accountability standards to improve and expand student opportunities are the same for rural, urban, and suburban areas. Yet much of the federal debate over high school reform in previous years did not involve rural schools even though one in four students does not graduate from them. Students from rural areas find it difficult to attend post-secondary institutions due to expense and transportation issues thus limiting their opportunities (Alliance, 2010). Even if transportation is available, many times the nearest colleges are private institutions with much higher tuition rates than those of state colleges and universities.

Education is considered to be the great "equalizer" providing career opportunities that lead to a better lifestyle (Hoffman, Vargas, Venezia, & Miller, 2007). High schools are being held accountable to fulfill this mission for 21st century students. Historically, rural high schools have struggled to prepare minority, first-generation, low-income students (Hagen, 2010) like those from the Appalachia region, one of the poorest regions in the United States (Good Works, 2012). Families of these students typically have low education attainment due to lack of funding and remote locations with a limited tax base and lack of industry. National college attendance rates for rural areas averaged 27% from 2004 to 2009.

Schools have a social responsibility to the public with earlier school reform augmenting the connection of rural education and the experiences of rural life, using special programs to maintain youth in rural areas (Schafft & Jackson, 2010). As far back as the late nineteenth century, "education has been a primary point of policy intervention for addressing the needs of rural people and communities, both of which, more often than not, were seen as backward and deficient within a rapidly changing and urban-oriented society" (p. 275). As schools focus on national tests over local workplace skills there may be conflicts with community beliefs as school personnel work to address national and state accountability issues. Rural schools are preparing students for careers and lives that are very different from where they live, and the lives of their parents (Carr & Kefalas, 2009; Irvin, Byun, Meece, Farmer, & Hutchins, 2012).

Rural schools serve large numbers of lesser socioeconomic status students, minority students, and many single-parent families with little education (Flora, Flora & Fey, 2003). In 2007, rural school districts were responsible for more than 10 million of the nation's students and accounted for more than 50% of all public schools districts in the United States (Johnson & Strange, 2007; Provasnik, et al., 2007). Students of these schools are at risk for low motivation and lack of school success (D'Amico, Matthes, Sankar, Merchant, & Zurita, 1996) yet few studies have been conducted (Gándara, Gutièrrez & O'Hara, 2001). More than 30% of schools in the United States are in rural communities yet less than 6% of research has been conducted (Hardré, 2008).

In the 21st century education and training can guarantee upward mobility creating great loss of human capital in rural areas (Carr & Kefalas, 2009). Many residents of the small towns and rural communities are leaving causing states to fall victim to the "hallowing out" (Carr & Kefalas, 2009, p. 1) consequence. If the more educated youth of rural areas move away it could mean "the end of small-town America" (Carr & Kefalas, 2009, p. 2) leaving fewer workers to act as consumers and tax payers.

The lack of education within Appalachia resulted in turning away new industries to the region (Hargis, 2010). Geographic seclusion can combine with social and cultural norms to limit educational objectives (Carr & Kefalas, 2009; Irvin et al., 2012). Most liberal reformers of the 1960s assumed that the poor lacked only the skills and behaviors necessary to succeed in modern society (Eller, 2008). A change in behavior and programs for job training was believed to be the answer for rural Kentucky in lieu of the reallocation of capital or governmental reform.

Rural youth wanting to pursue a college degree may need to move due to inaccessibility to a postsecondary institution (Carr & Kefalas, 2009; Irvin et al., 2012). Yet, strong preferences to stay close to family and the supportive ties can make moving traumatic. Rural students may lower their educational aspirations and pursue more limited educational opportunities in order to maintain these connections thus creating additional educational barriers.

Persistently Low Achieving Schools

Schools labeled persistently low achieving in Kentucky can undergo immediate removal of administration and diminished powers of the School Based Decision Making (SBDM) Council (Kentucky Dept of Ed, 2011a). Identification for two tiers of low achieving schools is provided for in federal guidelines. Kentucky's Revised Statute 160.346 defines PLA schools as having a 60% or lower graduation rate for 3 or more years. PLA status is also given to Title I schools falling in the bottom five percent of those that fail to meet adequate yearly progress (AYP) under NCLB for three consecutive years. This is determined by averaging the percentage of each school's students who score proficient or higher in reading and math based upon annual state assessments. Non-title I schools, grades 7-12 with a 35% poverty rate that fail to meet AYP for three consecutive years can also be labeled PLA.

In January 2010, HB 176 was passed by the Kentucky General Assembly and signed into law by Governor Steve Beshear (KDE, 2011). In the spring of 2010, the Kentucky Board of Education identified the first PLA cohort consistent with state requirements and federal guidelines as outlined in KRS 160.346 and amended by House Bill 176 (HB 176). The statute also lists the processes and options for improvement relating to these schools. The second cohort was announced in the fall of 2010. These schools received school improvement grants (SIG) to provide assistance in achieving annual yearly progress (AYP). In October 2011, 19 additional Kentucky public middle and high schools were

identified by KDE as “persistently low-achieving”, based on criteria in KRS 160.346.

KDE monitors the school’s progress through quarterly reports submitted by the school (KDE, 2011). During this time, an education recovery team is assigned by KDE to the school for three consecutive years and is responsible for supporting the deployment of the turnaround model required for adoption by the school. Each PLA school is required to revise goals in the Continuous School Improvement Plan (CSIP) and Continuous District Improvement Plan (CDIP) with a goal addressing student improvement specifically for the area causing the low achievement (Kentucky Dept of Ed, 2012). The overall goal of the program is to enable those schools to make AYP and exit improvement status.

Adequate yearly progress was the measure used under No Child Left Behind to determine whether schools were meeting academic standards (Konz, 2013). Schools not making AYP are subject to consequences such as allowing students to transfer to better-performing schools or school overhauls. AYP is no longer used in the new model, instead, each school and district has an “annual measurable objective” (AMO) and are measured in part on whether they meet that goal.

As reported in the August 14 minutes of the Education Assessment and Accountability Review Subcommittee (2012), the labels used to identify schools are reward, priority, and focus. The reward schools label is given to high performing schools and schools of distinction. PLA schools are now identified as priority schools and schools underperforming in closing achievement gaps are

focus schools. Progressing schools are required to improve overall scores each year, which started in 2013. The AMO is the improvement goal. "If a school meets its AMO, it will be labeled as Progressing, indicating that it is moving in the right direction" (Education Assessment, 2012, p. 1).

"Student engagement in school consistently distinguishes high-performing and low-performing schools" (Pittman, 2010, p. 11). Since the late 1980s, career and technical education has been shown to teach contextualized learning (Cohen & Besharov, 2002, 2004; Transforming Education, 2011) in a practical situation giving real meaning to abstract theory resulting in improved student learning of academics (Stern, Frinkelstein, Stone, Latting, & Dornsife, 1995), thus increasing school engagement by keeping learning relevant (Meeder, 2008) and resulting in the successful completion of high school (Cohen & Besharov, 2002, 2004; Castellano, et al., 2004).

A top priority of President Obama's education agenda is the improvement of the lowest performing public schools in poverty stricken areas allocating Title I funding as part of the competitive grant process of Race to the Top (US Dept of Ed, 2010). Numerous research studies indicate a relationship exists between low socio-economic status (SES) and low academic achievement (Bradley & Corwyn, 2002). The SES of a school population is determined by the percentage of students that qualify for free or reduced lunch. Lack of exposure to engaging resources and experiences were identified as contributing factors affecting the future academic achievement for students of low socio-economic status.

CHAPTER 3: METHODOLOGY

This study, influenced by a lack of research on the state's newest accountability system, looks at the statistical role of career and technical education in determining the success of a high school. This chapter is organized to reveal the purpose, data analysis, sources and collection procedures, research sample, variables and measures, benefits, limitations, research question and hypotheses, trustworthiness and subjectivity, and summary.

Literature is lacking in research examining the effects and impact of Kentucky's career and technical education programs on college and career readiness. This is a new age for education reform for the Commonwealth placing CTE directors at the same table as other educational leaders in Kentucky. This study helps support the importance of both academic and technical leaders working together to help meet college and career readiness and provide additional literature to support Kentucky Senate Bill 1 (2009) and the state's CCR portion of the Unbridled Learning accountability model.

The purpose of this study is to provide a case study on how the CCR portion of the model impacted the 2013 accountability results of a persistently low achieving high school in rural Kentucky. ABC High School served as the pseudonym for the high school used for the study. The study also helps fill the gap in literature for career and technical education and college and career readiness in Kentucky. Since this represents a paradigm shift in educational accountability for Kentucky, this study may have implications for high schools and future implementation for career and technical education programs and other

PLA or priority and focus schools, as well as educational accountability and policies.

Research Question and Hypotheses

What impact do career and technical education preparatory students have on the college and career readiness accountability results for a persistently low achieving high school in rural Appalachia Kentucky?

Null: CTE preparatory students do not have a greater impact on CCR for a PLA high school located in a rural Appalachian part of Kentucky than non-preparatory students.

Alternative: CTE preparatory students have a greater impact on CCR for a PLA high school located in a rural Appalachian part of Kentucky than non-preparatory students.

Data Analysis

The study investigated the impact CTE preparatory students had on the college and career readiness accountability results for ABC High School. The school was identified as a persistently low achieving high school in rural Kentucky. The CCR spreadsheet data for the 2012 and 2013 senior classes was used for the findings.

Analysis of the data included the computation of descriptive statistics to provide an overview of the sample used in the present study. Descriptive statistics were provided on the contribution of college and career readiness scores. The

Statistical Package for Social Sciences (SPSS) was used to analyze the data using frequencies and t-test for Independent Samples with significance interpreted at the $\alpha = .05$ level for all analyses.

Statistical analysis was performed for each of the 2012 and 2013 seniors using SPSS based on the independent variables for gender representing "Male"=0 and "Female"=1 and CTE classification representing "None /Exploratory"=0 and "Preparatory"=1. The dependent variable for this study were the CCR score using the college readiness academic results for ACT English, ACT Math, ACT Reading, COMPASS English, COMPASS Math, COMPASS Reading, and KYOTE Math; academic career readiness results of WorkKeys and ASVAB; and technical career readiness results for KOSSA and Industry Certification.

Data Sources and Collection Procedures

The study used two existing data sets for college and career readiness results for the 2012 and 2013 school year retrieved from ABC High School. The 2012 data were verified and made available to the public during October 2012. The 2013 results were published for public review in October 2013. No human subjects were used in this study and SPSS 20 was utilized to analyze data.

Research Design and Analysis

This study utilized a quantitative research design. Data reported to the state was collected for each senior student enrolled at the high school during both 2012 and 2013 school years. The spreadsheets provided by the state were used for both school years. Students were assigned a number based upon the order each

student was entered into SPSS. Gender of each student was recorded as "0" for male and "1" for female. Preparatory students were designated as "Y" under "CTE Student" if they had completed a minimum of three CTE courses in one pathway. Students meeting or exceeding benchmarks on all ACT tests for English, Math, and Reading were represented as "Met the ACT". College Readiness was recorded as "Met College Placement" for students needing the results from COMPASS or KYOTE to meet the academic requirements for English, Math or Reading. "Met Career Bonus" was used to record preparatory students who were college ready and achieved the technical component for career readiness. Career Readiness was represented as "Met Career Measure" for preparatory students who were not college ready. Each of these variables was recorded as "0" for "N" and "1" for "Y". "KOSSA (Pass/Fail)" was recorded as "0" for "Fail" and "1" for "Pass". Actual scores for "ASVAB" and "WorkKeys" were used as were titles for "Industry Certificate". "KOSSA Test" and "Industry Certificate" variables were used to determine actual programs/pathways enrollment.

The WorkKeys test was administered to eligible high school seniors enrolled in Kentucky. In 2012 and 2013, the test was provided through a grant from Kentucky's Department for Workforce Investment for all seniors enrolled at all ATCs in the state. High schools also administered the test to eligible seniors. Certificate results from the test were entered for each senior student and identified as "0" for no certificate, "1" bronze, "2" silver, "3" gold, and "4" platinum.

Preparatory students took KOSSA and/or Industry Certification assessment respective to their CTE program areas. The study assumes high school seniors labeled preparatory possess adequate skill sets necessary for success on KOSSA and/or Industry Certification assessments identified for career readiness as well as the respective occupational fields of study.

During this phase the null hypothesis stated in the methodology portion of the paper was rejected. An analysis of career and technical education programs and their ability to help students meet new accountability measures for college and career readiness for district reporting for a PLA high school was reported. Analysis of student success on tests used to measure college and career readiness was evaluated. Analysis between the number of preparatory and non-preparatory students demonstrated program enrollment was not being used effectively to meet the needs of the local high school in meeting CCR.

Research Sample

Students enrolled in a rural high school in 2012 and 2013 were selected to test the hypotheses. This was a sample of convenience and was assigned the pseudonym of ABC High School. The school was selected because it was identified as a persistently low achieving high school (now identified as a priority school) for 2012 and 2013 school years used for this study.

Participants

The senior class for 2012 (n= 231) and 2013 (n = 283) served as the participants. Data for the participants were retrieved from college and career

readiness spreadsheets received from an administrator serving the high school being studied. Table 3.1 outlines specific school level data taken from the 2012 spreadsheet as related to student gender identifying 55% (n=127) females and 45% (n=104) males representing the senior class being studied.

Table 3.1

2012 School Level Data derived from CCR Spreadsheet for ABC School

Gender	Enrollment	Percent
Males	104	45.0
Females	127	55.0
TOTAL	231	100.0

Table 3.2 identifies 51.9% (n=147) females and 48.1% (n=136) males represented the 2013 senior class.

Table 3.2

2013 School Level Data derived from CCR Spreadsheet for ABC School

Gender	Enrollment	Percent
Males	136	48.1
Females	147	51.9
TOTAL	283	100.0

High School Demographics

In October 2011, 19 Kentucky public middle and high schools were identified by KDE as "persistently low-achieving", based on criteria in KRS 160.346. One of these 19 schools is the subject of this study. Accountability results for 2013 shows the high school raised its accountability performance from "Needs Improvement" in 2012 with an overall score of 57.6 to a "Proficient" score of 61.7 for 2013, and is now referred to as a "Priority School" (Kentucky School Report Card, 2013) since KDE no longer uses the PLA label for schools (Education Assessment and Accountability Review Subcommittee, 2012). The labels now used to identify schools are reward, priority, and focus. Priority schools are those schools currently listed as persistently low-achieving schools.

KDE monitors the school's progress through quarterly reports submitted by the school (Kentucky Dept of Ed, 2011a). After being identified as PLA, an education recovery team was assigned by KDE to the school for three consecutive years. The team is responsible for supporting the deployment of the turnaround model required for adoption by the school. The high school is required to revise goals in its Continuous School Improvement Plan (CSIP) as well as the Continuous District Improvement Plan (CDIP) with a goal addressing student improvement specifically for the area causing the low achievement (Kentucky Dept of Ed, 2012).

The high school involved in the study serves students in grades 9 through 12 (Kentucky School Report Card, 2013). The student enrollment for the 2012 –

2013 school year was 1,054 representing grade 9 (N = 345), grade 10 (N = 264), grade 11 (N = 224), grade 12 (N = 221). Males represent 54.6% (n=(n=575) of the total student population in the high school, while females represent 45.4% (n=479). The population for the school as represented by race was White (Not Hispanic) 92.4% (n=974), African American was 2% (n=21), Hispanic was 1.8% (n=19), Asian was 0.1% (n=1), American Indian or Alaska Native was 0.1% (n=1), Native Hawaiian or Other Pacific Islander was 0.2% (n=2), and two or more races was 3.4% (n=36). The number of students receiving free and reduced lunch was 65.6% (n=692).

Students at the school have access to numerous CTE pathways from which they may choose. These include career and technical education programs offered at ABC High School and two area technology centers. ATC's included in the population are under direct control of KDE's Office of Career and Technical Education (Kentucky Office, 2014). Kentucky's career and technical education programs provide training in 36 program areas within 9 of 16 career cluster areas. These nine career clusters are agriculture, business and marketing, communications, construction, health and human services, transportation, public safety, security, and manufacturing. Table 3.3 illustrates there were 14 career and technical education programs/pathways offered to students enrolled at ABC High School noting that the high school and one ATC offered 5 each and the second ATC offered 4 with Pre-nursing/Health Science being the only area that was duplicated.

Table 3.3

CTE Program Offerings available to ABC students

	Programs	1 High School	2 ATC	3 ATC
1	Agriculture	X		
2	Automotive Technology			X
3	Business	X		
4	Carpentry			X
5	Culinary & Food Services	X		
6	Early Childhood Education	X		
7	Electrical Technology			X
8	Industrial Maintenance		X	
9	Information Technology		X	
10	PLTW Pre-engineering	X		
11	Pre-Nursing/Health Science		X	X
12	Machine Tool		X	
13	Welding			X
14	Wood Manufacturing		X	

County Demographics

According to ThinkKentucky.com (2013), the county where the high school is located has no railway access, is 23 minutes to the nearest interstate or parkway and 55 minutes to the nearest airport. In 2012, there were 9,793 households in the county with 2.5 persons per household yielding a population of

24,461. The population reported by selected age groups revealed 21.4% of the population was under 16, 10.6% was 16 to 24, 24.7% was 25 to 44, 27.4% was 45 to 64, 14.8% was 65 to 84, and 1.1% was 85 or older with the median age being 40.3 years. Population projections for the county for 2015 are 25,509 and 26,170 for 2020. The percentage of population reported for 2012 was broken down into seven categories for race and Hispanic origin; White 95.5%, Black 2.4%, American Indian and Alaska Native 0.2%, Asian 0.2%, Native Hawaiian & other Pacific Islander 0.0%, other/Multi-race 1.3%, and Hispanic Origin 1.5%. In 2011 the average weekly wage was $572 compared to a U.S. wage of $924. The per capita income was $25,212 with the median household income being $35,530. The median home price was $85,500 with an unemployment rate for 2012 of 10.4% compared to the US of 8.1%.

School District Demographics

The school district involved in the study served 3,859 students, kindergarten to 12th grade, as reported on the District's Report Card in October 2013 (Kentucky School Report Card, 2013). Males represented 52.5% (n=2,026) of the total student population in the district, while females represented 47.5% (1,833). Population for the district as represented by race is White (Not Hispanic) 91.7% (n=3,540), African American is 1.7% (n=66), Hispanic is 2.8% (n=108), Asian is 0.1% (n=5), American Indian or Alaska Native is 0.1% (n=3), Native Hawaiian or Other Pacific Islander 0.1% (n=3), and two or more races is 3.5% (n=134). The number of students receiving free and reduced lunch is 68.4% (n=2,639). The district improved its accountability performance from Needs

Improvement with a score of 2012 (n=2,639) to Proficient for 2013 with an overall score of 58.4.

Research Variables and Measures

The college and career readiness score was chosen as a variable because no research to date was found on the impact that preparatory students in CTE pathways have on meeting the CCR accountability measures. Data used for the study represented the first two years that Kentucky used the Unbridled Learning Accountability Model where CCR accounts for 20% of the total accountability index score for a high school. The results of the study may provide research-based conclusions specific to accountability to assist policy makers at the local, state, and national levels. The college readiness test results used for this study, ACT, COMPASS, and KYOTE, as well as the career readiness results of WorkKeys, ASVAB, KOSSA and Industry Certification were selected because they are used in Kentucky to determine college and career readiness accountability for the state.

Kentucky's Accountability Model for CCR

Previous accountability models for secondary education in Kentucky have focused on academics only. Career and technical education has had no responsibility in assisting high schools with their accountability score until a new accountability model was adopted at the start of the 2012 school year. Kentucky's waiver of NCLB in 2011 allowed for the adoption of its own model of education accountability (Kentucky Dept of Ed, 2012). "Unbridled Learning is the name given to the new era in public education in the Commonwealth of Kentucky—

designed to ensure every child reaches his/her learning potential and graduates from high school ready for college and career" (Kentucky Dept of Ed, 2012, p. 1). Kentucky's Governor, Steve Beshear, understands the need to "create a career and technical education system that is a first choice, not a last chance" (Commonwealth of Kentucky, 2012, p. 1).

The new accountability model is comprised of five components that contribute points to the overall score of a school and district (Floyd & Hargis, 2012, 2013a, 2013b; Kentucky Dept of Ed, 2012). The five components are achievement, gap, growth, college and career readiness, and graduation rate with the ultimate goal being to ensure all students are college and career ready. As a part of Unbridled Learning, college and career readiness accounts for 20% as does each of the other four components. The new standard for CCR places great emphasis on career and technical education holding administrators and teachers of these programs accountable for the academic and technical components of career readiness. The model is based upon the assumption that schools and teachers can improve students' performance by improving instruction (Holliday, 2012).

Under the new paradigm, career and technical education is solely responsible for the career readiness portion (Floyd & Hargis, 2012, 2013a, 2013b; Kentucky Dept of Ed, 2012; Kentucky Office, 2014). The new model assigns the same point value to career readiness as it does college readiness making the stakes greater than ever before for career and technical education as illustrated in Figure 3.1. Students are considered to be college ready if they meet CPE system-wide

benchmarks in English, Mathematics, and Reading. Students take the ACT as a junior and may take the COMPASS or KYOTE college placement tests in their

College Ready: Must meet benchmarks on one of the following	**Career Ready: Must meet benchmarks for one requirement in career academic area and must meet one requirement in career technical area**		**Bonus: College AND Career Ready must meet at least one from each area**	
College Ready	Career Ready **Academic**	Career Ready **Technical**	College Ready **Academic**	Career Ready **Technical**
ACT English—18 Math—19 Reading—20 Or COMPASS English-Writing Skills—74 Math—36 Reading—85 Or KYOTE Reading—20 Writing—6 Math—22 Algebra—14 Calculus—TBA	ASVAB Score of 50 or greater Or WorkKeys® Silver (4) or better in each area (Applied Math, Locating Information, Reading for Information)	KOSSA Or Industry Certification	ACT Or COMPASS, Or KYOTE **NOTES:** By meeting the College Ready Academic definition, the student does not have to take the additional tests of ASVAB or WorkKeys for the bonus area. (For accountability purposes, the bonus shall not allow the readiness percentage to exceed 100 percent.)	KOSSA Or Industry Certification

Figure 3.1. CCR Model (Floyd & Hargis, 2012, 2013a, 2013b; Kentucky Dept of Ed, 2012)

senior year in any area they fail to meet benchmark on the ACT. If they are able to meet benchmark on any of the three college placement tests in the three academic areas, the student is considered to be college ready. Preparatory students who are college ready and meet the technical component of career readiness with KOSSA or an industry certification earn an additional half point and are considered college and career ready.

Preparatory students who are not college ready are considered career ready if they meet the technical and academic components of career readiness. The academic assessments used are ASVAB and WorkKeys. This must be accomplished in addition to the technical requirements of KOSSA or an industry certificate. High schools receive one point for each student who earns either the college ready *or* career ready status and one and one-half points for students earning college and career readiness.

WorkKeys

Gordon, Yocke, Maldonado, and Saddler (2007) promote the ACT WorkKeys test as a valuable resource being used by many secondary and postsecondary institutions to prepare students for college and a career. The test measures real-world skills as identified by employers as being critical to job success. (ACT, 2013; Gordon, et al., 2007). High schools, colleges, professional associations, companies, workforce development programs, and government agencies use the test to select, hire, develop, train and retain select, and retain a high-performance labor force for any skilled or professional occupation. In ACT's Spring 2011 publication of Activity, Bill Monterosso, executive director

of the Kentucky Office of Employment and Training (OET) refers to WorkKeys as "the key element in making sure we are meeting the state's employment needs, preparing a skilled workforce, and providing a credential that reaches beyond our borders" ("Kentucky Serves," 2011, p. 1).

As reported on the ACT website (2013) the NCRC is now recognized as the most successful tactic used as a predictor of workplace success. With its introduction in 2006, ten states were issuing credentials. Today, more than 40 states have statewide or regional certificate programs. Illinois, North Carolina, Virginia, and Kentucky school systems recognize the value of these work-ready skills and are using the results to promote students with this valuable tool as an academic measure of achievement. In the past few years, thousands of high school students have been tested with WorkKeys. Ananda (2002) reported that Michigan's Department of Career Development has proposed using WorkKeys throughout the state as a measure of general workplace skills for secondary-level students and was included as part of a pilot study in Michigan. Similarly, Oregon and Illinois also have incorporated part of the WorkKeys battery in state-mandated testing.

There are many benefits to using the WorkKeys system for assessment of high school students' proficiency on workplace readiness and employability skills as reported in a study by Ananda (2002). "Most significantly, WorkKeys is a standardized assessment package that is based on extensive research. Thus, it is appropriate for use in a range of educational settings and has empirical, psychometric data to justify its use…few, if any, other assessment packages for

workplace readiness skills are as comprehensive and well-researched as WorkKeys (p. 4).

Though WorkKeys offers an array of nine separate tests, CCR accountability requires students to receive a certificate based on performance in three core areas: locating information, reading for information, and applied math. (Bivins, 2010; Dubois & Westerman, 2007; ACT, 2013). Based upon ACT job profiles, students can receive four different levels of certificates. Platinum is the highest certificate given. Individuals receiving this level have the skill set required for 99% of jobs. Gold level qualifies individuals for 90%, silver is 65%, and a bronze level certificate indicates the individual is ready for 35% of all jobs profiled. "With CRC in hand, workers have a credible and portable seal of workplace readiness that gives them an advantage in regional and national employment markets" (Bivins, 2010, p. 17). Kentucky students receiving a silver, gold or platinum certificate meet the academic component of college and career readiness (Kentucky Dept of Ed, 2012).

ASVAB

The Armed Services Vocational Aptitude Battery is used as the qualifying exam for the armed services, with various forms being used in secondary and post-secondary schools since 1968 (Douglas, 1986). It is the most widely used multiple aptitude battery in the United States. The ASVAB test for schools measures aptitude in the academic areas of verbal, math, and academic ability. It also measures occupational areas of mechanical and crafts, business and clerical, electronics and electrical, health, social and technical. Early research reported

that many students and high school counselors viewed the test as a tool used to predict the potential of students in the occupational areas and not a predictor of academic potential. Today, Kentucky's accountability model uses the test as one of the measures for the academic component of career readiness (Kentucky Dept of Ed, 2012).

According to Douglas (1986), in 1974 the General Technical composite of ASVAB correlated to the overall academic performance in 19 of 22 cases studied. A second study reported the ASVAB was a valid test for numerous vocational-technical areas. A 1978 study reported a .79 correlation of the General Technical composite of the ASVAB with the average of the reading grade levels reported on the Gates-MacGinitie Reading Test and the Nelson-Denny Reading Test. Hunter reported on the validity of the ASVAB as part of a 1984 study and found it to be a better measure of cognitive ability than most civilian tests of comparable structure. Findings from Gordon's study in 1986 indicated there was a positive relationship between the academic composites of ASVAB and the math and verbal sections of the PSAT, SAT and ACT. The significance of this study was reported to support the increased use of ASVAB results to high school counselors in advising all students including those that are college bound and also for use by the college counselors in making decisions for selection and placement.

Industry Certification

Industry certification is the capstone for high school CTE students in the completion of a career pathway (Kentucky Dept of Ed, 2013b). Career and

Table 3.4

KOSSA and Industry Certification

CTE Pathways	KOSSA	Industry Certification
Agriculture	Production Livestock, Ag Power Struct., Tech Systems, Horticulture Production Crop	Equip./Engine Training Council Two Stroke, Four Stroke
Automotive	Transportation	ASE Student Certification
Business	Adm. Support, Finance Services, Bus. Mgmt.	MOS, IC3, ASK, Adobe Certified Associate
Carpentry	Construction	NCCER-Const. Carp. (Level 1)
Culinary & Food Services	Culinary & Food Services	AAFCS ServSafe
Early Childhood Education	Early Childhood Education	CCCC, AAFCS, CDA, KY Early Care & Ed. Orient. Cert.
Electricity	Construction	NCCER, Nat. Jr. Apprenticeship
PLTW	Engineering & Tech.	Autodesk Invent. Certified User
Health Sciences Pre-Nursing	Allied Health	SRNA/MNA Certified Pharmacy Technician
Industrial Maint.	Manufacturing	NCCER
Info. Technology	Communications	CompTIA, HDI, IC3
Machine Tool	Manufacturing	NIMS, MasterCam CNC
Wood Manuf.	Manufacturing	WCA
Welding	Manufacturing	KY Dept. of Transp. (SMAW or GMAW), AWS – Sense

technical education programs in Kentucky offer a variety of national industry certifications for secondary students to assist them in meeting the technical component of career readiness as illustrated in Table 3.4. These are updated each year by the Kentucky Department of Education, Office of Career and Technical Education, after requests from schools are reviewed and considered (Career and Technical Ed, 2014). These certificates assure industry that the job seeker has the skills required.

KOSSA

Preparatory students in CTE have the opportunity to take the Kentucky Occupational Skill Standards and Assessments for career readiness. Table 3.4 illustrates the KOSSA exams available for the career pathways offered at the high school. The assessment may be given in lieu of an industry certification as part of the technical requirement. Standards endorsed by Kentucky employers were used by educators and employers in the development of the assessment (KOSSA, 2013). KOSSA is standards driven emphasizing occupational, employability, and academic competencies. Students are allocated two hours to complete the assessment.

During the 2013 school year the test was comprised of two parts, a multiple-choice portion and a problem-based scenario (KOSSA, 2013). Student bubbled answer sheets were used to score the multiple-choice portion of the test. Prior to 2014, the scenario portion required students to develop a one to two-page written response to one of two open-ended questions presented as part of the assessment.

The KOSSA scenario portion for Administrative Support Services was performance-based requiring students to complete tasks using computer software. Employers and educators are used in the scoring of the scenarios. The manufacturing scenario is a multiple-choice format which is now the same used for all scenarios as of February 2014 with mandatory online testing now being required for testing.

Benefits

Significance of this study exists in terms of limited research on how career and technical education has impacted educational accountability. This study should benefit policy makers, educational leaders, teachers, and legislators by providing data showing the impact of career and technical education on CCR. Revealing the results for a rural PLA high school may assist legislators in creating new educational mandates as well as support educational leaders in the implementation of college and career readiness, school improvement, and future professional development for persistently low achieving high schools.

Limitations

Generalizability of this study is limited since there is only one high school being considered for the study. There are also many more variables that might have affected the results that aren't being evaluated. Only preparatory students are eligible for career readiness status, thus scheduling issues will have an impact on the results since some students may not be able to take at least three courses within a CTE pathway. Since CTE courses are considered to be electives for the

high school students and many of the courses offered are through a remote ATC which requires busing and a commitment of a half day away from the home high school, access to all programs is limited. Counseling may also have limited the number of students who participated in the CTE pathways at the high school. Thus, students might not have taken advantage of CTE offerings. Of course, final limitations to consider were the quality of the CTE programs and teachers with varying effectiveness so that some programs might have had lower enrollment and lower scores.

Institutional Review Board Approval

The research proposal has received exempt status from the Institutional Review Board, Protocol Number: 14-175. All data were in the public domain and provided in a manner that maintained the confidentiality of all students whose data elements were provided. It was not necessary to obtain informed consent as no human participants were involved and the coded data did not allow for identification of individuals.

Trustworthiness & Subjectivity

The "researcher is aware of and sensitive to the way his or her own history shapes a study" (Lichtman, 2010, p. 122). The researcher has been employed in career and technical education as a teacher and administrator at the secondary and post-secondary levels. The researcher also taught evening courses as an adjunct faculty for computer programming and applications at the post-secondary level.

This study is of particular importance to the researcher since she still uses what was learned from many of the vocational courses she took while in high school and college. She attributes much of her success and career choices to the business and computer courses she took at the secondary and post-secondary levels. Serving as a principal and regional administrator for the Office of Career and Technical Education, provided the researcher opportunities to work with high schools served by Area Technology Centers. The researcher believes that prior to CCR being a part of the accountability model, the perception was that many ATCs were used as a second choice for academically inclined students because the focus of school accountability was on academics and not on career training. Now that Kentucky has implemented college and career readiness as 20% of its new high school accountability model, it appears there is greater interest in CTE from high school and local district administrators and counselors.

Serving in a regional capacity for OCTE, provided the opportunity to work with local CTE programs and schools as well as many of the 53 ATCs across Kentucky. During this time, the researcher witnessed many CTE initiatives personally viewed as progressive, which appeared to set some centers apart from others. Many principals felt more academically inclined high school students weren't given the opportunity to participate in CTE programs because they were on the academic track, thus not having any extra credits to devote to career courses and training. Serving ATCs allowed for personal conversations with students who were in the top 10% of their class. These students reported that

their counselor had advised them not to take career courses because they were going to college.

It appears that college and career readiness has had a great impact on students being afforded the opportunity to participate in workplace training. District administrators appear to be much more receptive to these programs than in the past. Therefore, the researcher was interested in conducting this research to determine what impact CTE has had on college and career readiness.

Considering the researcher's position and job function, it is understood that personal subjectivity may have been present during the duration of this study. The researcher is a product of college and career readiness programming. Having the opportunity to work in the area of CTE, personal opinion is that it is of great value to all students incorporating both academic and technical course work and the researcher acknowledges the possibility of bias.

Summary

This chapter outlined the research design and methodology, including data selection and analysis, limitations, and confidentiality. The data were provided in electronic format by an administrator serving the high school being studied. SPSS was used to analyze the data using frequencies and t-test for Independent Samples with significance interpreted at $\alpha = .05$ for all analyses, and was used to answer the research question. The independent variable used was CTE classification. The dependent variables for this study were the results used to determine the college and career readiness results for each student at the high school.

CHAPTER 4: RESULTS AND FINDINGS

The primary objective of the study was to determine if preparatory students in career and technical education had a significantly greater statistical effect on the college and career readiness accountability results for a persistently low achieving high school in rural Appalachia Kentucky as compared to non-preparatory students at the same school. Specifically, the study assessed the impact of the students' results on academic and technical assessments required by the state's accountability model for college and career readiness as were reported for the 2012 and 2013 school years. Results of 12th grade students were used since requirements from the state only allow for this group to be reported for CCR high school accountability. The study included a quantitative analysis to determine whether preparatory students, those who completed three or more credits in CTE pathway, had an impact on the CCR index score for ABC High School. Descriptive and inferential statistics were utilized to determine the results. This chapter includes details for the initial data and the results of the study.

Guiding Question

One overarching question was developed to guide the study explored through quantitative methods to search for frequencies and statistical differences. What impact do career and technical education preparatory students have on the college and career readiness accountability results for a persistently low achieving high school in rural Appalachia Kentucky?

Unit of Study

The unit of study is the population of senior students who graduated in May 2012 and those students graduating in May 2013 from ABC High School. The 2012 and 2013 school years were selected because these were the first two years the school was identified as a persistently low achieving school, and were the first two years that Kentucky used a new model to determine the index score for college and career readiness. The senior class was selected because college and career readiness results at the secondary level are reported for all students only at the completion of their twelfth grade year. The two years will be studied separately. The spreadsheet used for the study identified each student as preparatory or non-preparatory. To protect the identity of individuals used for the study, the data delivered to the researcher did not include any student names or other personal information about the participants. Due to the way CCR is collected by the Kentucky Department of Education and reported in the spreadsheet received from the high school from the state, it is not possible to determine the pathway of all preparatory students. Therefore, this study was unable to study the effects of the individual pathways.

Preparatory Status

The senior class was broken down into two groups based upon identification as a preparatory or non-preparatory student. It is important to determine the students that are preparatory because this group contains the only students who can become career ready. Career ready students can affect the high school's CCR results in one of two ways. If they are college and career ready,

they earn one and one-half points for the school. If they are not college ready but earn career readiness status, they earn one point for the school. Students who are not preparatory can only become college ready and earn one point to add to the school's CCR score. Preparatory and non-preparatory students who do not earn college readiness or career readiness status contribute zero points to the school's index score for college and career readiness.

There were 231 students reported as seniors in 2012 at ABC High School. Students earning preparatory status was 55% (n=127) and 45% (n=104) who were not as reported in Table 4.1.

Table 4.1

2012 Preparatory Status

Preparatory	Frequency	Valid Percent
No	104	45.0
Yes	127	55.0
Total	231	100.0

.

There were 283 students reported as seniors in 2013 at ABC High School. Students earning preparatory status was 49.5% (n=140) and 50.5% (n=143) who were not as reported in Table 4.2.

.

Table 4.2

2013 Preparatory Status

Preparatory	Frequency	Valid Percent
No	143	50.5
Yes	140	49.5
Total	283	100.0

.

The data for 2012 yielded 11 different CTE program areas and pathways with preparatory students were enrolled. Results from Table 4.3 show 99 of the 127 preparatory students were reported based upon industry certifications and/or KOSSA tests taken. Allied Health (n=28) recorded the greatest enrollment. Manufacturing (n=18) and Child Development (n=10) areas were the only other programs reported as having 10 or more students enrolled. The remaining program areas reported less than 10 preparatory students. These areas were Ag Power Structural, and Technical Systems (n=1), Business Management (n=3), Communications (n=8), Construction (n=4), Culinary and Food Service (n=6), Financial Services (n=6), Horticulture (n=9), Production Livestock (n=3), and Transportation (n=1). Results also revealed there were students enrolled in more than one pathway, namely Allied Health and Financial Services (n=1) and Allied Health and Production Livestock (n=1).

Table 4.3

2012 Program Areas/Pathways Enrollment

Program Area/Pathway	Frequency	Percent
Ag Power Structural, and Technical Systems	1	1.0
Allied Health	28	28.3
Allied Health and Financial Services	1	1.0
Allied Health and Production Livestock	1	1.0
Business Management	3	3.0
Child Development	10	10.1
Communications	8	8.1
Construction	4	4.0
Culinary and Food Service	6	6.1
Financial Services	6	6.1
Horticulture	9	9.1
Manufacturing	18	18.2
Production Livestock	3	3.0
Transportation	1	1.0
Total	99	100.0

.

The data for 2013 used for the study yielded 13 different CTE program areas and pathways. Results from Table 4.4 show 117 preparatory students were reported based upon industry certifications and/or KOSSA tests taken. Again, Allied Health (n=19) had the greatest enrollment. Child Development (n=16),

Construction (n=17), Manufacturing (n=14) and Horticulture (n=12) areas also had 10 or more students enrolled. The remaining areas recorded less than 10 students; Agriculture Power Structural (n=3), Business Management (n=6), Communications (n=7), Culinary (n=9), Financial Services (n=2), Production Livestock (n=6), Technology Education (n=3) and Transportation (n=3).

Table 4.4

2013 Program Areas/Pathways Enrollment

Program Area/Pathway	Frequency	Percent
Ag Power Structural, & Tech. Systems	3	2.6
Allied Health	19	16.2
Business Management	6	5.1
Child Development	16	13.7
Communications	7	6.0
Construction	17	14.5
Culinary and Food Service	9	7.7
Financial Services	2	1.7
Horticulture	12	10.3
Manufacturing	14	12.0
Production Livestock	6	5.1
Technology Education/Pre-Engineering	3	2.6
Transportation	3	2.6
Total	117	100.0

Any student may take a career and technical education class, but only students earning three credits in a single career pathway are labeled preparatory. Students may also be preparatory in one or more pathways, but they can only count one time and earn a maximum of one and one-half points as described in Kentucky's CCR accountability model.

ACT Scores for College Readiness

In 2012, benchmarks were set for ACT English at 18, Math at 19, and Reading at 20. The mean score for students (n=223) on ACT English was 18.09. This same group had a mean for ACT Math of 17.9 and an ACT Reading mean of 19.81 as displayed in Table 4.5.

Table 4.5

2012 ACT Means for All Students

ACT Assessment	N	Minimum	Maximum	Mean	Std. Deviation
ACT English	223	7	33	18.09	5.175
ACT Math	223	8	28	17.90	3.033
ACT Reading	223	9	34	19.81	5.008

.

ACT benchmarks for 2013 were the same as the previous year. The mean for students (n=261) on ACT English was 19. The mean for ACT Math was 18.72 and ACT Reading was 20.06 as displayed in Table 4.6.

Table 4.6

2013 ACT Means for All Students

ACT Assessment	N	Minimum	Maximum	Mean	Std. Deviation
ACT English	261	8	35	19.00	6.122
ACT Math	261	13	33	18.72	3.904
ACT Reading	261	10	35	20.06	5.584

.

The mean scores for non-preparatory students (n=97) on the ACT for the 2012 school year was 19.03 for English, 18.37 for Math, and 20.63 for Reading. The mean scores for preparatory students (n=126) was 17.37 for English, 17.53 for Math, and 19.18 for Reading as displayed in Table 4.7.

Table 4.7

2012 ACT Means by Preparatory Status

Preparatory Student		ACT English	ACT Math	ACT Reading
No	Mean	19.03	18.37	20.63
	N	97	97	97
	Std. Deviation	5.376	3.447	5.409
Yes	Mean	17.37	17.53	19.18
	N	126	126	126
	Std. Deviation	4.915	2.628	4.600

.

The mean scores for non-preparatory students (n=127) on the ACT for the 2013 school year was 19.53 for English, 19.07 for Math, and 20.42 for Reading.

The mean scores for preparatory students (n=134) was 18.5 for English, 18.4 for Math, and 19.72 for Reading as displayed in Table 4.8.

Table 4.8

2013 ACT Means by Preparatory Status

Preparatory Student		ACT English	ACT Math	ACT Reading
No	Mean	19.53	19.07	20.42
	N	127	127	127
	Std. Deviation	6.687	4.299	6.062
Yes	Mean	18.5	18.4	19.72
	N	134	134	134
	Std. Deviation	5.514	3.473	5.088

.

COMPASS Scores for College Readiness

In 2012, benchmarks were set for COMPASS English-Writing at 74, Math was 36, and Reading was 85. COMPASS was only given to students who did not meet benchmarks on ACT. The mean score for students (n=37) on COMPASS English was 62.65. The mean for students (n=120) taking COMPASS Math was 33.93 and the mean for students (n=79) taking COMPASS Reading was 80.39 as displayed in Table 4.9.

Table 4.9

2012 COMPASS Means for All Students

COMPASS Assessment	N	Minimum	Maximum	Mean	Std. Deviation
English	37	1	94	62.65	22.993
Math	120	15	77	33.93	12.482
Reading	79	30	98	80.39	11.024

.

The benchmarks for COMPASS for the 2013 school year were the same as the previous year. COMPASS was only given to students who did not meet benchmarks on ACT. The mean score for students (n=94) on COMPASS English was 52. The mean for students (n=143) taking COMPASS Math was 28.49 and the mean for students (n=106) taking COMPASS Reading was 74.05 as displayed in Table 4.10.

Table 4.10

2013 COMPASS Means for All Students

COMPASS Assessment	N	Minimum	Maximum	Mean	Std. Deviation
English	94	1	99	52.00	31.625
Math	143	15	56	28.49	9.411
Reading	106	19	97	74.05	17.389

.

The mean score for 2012 non-preparatory students taking COMPASS English (n=10) was 75.1. The mean for non-preparatory students taking

COMPASS Math (n=49) was 33.53 and the mean for non-preparatory students taking COMPASS Reading (n=29) was 83.97. The mean score for preparatory students who took COMPASS English (n=27) was 58.04. The mean for preparatory students taking COMPASS Math (n=71) was 34.21 and the mean for preparatory students taking COMPASS Reading (n=50) was 78.32 as displayed in Table 4.11.

Table 4.11

2012 COMPASS Means by Preparatory Status

Preparatory Student		COMP English	COMP Math	COMP Reading
No	Mean	75.10	33.53	83.97
	N	10	49	29
Std. Deviation		15.474	12.373	8.882
Yes	Mean	58.04	34.21	78.32
	N	27	71	50
Std. Deviation		25.150	12.638	11.680

.

The 2013 mean score for non-preparatory students taking COMPASS English (n=55) was 42.15. The mean for non-preparatory students taking COMPASS Math (n=73) was 26.67 and the mean for non-preparatory students taking COMPASS Reading (n=62) was 71.27. The mean score for preparatory students who took COMPASS English (n=39) was 65.9. The mean for preparatory students taking COMPASS Math (n=70) was 30.39 and the mean for

preparatory students taking COMPASS Reading (n=44) was 77.95 as displayed in Table 4.12.

Table 4.12

2013 COMPASS Means by Preparatory Status

Preparatory Student		COMP English	COMP Math	COMP Reading
No	Mean	42.15	26.67	71.27
	N	55	73	62
	Std. Deviation	30.499	9.593	18.951
Yes	Mean	65.90	30.39	77.95
	N	39	70	44
	Std. Deviation	28.057	8.893	14.218

.

KYOTE Scores for College Readiness

Benchmarks for the 2012 school year were set for KYOTE Writing at 6, Math at 22, Algebra at 14, and Reading at 20. For the 2012 school year, Math was the only KYOTE assessment given at ABC High School. It was administered to students (n=44) who did not meet benchmarks on ACT Math or COMPASS Math. The mean score for non-preparatory students taking KYOTE Math (n=20) was 21.10. The mean score for preparatory students taking KYOTE Math (n=24) was 19.50 as displayed in Table 4.13.

Table 4.13

2012 KYOTE Means

KYOTE Math		Mean	N	Std. Deviation
Preparatory Student	No	21.10	20	3.463
	Yes	19.50	24	3.742
	Total	20.23	44	3.665

Benchmarks for KYOTE for the 2013 school year were the same as for the previous year. Math was again the only KYOTE assessment given at ABC High School and was administered to students (n=62) who did not meet benchmarks on ACT Math or COMPASS Math. The mean score for non-preparatory students taking KYOTE Math (n=21) was 17.10. The mean score for preparatory students taking KYOTE Math (n=41) was 16.63 as displayed in Table 4.14.

Table 4.14

2013 KYOTE Means

KYOTE Math		Mean	N	Std. Deviation
Preparatory Student	No	17.10	21	4.784
	Yes	16.63	41	5.161
	Total	16.79	62	5.002

.

College Readiness by Preparatory Status

During the 2012 school year, ABC High School's senior class (n=231) participated in college readiness assessments. Table 4.15 illustrates that 53.8% (n=56) of the non-preparatory group (n=104) were not college ready and therefore contributed zero points to CCR for the school. College readiness was demonstrated by 46.2% (n=48) of the non-preparatory students who added 48 points. There were 64.6% (n=82) of the preparatory students (n=127) who were not college ready and did not add to the high school's CCR index but will have an opportunity to earn 1 point each for career readiness. Of the total preparatory students, 35.4% (n=45) demonstrated college readiness adding 1 point each. These 45 students will be the only group that will have an opportunity to add additional bonus points of one-half points each to the high school's index score for CCR because they are preparatory in a CTE pathway. If all 45 are career ready, they could add 22.5 additional points.

Overall, Table 4.15 confirms 59.7% (n=138) of the senior class graduated not college ready and 40.3% (n=93) college ready. The high school earned 48 points toward its index score for CCR from non-preparatory students and 45 points from preparatory students for a total of 93 points. Only 45 of the total number of students (n=231) can earn bonus points if they were tested and passed one of the technical assessments for career readiness to become college and career ready. Preparatory students who were not college ready (n=82) can earn 1 point each if they were tested and were successful on one of the academic and technical tests used for career readiness.

Table 4.15

2012 Preparatory Student and College Readiness Crosstab

Preparatory Student		College Ready		
		No	Yes	Total
No	Count	56	48	104
	% within College Ready	53.8%	46.2%	00.0%
Yes	Count	82	45	127
	% within College Ready	64.6%	35.4%	00.0%
Total	Count	138	93	231
	% within College Ready	59.7%	40.3%	00.0%

.

During the 2013 school year, ABC High School's senior class (n=283) participated in college readiness assessments. Table 4.16 illustrates that 50.3% (n=76) of the non-preparatory group (n=143) were not college ready and contributed zero points to CCR for the school. College readiness was demonstrated by 50.8% (n=67) of the non-preparatory students adding 67 points. There were 49.7% (n=75) of the preparatory students who were not college ready but will have an opportunity to earn 1 point each for career readiness. Of the 140 preparatory students 49.2% (n=65) demonstrated college readiness adding 1 point each. These 65 students will be the only group that will have an opportunity to add an additional bonus point of .5 each to the high school's index score for CCR because they are preparatory in a CTE pathway. If all 65 are career ready, they could add as much as 32.5 additional points.

Table 4.16

2013 Preparatory Student & College Readiness Crosstab

Preparatory Student		College Ready		
		No	Yes	Total
No	Count	76	67	143
	% within College Ready	50.3%	50.8%	50.5%
Yes	Count	75	65	140
	% within College Ready	49.7%	49.2%	49.5%
Total	Count	151	132	283
	% within College Ready	53.4%	46.6	100%

Overall, Table 4.16 confirms 53.4% (n=151) of its senior class (n=283) graduated not college ready and 46.6% (n=132) college ready. The high school earned 67 points toward its index score for CCR from non-preparatory students and 65 points from preparatory students for a total of 132 points. Only 67 of the total number of students can earn bonus points if they also passed one of the technical assessments for career readiness to become college and career ready. Preparatory students who were not college ready (n=75) can earn 1 point each if they are successful on one of the academic and technical tests used for career readiness.

Career Readiness ASVAB (Academic Component)

Table 4.15 shows 82 preparatory students who did not earn college readiness during the first year but should have had an opportunity to earn 1 point each by meeting benchmarks on one academic and technical assessment for career readiness. During that school year, ABC High School administered the ASVAB and WorkKeys as an assessment for the academic component of career readiness. Preparatory students who scored 55 or better on the ASVAB met benchmark requirements for the academic component of career readiness. Preparatory students (n=26) who took the ASVAB had a mean score of 29.35 with only 4 students meeting benchmark as displayed in Table 4.17.

Table 4.17

2012 ASVAB for All Preparatory Students

	N	Score>54	Minimum	Maximum	Mean	Std. Deviation
ASVAB	26	4	5	78	29.35	19.295

Table 4.16 illustrates 75 preparatory students did not earn college readiness during the second year but should have had an opportunity to earn 1 point each by meeting benchmarks on one academic and one technical assessment for career readiness. During that school year, ABC High School administered the ASVAB and WorkKeys as assessments for the academic component of career readiness as was in the previous year. The benchmark for ASVAB was lowered to 50 from the previous year. Preparatory students (n=88) who took the ASVAB had

a mean score of 33.65 with only 3 students meeting benchmark as displayed in Table 4.18.

Table 4.18

2013 ASVAB for All Preparatory Students

	N	Score>49	Minimum	Maximum	Mean	Std. Deviation
ASVAB	88	3	5	76	33.65	18.921

Data for 2012 preparatory students (n=21) who were not college ready and took the ASVAB had a mean score of 24.38 as displayed in Table 4.19.

Table 4.19

2012 ASVAB for Preparatory Students not College Ready

	N	Score>54	Minimum	Maximum	Mean	Std. Deviation
ASVAB	21	2	5	59	24.38	15.609

Data for 2013 preparatory students (n=58) who were not college ready and took the ASVAB had a mean score of 27.21 as displayed in Table 4.20.

Table 4.20

2013 ASVAB for Preparatory Students not College Ready

	N	Score>49	Minimum	Maximum	Mean	Std. Deviation
ASVAB	58	9	5	67	27.21	17.475

.

Career Readiness WorkKeys (Academic Component)

Required minimum benchmark for WorkKeys for 2012 was a score of four, silver level. During the school year, preparatory students including those who were already college ready took the assessment (n=54) with 37% (n=20) not meeting benchmark, 55.6% (n=30) achieving silver, and 7.4% (n=4) achieving gold as displayed in Table 4.21.

Table 4.21

2012 Preparatory Student & WorkKeys *Crosstab*

WorkKeys Certificate		Bronze or less (<4)	Silver	Gold	Total
Yes	Count	20	30	4	54
	% within Preparatory Student	37.0%	55.6%	7.4%	100%

The required minimum benchmark for the WorkKeys test for 2013 did not change from the previous year. During this school year, preparatory students including those who were already college ready took the assessment (n=83) with 25.3% (n=21) did not meet benchmark, 57.8% (n=48) achieving silver, and 16.9% (n=14) achieving gold as displayed in Table 4.22.

Table 4.22

2013 Preparatory Student & WorkKeys Crosstab

WorkKeys Certificate		Bronze or less (<4)	Silver	Gold	Total
Yes	Count	21	48	14	83
% within Preparatory Student		25.3%	57.8%	16.9%	100%

In 2012, preparatory students (n=46) who were not college ready and took the WorkKeys assessment met the academic component of career readiness with a score of four for silver (n=30) or a score of five for gold (n=2). Students who did not meet benchmark (n=14) scored a three or less as displayed in Table 4.23.

Table 4.23

2012 Preparatory Student & WorkKeys Crosstab

WorkKeys® Certificate		Bronze or less (<4)	Silver	Gold	Total
Yes	Count	14	30	2	46
% within Preparatory Student		30.4%	65.2%	4.4%	100.0%

In 2013, preparatory students (n=54) who were not college ready and took WorkKeys met the academic component of career readiness with a score of four for silver (n=30) or a score of five for gold (n=4). Students who did not meet benchmark (n=20) scored a three or less as displayed in Table 4.24.

Table 4.24

2013 Preparatory Student & WorkKeys Crosstab

WorkKeys® Certificate		Bronze or less (<4)	Silver	Gold	Total
Yes	Count	20	30	4	54
% within Preparatory Student		25.3%	57.8%	16.9%	100.0%

Data for 2012 reveals that of the preparatory students (n=20) who were not college ready only 10% (n=2) did not have an opportunity to test for the academic component of career readiness using either ASVAB or WorkKeys. Results from the 90% (n=18) who did test yielded 38.9% (n=7) passed one of the assessments and 61.1% (n=11) did not as illustrated in Table 4.25.

Table 4.25

2012 Academic Career Readiness—Preparatory Students Not College Ready

		Frequency	Percent	Valid Percent	Cumulative %
Valid	No	11	55.0	61.1	61.1
	Yes	7	35.0	38.9	100.0
	Total	18	90.0	100.0	
Missing	System	2	10.0		
	Total	20	100.0		

Table 4.26

2013 Academic Career Readiness--Preparatory Students Not College Ready

		Frequency	Percent	Valid Percent	Cumulative %
Valid	No	30	40.0	44.8	44.8
	Yes	37	49.3	55.2	100.0
	Total	67	89.3	100.0	
Missing	System	8	10.7		
	Total	75	100.0		

Data for 2013 reveals that 10.7% (n=8) of the preparatory students (n=75) who were not college ready did not test for the academic component of career readiness with ASVAB or WorkKeys. Results from the 89.3% (n=67) who did test, 55.2% (n=37) passed one of the assessments and 44.8% (n=30) did not as illustrated in Table 4.26.

Career Readiness Industry Certifications (Technical Component)

Table 4.15 reports 82 preparatory students who did not earn college readiness during the first year but should have had an opportunity to earn a point each by meeting benchmarks on an academic and technical assessment for career readiness. During that school year, ABC High School administered industry certifications and KOSSA as assessments for the technical component of career readiness.

Table 4.27

2012 Industry Certifications

Industry Certificate	Frequency	Valid Percent
Autodesk Certified User	1	2.7
Medicaid Nurse Aide (MNA)/SRNA	3	8.1
NCCER-Electrical Technology Level 1 Certification	2	5.4
NIMS-Machine Tool Level 1 Certification	6	16.2
Pharmacy Technician Certification Board (PTCB)	3	8.1
State Registered Nursing Assistant (SRNA)	22	59.5
Total	37	100.0

Table 4.27 illustrates the various industry certificates that were given to students in pathways offered through ABC High School. Preparatory students were successful in meeting industry certification for Autodesk Certified User (N = 1), Medicaid Nurse Aide (n=3), NCCER-Electrical Technology Level 1 (n=2), NIMS-Machine Tool Level 1 (n=6), Pharmacy Technician (n=3) and State Registered Nursing Assistant (n=22).

Table 4.28

2013 Industry Certifications

Industry Certificate	Frequency	Valid %
ASE Test (Professional) Electrical/Electronic System	1	2.08
ASK – Fundamental Business Concepts (#ME05)	9	18.75
Certified Solid Works Associate (CSWA)	1	2. 08
Commonwealth Child Care Credential (CCCC)	5	10.42
KY Department of Transportation Certification	1	2. 08
KY Early Care & Education Orientation Certificate	10	20.83
Microsoft Office Specialist (Word, Access, Excel, PP)	3	6.25
Pharmacy Technician Certification Board (PTCB)	1	2. 08
ServSafe	2	4.18
State Registered Nursing Assistant (SRNA)	15	31.25
Total	48	100.0

Table 4.28 illustrates the various industry certifications that were given to students in pathways offered through ABC High School. Preparatory students were successful in meeting industry certification for ASE Electrical/Electronic System (n=1); ASK – Fundamental Business Concepts (n=9); Certified Solid Works Associate (n=1); Commonwealth Child Care Credential (n=5); KY Department of Transportation Certification (n=1); KY Early Care & Education Orientation Certificate (n=10); Microsoft Office Specialist (n=3); Pharmacy

Technician Certification Board (n=1); ServSafe (n=2); and State Registered Nursing Assistant (n=22).

Career Readiness KOSSA (Technical Component)

Table 4.29 illustrates that during the 2012 school year, 58.3% (n=74) of all preparatory students (n=127) participated in KOSSA, a career readiness technical assessment while 41.7% (n=53) did not take the test. Of the group that took the test, 51.4% (n=38) met benchmark or better while 48.6% (n=36) did not.

Table 4.29

2012 Career Readiness—Technical KOSSA

KOSSA		Frequency	Percent	Valid %	Cumulative %
Valid	Passed	38	29.9	51.4	51.4
	Failed	36	28.3	48.6	100.0
	Total	74	58.3	100.0	
Missing	No KOSSA	53	41.7		
Total		127	100.0		

Table 4.30 illustrates that during the 2013 school year, 83.6% (n=117) of all preparatory students (n=140) participated in KOSSA, a career readiness technical assessment while 16.4% (n=23) did not take the test. Of the group that took the test, 41.4% (n=58) met benchmark or better while 42.1% (n=59) did not.

Table 4.30

2013 Career Readiness—Technical KOSSA

KOSSA		Frequency	Percent	Valid %	Cumulative %
Valid	Passed	58	41.4	49.6	49.6
	Failed	59	42.1	50.4	100.0
	Total	117	83.6	100.0	
Missing	No KOSSA	23	16.4		
Total		140	100.0		

Findings for Career Readiness

Table 4.31 indicates the percentage of preparatory students (n=127) that exhibited career readiness for 2012 was 31.5% (n=40) and 68.5% (n=87) did not.

Table 4.31

2012 Career Ready Students

Preparatory Career Ready Student	Frequency	Percent
No	87	68.5
Yes	40	31.5
Total	127	100.0

Table 4.32 breaks down the percentage of preparatory students (n=140) exhibiting career readiness for 2013 as 35% (n=49) and 65% (n=91) that did not.

Table 4.32

2013 Career Ready Students

Preparatory Student Career Ready	Frequency	Percent
No	91	65
Yes	49	35
Total	140	100.0

Table 4.33

2012 Academic Career Readiness all Preparatory Students

Career Ready		Frequency	Percent	Valid Percent
Valid	No	32	39.0	47.8
	Yes	35	42.7	52.2
	Total	67	81.7	100.0
Missing	System	15	18.3	
	Total	82	100.0	

Table 4.33 reveals that 42.7% (n=35) of preparatory students tested with ASVAB or WorkKeys met one or more of the academic components required for career readiness and 39.0% (n=32) did not. Findings indicate that only 81.7% (n=67) of the preparatory students were tested for the academic component of

career readiness and therefore the high school missed potential opportunities for additional points for career readiness when they did not test 18.3% (n=15) of the students that did not meet college readiness.

Table 4.34 reveals that 52.1% (n=73) of preparatory students tested with ASVAB or WorkKeys met one or more of the academic components required for career readiness and 25% (n=35) did not. Findings indicate that only 77.1% (n=108) of the preparatory students were tested for the academic component of career readiness and therefore the high school missed potential opportunities for additional points for career readiness when they did not test 22.9% (n=32) of the students that did not meet college readiness.

Table 4.34

2013 Academic Career Readiness all Preparatory Students

Career Ready		Frequency	Percent	Valid Percent
Valid	No	35	25.0	32.4
	Yes	73	52.1	67.6
	Total	108	77.1	100.0
Missing	System	32	22.9	
	Total	140	100.0	

The information and data in this study led to 231 students being reported as seniors for 2012 who participated in assessments for CCR. The group statistics yielded 104 non-preparatory and 127 preparatory students. An independent

samples t-test was performed to determine if there was a significant difference between the points earned for preparatory students and non-preparatory students at ABC High School for the 2012 school year. A mean difference of .129 was found to occur between the points earned for preparatory students (M=.591 SD=.6023) and non-preparatory students (M,=.462,SD=.5009) as displayed in Table 4.35. Results indicated no significant difference; t(229)= -1.745, p<.05, two tailed, where p=.082 as shown in Tables 4.36 and 4.37. The null was accepted.

Table 4.35

2012 Group Statistics

Group Statistics	Preparatory	N	Mean	Std. Deviation	Std. Error Mean
Points Per Students	No	104	.462	.5009	.0491
	Yes	127	.591	.6023	.0534
	Total	231			

.

Table 4.36

2012 T-Test

		Levene's Test for Equality of Variances		t-test for Equality of Means	
		F	Sig.	t	df
Points Per Student	Equal variances assumed	22.781	.000	-1.745	229
	Equal variances not assumed			-1.777	228.939

.

Table 4.37

2012 Independent Samples Test

		t-test for Equality of Means	
		Sig. (2-tailed)	Mean Difference
Points Per Student	Equal variances assumed	.082	-.1290
	Equal variances not assumed	.077	-.1290

The information and data in this study led to 283 students being reported as seniors at ABC High School for 2013 who participated in assessments for college and career readiness. The group statistics yielded 143 non-preparatory and 140 preparatory students. An independent samples t-test was performed to determine if there was a significant difference between the points earned for preparatory students and non-preparatory students at ABC High School for the 2013 school year. A mean difference of .327 was found to occur between the points earned for preparatory students (M=.796, SD=.6373) and non-preparatory students (M=.469,SD=.5008) as displayed in Table 4.38. Results indicated no significant difference; $t(281) = -4.818$, $p<.05$, two tailed, where $p=.000$ as shown in Tables 4.39 and 4.40. The null was accepted.

Table 4.38

2013 Group Statistics

Group Statistics	Preparatory	N	Mean	Std. Deviation	Std. Error Mean
Points Per Student	No	143	.469	.5008	.0419
	Yes	140	.796	.6373	.0539
	Total	283			

Table 4.39

2013 T-Test

		Levene's Test for Equality of Variances		t-test for Equality of Means	
		F	Sig.	t	df
Points Per Student	Equal variances assumed	14.223	.000	-4.818	281
	Equal variances not assumed			-4.806	263.570

.

Table 4.40

2013 Independent Samples Test

		t-test for Equality of Means	
		Sig. (2-tailed)	Mean Difference
Points Per Student	Equal variances assumed	.000	-.3279
	Equal variances not assumed	.000	-.3279

Conclusion

The information and data in this study led to 231 students being reported as seniors at ABC High School for 2012 and 283 for 2013. All students participated in assessments for college and career readiness through their high school or Area Technology Center. The group statistics yielded 104 non-preparatory and 127 preparatory students for the first year and 143 non-preparatory and 140 preparatory students participating in the second year. An independent samples t-test was performed for each year to determine if there was a significant difference between the points earned for preparatory students and non-preparatory students at ABC High School.

CHAPTER 5—DISCUSSION OF RESULTS

President Obama's reauthorization of Perkins IV mandates that states increase access to high-quality CTE opportunities particularly for students in rural or remote areas through increased use of services that would foster success and improve the quality of career and technical education programs (Duncan, 2012). RTTT also ensures that rural economic needs are considered in the creation of high-quality CTE programs delivering results to help more students become college and career ready demonstrating that CTE is poised to align with RTTT priority areas.

Most studies demonstrate that career and technical educational programs have a positive impact on college and career readiness (Hagen, 2010). The primary objective of this study was to discern the impact of preparatory students in career and technical education on the CCR index score for a rural, persistently low achieving high school. The study included a quantitative methods analysis to assess the impact of student results on academic and technical assessments required by the state's accountability model for college and career readiness as reported for the 2012 and 2013 school years. The study included a quantitative analysis to determine whether preparatory students, those who completed three or more credits in a CTE pathway, had an impact on the CCR index score for ABC High School. Descriptive and inferential statistics were utilized to determine the results.

Quantitative Research Findings

The sample for the study was derived from two spreadsheets developed by the state for the 2012 and 2013 school years. The variables used were the individual components that make up the CCR results for the school and were reported in the spreadsheet as CTE student, ACT, college placement, career measure, career bonus, ASVAB, WorkKeys Certificate, Industry Certificate, and KOSSA (Kentucky Dept of Ed, 2012). The variable gender is also used to report the number of females and males in the study. Both years resulted in Allied Health having the greatest enrollment of preparatory students.

The researcher selected the 2012 and 2013 school years because these were the first two years the school was identified as persistently low achieving and Kentucky's current model for college and career readiness was introduced to schools for the first time using data from 2012 (Kentucky Dept of Ed, 2012). The two years were studied separately. To protect the identity of individuals used for the study, the data in the spreadsheets did not include any student names or other personal identifying information about the participants. Due to the methods used to collect CCR data by the Kentucky Department of Education as recorded in the spreadsheet, it is not possible to determine the pathway of all preparatory students. Therefore, this study was unable to determine the effects of individual program areas. However, it appears the number of CTE programs and pathways represented in the data increased from the first year (n=11) to the second year (n=(n=13). The total enrollment of seniors was reported for 2012 (n=231) and 2013 (n=283). The class for each school year was broken down into two groups

based upon each student's identification as a CTE student. This resulted in the student being labeled preparatory or non-preparatory.

The assumption would be that as total enrollment and offerings increase, so would preparatory enrollment. However, data reveals the number of preparatory students decreased during the second year with 55% (n=127) of the students reported as preparatory for 2012 and only 49.5% (n=140) preparatory for the second year. It is important for schools to recognize the importance of most or all of their students to be preparatory because students with this status are the only individuals who can become college and/or career ready (Floyd & Hargis, 2012, 2013a, 2013b). Non-preparatory students can only become college ready and earn one point to add to the school's CCR score. Preparatory students who become career ready can influence the high school's CCR results in one of two ways. Students who are college and career ready add one and one-half points. Those who are not college ready but earn career readiness status add one point. Students who do not become ready in college or career contribute zero points.

Although the sample was for one school for two years and the results showed no statistical difference between preparatory and non-preparatory students, this is viewed as a positive outcome for both years. Students earning career readiness have essentially the same impact on CCR as those who do not have a concentration in CTE but career ready students leave with a validated skill as requested by business and industry. Results support the inclusion of academic and technical courses offers a distinct rationale for secondary schools requiring

students to complete a pathway of courses preparing students for college and a career (Hagen, 2010; Hargis, 2010; Kentucky Dept of Ed, 2012).

College and Career Readiness Results

CCR data for 231 students reported for 2012 revealed 28 preparatory students became college and career ready earning 1.5 points each contributing 42 points to the overall CCR score for the high school. Preparatory students (n=17) and non-preparatory students (n=48) who were only college ready earned 1 point each and contributed 65 points. Preparatory students who were not college ready earned 1 point each for being career ready and contributed 20 points. Zero points were contributed by 118 students including preparatory (n=62) and non-preparatory (n=56). Overall, the high school accumulated 127 CCR points yielding an average of .55 per student for the first year. Results indicated no significant difference in the points contributed by preparatory and non-preparatory students. The null was accepted. Results for preparatory students are promising for the school since 65 of the 127 preparatory students graduated ready for college or a career compared to only 48 of the non-preparatory students.

CCR data for 283 students reported for 2013 revealed 45 preparatory students became college and career ready earning 1.5 points each contributing 67.5 points to the overall CCR score for the high school. Preparatory students (n=20) and non-preparatory students (n=67) who were only college ready earned 1 point each and contributed 87 points. Preparatory students who were not college ready earned 1 point each for being career ready and contributed 24 points. Zero points were contributed by 127 students including preparatory (n=51) and non-

preparatory (n=76) because they were unable to meet the readiness criteria for college or career. Overall, the high school accumulated 178.5 CCR points yielding an average of .63 points per student for the second year. Results indicated no significant difference in the points contributed by preparatory and non-preparatory students. Results for 2013 are also promising since they reveal 89 of the 140 preparatory students graduated college or career ready and only 67 non-preparatory students graduated college ready.

Overall, results reflect positively on the school since a 2006 study suggests the success of secondary students in the workplace and college require the same level of academics for them to be competitive in the workplace (ACT, 2006; Boykin, Dougherty, & Lummus-Robinson, 2010; Regan, 2008; Saylor, 2008).

College Readiness Findings

ACT benchmarks for both years were set at 18 for English, 19 for Math, and 20 for Reading. Findings indicated that students improved the overall results of the school on each of the three tests both years. During the first year, there were more preparatory students (n=127) than non-preparatory students (n=104) with mean scores for preparatory students being less than 1 point in Math and Reading and less than 2 points in English. In 2013, there were fewer preparatory (n=140) than non-preparatory (n=143) students with the mean scores being less than 1 point in all three areas. Castellano, Stone, Stringfield, Farley, and Wayman (2004) conducted a longitudinal study of the effects of career and technical education on reading and math scores of students in poor communities at three

schools in the United States. The study revealed student participation in these programs yielded greater growth in both reading and math than other students.

COMPASS and KYOTE were administered to students who did not meet benchmarks on one or more of the ACT tests that generated a different number of students being tested in each area. Both years resulted in more students needing to be reassessed in math more than any other area. During the first year, there were a greater number of preparatory students being retested in all three areas, however, second year results illustrated fewer preparatory students needed to be retest in all three areas indicating the schools again addressed academics for CTE students. However, as many as 143 students, both preparatory and non-preparatory, took the COMPASS in math indicating that a greater focus should be placed in this area to improve accountability results.

Career Readiness Findings

There were 231 students reported as seniors in the first year at ABC High School with 55% (n=127) recorded as preparatory. There were 283 students reported for the second year with 49.5% (n=140) being preparatory. Only preparatory students were eligible for career readiness. Preparatory students who were not college ready had an opportunity to become career ready during both years when they were successful on the academic and technical components of career readiness. Academics were assessed with ASVAB or WorkKeys assessments. The benchmark for ASVAB was 55 for 2012 and 50 for 2013. WorkKeys benchmark was set at level three, silver certificate for both years. Success with the technical component was achieved by earning an industry

certificate or passing KOSSA. The data used for the study listed only those students earning industry certificates in their CTE pathway making it difficult to determine if any students failed to achieve this component using this method. KOSSA results were noted in the spreadsheet as pass or fail for each student taking the test. Some preparatory students were not given an opportunity to test in this areas resulting in possible points lost for the high school.

During 2012, there were 46 preparatory students not college ready who took WorkKeys to meet the academic requirement for career readiness. Findings indicate that 32 met or exceeded the benchmark with 30.4% (n=14) not meeting the benchmark. Findings for 2013 indicate that more preparatory students (n=54) who were not college ready were tested during this year with only 25.3% (n=20) not meeting benchmark.

During the first year, 82 preparatory students did not earn college readiness but were eligible for career readiness. There were 140 reported for the second year. ASVAB findings indicated that 21 of the 82 students tested with only 2 passing the assessment in 2012. During 2013, 58 preparatory students were tested with only 9 passing the assessment. Perhaps greater success was achieved in the second year because more students were tested or the benchmark was lowered from 55 to 50. However, the mean score improved from 24.38 in 2012 to 27.21 in 2013, which can be viewed as a success for the second year indicating that greater emphasis is being placed on the academic portion of career readiness.

Findings indicate that during the 2012 school year, 18 preparatory students were given the opportunity to be academically ready on the career readiness side

by testing with ASVAB or WorkKeys. KOSSA was used to test 54 students for the technical component of career readiness. Of the preparatory students who were not college ready and passed the technical component of career readiness with KOSSA there were only two students who may have been overlooked because they did not test for the academic component 8 were neglected in 2013. Having an increase in the number of students for the second year indicates that the high school should pay closer attention to preparatory students and assess each one fully for career readiness. It is not only valuable to the school, but a boost to the student's self-esteem for each credential they might earn. More credentials can improve the job opportunities as well.

Data for 2012 resulted in 37 industry certificates being earned and reported with 48 being revealed in the data for 2013. There were 82 preparatory students in the first year and 140 recorded for the second year that did not earn college readiness and were eligible for career readiness. Industry certificates were reported for 2012 (n=37) and 2013 (n=48). It is assumed that only those who were successful were reported since there was a 100% pass rate. Therefore, it is possible to conclude that the school did not extend this opportunity to all preparatory students.

Results for KOSSA indicate that 51.4% (n=38) were successful in meeting or exceeding benchmarks for 2012. However, results imply that of the 127 preparatory students in 2012, 41.7% (n=53) were not given this assessment. During the following year, 2013, the number of preparatory students increased to 140 with more students (n=117) being tested with KOSSA, but only 41.4%

(n=58) passed. Since the number of preparatory students increased for this year and fewer students (n=23) were overlooked that did not receive the opportunity to take the exam than in the previous year, it is assumed that the high school recognized the value that each student can add to the overall CCR score for the school. This also indicates that the high school improved the opportunity for earning CCR points for students and the high school.

A summation of the results for career readiness reveals that the high school missed opportunities to test students in both academic and technical components for career readiness. Resulting in possible lost points for 2012 (n=2) and 2013 (n=8) within the academic component and additional points within the technical component when students were also overlooked for 2012 (n=53) and 2013 (n=23) for KOSSA. Missing students could not be determined for industry certification since performance for this variable was only reported for those who earned the certificate. However, it is assumed that the high school could have earned additional points each year if every preparatory student had been given every opportunity for career readiness.

Limitations of the Study

Several limitations to this study are important to note. The case study was for one school designated as persistently low achieving. The study was also limited to the results of a new accountability model, which was mandated for adoption during the first year that the school was a PLA. A longitudinal study encompassing additional years and additional schools with PLA status would have increased the sample size and thus the power to find differences that exists.

Albeit, the results indicating that many students needed to take many different types of academic tests of varying kinds such as ACT, COMPASS, KYOTE, ASVAB and WorkKeys is sufficient that the study must recognize that these factors may have had a significant impact that is not fully recognized or understood but does support "that a single test score alone should not be the measure of college- and career-readiness" (Transforming Education, 2011, p. 20). Limitations might also exist due to the high school counselor's lack of information and willingness to promote CTE pathways to all students as indicated in the review of literature. A final overall limitation to the study was presented since there were no studies of this type evaluating the effects of preparatory students on accountability results for a high school with PLA status.

Despite these limitations, the findings of this study are valid and should be of assistance to administrators, researcher and legislators involved in assessing, developing and legislating accountability models for schools.

Implications for Policy

An essential component of any study is a look at whether or not certain policies or accountability models mandated as part of legislation and state departments as part of an NCLB waiver are helpful to desired student, school and district outcomes. While the study itself examines the impact of preparatory students in CTE pathways on accountability results for college and career readiness, it is important to note the importance of career and technical education in developing the future workforce enabling students to get better jobs and thus improve local economies. Thus, policy should be considered for improved

professional development and college programs for guidance counselors in advising students for careers. It is also important to note the importance of guidance offered to all students. While many schools might wish to offer additional CTE opportunities, local, state and federal funding might prohibit any growth in this area. Thus, additional policies for increased funding should be considered. Results for schools can also vary due to lack of program offerings in rural areas. A consideration for increased funding to these areas should be considered.

These decisions can only be made by each administration based upon the CTE offerings available to the students at the high school. Scheduling is also a consideration since student enrollment in CTE courses are only available based upon the number of electives students can take each year they are in high school. Current state mandates limit the number of due to the increased number of academic requirements. Given the strong support of career and technical education by business and industry and the increased attention Kentucky's new accountability model has brought to skilled education, conducting a review of polices that impact CTE would be a worthwhile undertaking to determine the need for policy changes or programming needs.

In regards to academic performance, this study examines the effect of students completing a minimum of three credits in a single career pathway with findings indicating that the students in this group have performed as well as their college-ready peers and have a technical component in addition to the academic portion. These results can be interpreted as a policy success for Kentucky's new

accountability model for college and career readiness which raises the policy question as to whether more program offerings can be easily duplicated or expanded at all high schools throughout the state. Because not all programs offered are available at all secondary institutions, duplication of the pathways at other institutions would require a sizable investment of local, state and federal funds. The mix of these criteria is most likely to occur in districts throughout the state and nation that have access to increased tax rates with higher socio-economics levels and business and industry. Adding CTE to the accountability proves "what gets measured gets done." Prior to the current accountability model, CTE got very little attention from high school administrators. Results indicate that greater attention is being placed on this area of education. Unless a program can be directly connected to accountability, it is unlikely to find support among district and school administrators. CTE pathways are now considered a necessary educational component for high schools in many states including Kentucky. With the increased emphasis on college and career readiness, funding for more programs is in greater demand requiring the need for increased funding. Examination of additional regional centers such as the area technology system offered to various districts should be a consideration to improve program offerings to rural districts and may warrant further review by state officials.

Implications for Practice

In examining implications of this study from a practice point of view for administrators, high schools should monitor closely preparatory students who are college ready and those who are not college ready to assure every opportunity for

additional points for the school. Preparatory students who are college ready should be tested to earn the technical component of career readiness with either an industry certificate or KOSSA. These students can add one-half point each if they are successful on one of these assessments. It also appears that schools might have a better chance at earning points with this group since they have already proven they can be successful at taking higher-level tests such as the ACT.

Administrators must also assure that preparatory students who are not college ready have every opportunity to test in both the academic and technical components of career readiness so they can take advantage of potential points that might be missed if these students are overlooked. This group of students can add one point each to the school's CCR score. Every point is critical to every school, but especially to PLA schools since the difference between having this label and not can be only a fraction of a point.

The only points that a non-preparatory student can contribute to the high school's CCR score is when they earn college readiness status. Employers and students in multiple studies conducted during the 1990s felt students were being turned away from career and technical education and blue-collar jobs because counselors were pushing college for everyone (Cohen & Besharov, 2002, 2004). Suggestions for future practice would be for high school guidance counselors to improve how they advise students in order to increase the opportunities for career readiness. Guidance should be provided to assist students in selecting a career pathway offered through the high school that will give them an opportunity to complete three courses in a CTE pathway to become preparatory.

It is suggested that high schools improve their reporting to the state by entering information for all industry certificate opportunities. It is assumed from the two sets of data used for this study that opportunities for industry certification were not extended to every student since only 37 were reported for 2012 and only 48 for 2013. It is assumed that only those who were successful were reported since there was a 100% success rate. Therefore, it is possible to conclude that the school could have improved their point value by offering more opportunities for industry certification. Again, this is especially important since the overall goal of the PLA program is to enable those schools exit improvement status (Kentucky Dept of Ed, 2011a). This could have made the difference between the school continuing with PLA status since even one-half point could remove them from this group.

Call for Future Research

As noted, the study was limited to data acquired from a PLA high school in rural Kentucky. Review of literature indicates career offerings are limited in rural areas. Additional research should be considered to evaluate the role that CTE programs play in economic development as recognized in a national summit on The Role of Education in Economic Development in Rural America (Bivins, 2010).

Assistance provided to PLA schools has an overall goal to enable those schools to make AYP and exit improvement status (Education Assessment, 2012). Research should be conducted to evaluate the impact of preparatory enrollment in CTE on the other components of the accountability model for a PLA. Schools

labeled persistently low achieving in Kentucky can undergo immediate removal of administration and diminished powers of the School Based Decision Making (SBDM) Council (Kentucky Dept of Ed, 2011a) thus making it even more important for additional research to be conducted.

Additional studies of the impact of preparatory students in other high schools should be a consideration. As the nation has increased the emphasis of college and career readiness for all students with the increased efforts of Race to the Top, other states should conduct future research to determine the impact of CTE on CCR. Consideration should be given to improve states' emphasis on career advising for all students with a study being conducted in other areas. The study of additional data from other institutions will allow for more accurate and current data on CTE programming and pathways and the impact these might have on the economy and placement of students. Enrollment and completion information will aid policy makers and stakeholders in making well-informed, data-driven decisions regarding CTE programming and accountability for secondary and post-secondary institutions. A better understanding of the migration of CTE students from initial enrollment to graduation to the workforce will add substantially to the body of knowledge about the impact of career programming for education.

Concerning this study, it would be beneficial to follow the study participants to post-secondary and employment to determine the overall impact of preparatory status for each group, as well as academic achievement. Likewise, extending the study to include additional groups would provide comparable data

that could further validate, expand, or contradict the conclusions of the current study. Establishing procedures for continuous tracking, assessment, and program evaluation is a best practice that should be adopted by all institutions seeking to improve their student services.

A longitudinal study should be considered to evaluate the impact Kentucky's new CCR model for accountability has had on career offerings and enrollment in CTE across the state now that career readiness has the same value as college readiness. As suggested, it would be worthwhile to conduct a study of the impact that professional development and improved certification training offered at post-secondary institutions to guidance counselors has on student enrollment in CTE. It would be an informative study to explore whether professional development for current high school counselors affects the enrollment of a higher caliber of student and the consequences of improved guidance. Research should be conducted to measure the number of students who have greater academic success in these programs and improved guidance to all students making CTE "a first choice, not a last chance" (Commonwealth of Kentucky, 2012, p. 1). This would make for interesting research from both perception and an economical point of view. While this study helps understand the impact of adding CTE to a high school's accountability, it does not adequately explain if students who have higher GPAs are being encouraged to take CTE courses. Looking beyond the impact on CCR results and examining the guidance and decision-making processes of high school students entering employment or post-secondary education would be invaluable to the body of knowledge at large.

Conclusion

Group statistics for the study yielded 104 non-preparatory and 127 preparatory students for the first year. An independent samples t-test indicated there was no significant difference in the points contributed by either group. The null was accepted. CCR data for the 231 students reported for 2012 revealed 65 preparatory students contributed a total of 79 points to the overall CCR score for the high school with non-preparatory students contributing 48. There were 143 non-preparatory and 140 preparatory students participating in the second year. CCR data for 2013 revealed 89 preparatory students contributed a total of 111.5 points to the overall CCR score for the high school while non-preparatory students contributed 67. Although the study showed no statistical difference between preparatory and non-preparatory students, overall the results indicated that CTE programs and pathways prepare students in academics and technical areas in rural PLA schools and have a positive impact on CCR.

In summarizing the findings, it is important to reach back to the overarching question developed to guide the study. What impact do career and technical education preparatory students have on the college and career readiness accountability results for a persistently low achieving high school in rural Appalachia Kentucky? The absence of significant statistical differences in college and career readiness scores between preparatory and non-preparatory groups validated the null hypothesis. This result could be viewed as a positive outcome, an educational victory for career and technical education meaning that preparatory students were perceived as equal contributors to the high school's

CCR accountability. This is encouraging since the CCR results account for 20% of a Kentucky high school's total accountability and needed for a high school to overcome its PLA status. The study also brings to light that Kentucky's new model assigns the same point value to career readiness as it does college readiness making the stakes greater than ever before for career and technical education as it is solely responsible for the career readiness portion of CCR in Kentucky (Kentucky Office, 2014).

REFERENCES

About Us – OCTE/Kentucky Tech. (2013). Retrieved July 13, 2013, from http://kytech.ky.gov/FactSheet.htm

ACT WorkKeys Overview. (2013). Retrieved July 14, 2013, from http://www.act.org/ products/workforce-act-workkeys/

ACT. (2006). *Ready for college and ready for work: Same or different?* Retrieved from http://www.act.org/path/policy/pdf/ReadinessBrief.pdf

ACT. (2011a). *America's most widely accepted college entrance exam*. Retrieved from http://www.act.org/aap/index.html

ACT. (2011b). *WorkKeys.* Retrieved from http://www.act.org/workkeys/

ACT. (2011c). *National career readiness certificate.* Retrieved from http://www.act.org/ certificate/

ACT. (2013). *WorkKeys.* Retrieved from http://www.act.org/workkeys/

Alliance for Excellent Education. (2010).*Current challenges and opportunities in preparing rural high school students for success in college and careers: What federal policymakers need to know*. Washington, DC. Retrieved from http://www.all4ed.org/files/RuralHSReportChallengesOpps.pdf. p 1–43.

Ananda, S. (2002). *Supporting high school students through assessment of academic and industry-valued skills: What have we learned?* Retrieved from http://www.wested.org/onlinepubs/highschoolassessment.pdf

Appalachian Regional Commission. (2013). *The Appalachian region*. Retrieved from http://www.arc.gov/appalachian_region/TheAppalachianRegion.asp

Atkinson, J. (2009). *Letter to North Carolina stakeholders from state superintendent*. Retrieved from http://www.ncpublicschools.org/docs/cte/strategic-plan.pdf

Bivins, L. (2010). Boosting laborforce: Competitiveness in Wayne County, North Carolina. *Economic Development Journal*, *9*(3), 12-17.

Blackhurst, A. E., Auger, R. W., & Wahl, K. H. (2003). Children's perceptions of vocational preparation requirements. *Professional School Counseling, 7*(2), 58-67. Retrieved from http://search.proquest.com/docview/213262778?accountid=10628

Boykin, W., Dougherty, C., & Lummus-Robinson, M. (2010). Ready for all destinations. *The School Administrator*, *6*(67), 16-20.

Bradley, R., & Corwyn, R., (2002). Socioeconomic status and child development. Annual Review of Psychology. Vol. 53: 371-399

Bragg, D. D., Loeb, J. W., Gong, Y., Deng, C. P., Yoo, J. S. and Hill, J. L. (2002) Transition from high school to college and work for tech prep participants in eight selected consortia. National Research Center for Career and Technical Education (NRCCTE). St. Paul, MN:

Bryan, J. A., & Holcomb-McCoy, C. (2010). Editorial introduction: Collaboration and partnerships with families and communities. *Professional School Counseling*, *14*(1), II-II,III,IV,V. Retrieved from http://search.proquest.com/docview/757686430?accountid=10628

Career and Technical Education. (2014). *Student certification*. Retrieved from http://ctebrevard.com/IndustryCert-Student.htm

Carr, P. J., & Kefalas, M. J. (2009). *Hollowing out the middle: The rural brain drain and what it means for America*. Boston, MA: Beacon Press.

Castellano, M., Stringfield, S., & Stone, J. (2003). Secondary career and technical education and comprehensive school reform: Implications for research and practice. *Review of Educational Research. 73*(2). 231–272.

Castellano, M., Stone, J. R., Stringfield, S., Farley, E. N., & Wayman, J. C. (2004). The effect of cte-enhanced whole school reform on student coursetaking and performance in english and science. *Review of Educational Research. 73*(2). 231–272.

Cohen, M., & Besharov, D. J. (2002). The role of career and technical education: implications for the federal government. *Office of Vocational and Adult Education, U.S. Department of Education. 54.* Retrieved from www2.ed.gov/about/offices/list/ovae/pi/hs/besharov.doc

Cohen, M., & Besharov, D. J. (2004). *The role of career and technical education: Implications for the federal policy*. Retrieved from Office of Vocational and Adult Education, U.S. Department of Education: http://www.aei.org/files/2004/05/01/20050330_ role of CTE.pdf

College-career readiness is bright spot for state's schools new test results show. (2012). Retrieved from http://www.kyforward.com/2012/11/college-career-readiness-is-bright-spot-for-states-schools-new-test-results-show/

Commonwealth of Kentucky, Office of the Governor. (2012). Beshear overhauls career and technical education in Kentucky. [Press release]. Retrieved http://migration.kentucky.gov/Newsroom/governor/20120828ctereorg.htm

Commonwealth of Kentucky, Office of the Governor. (2013). Kentucky breaks into top 10 in national education ranking. [Press release]. Retrieved from http://education.ky.gov/comm/news/Documents/R003%20QC%20jont.pdf

Daggett, W. R. (n.d.). *Jobs and the skills gap.* International Center for Leadership in Education. Retrieved from http://www.leadered.com/pdf/CTE%20white%20paper.pdf

Daggett, W. R. (2002). *The future of career and technical education.* International Center for Leadership in Education. Retrieved from http://www.leadered.com/pdf /CTE%20white%20paper.pdf

Daggett, W. R. (2003). *The future of career and technical education*. International Center for Leadership in Education. Retrieved from ERIC Document Reproduction Service. (No. ED 476028)

Daugherty M., & Wicklein, R. (1993). Mathematics, science, and technology teachers' perceptions of technology education. *Journal of Technology Education*, *4*(2), 28-43.

Edson, (1983). *Work, youth, and schooling*. C.H. Educational Studies, 14(3), 239.

Erekson, T., & Shumway, S. (2006). Integrating the study of technology into the curriculum: A consulting teacher model. *Journal of Technology Education*, *18*(1), 27-38.

Douglas, B. (1986). *An analysis of the academic composites of the armed services vocational aptitude battery (asvab) and the math and verbal sections of the preliminary scholastic aptitude test (psat), the scholastic aptitude test (sat), and the american college test (act): A correlation study.* Southern Illinois University at Carbondale. UMI Dissertations Publishing. Retrieved http://search.proquest.com.libproxy.eku.edu/docview/303520438?accountid=10628

Dubois, G., & Westerman, G. (2007). Virginia career readiness certificate. *Community College Journal of Research & Practice, 31*(6), 535-536. doi:10.1080/10668920701359961

Duncan, Arne. (2012). *Investing in America's future: A blueprint for transforming career and technical education.* Washington, DC: U.S. Department of Education, Office of Vocational and Adult Education. Retrieved from http://www2.ed.gov/about/offices/list/ovae/pi/cte/transforming-career-technical-education.pdf

Education Assessment and Accountability Review Subcommittee. (2012). *Minutes of the Meeting of the 2012 Interim, August 14, 2012*. Retrieved from http://www.lrc.ky.gov/minutes/eaars/120814OK.HTM

Matthews, C. (2013). *State and National Grades Issued for Education Performance, Policy; U.S. Earns a C-plus, Maryland Ranks First for Fifth Straight Year.* Education Week, 1*26*(42), 13. Retrieved from http://www.edweek.org/media/QualityCounts2013_Release.pdf.

Eller, R. D. (2008). *Uneven ground: Appalachia since 1945*. Lexington, KY: The University Press of Kentucky.

Elliot, J., & Deimler, B. (2007). The Premier Educational Delivery System. *Techniques: Connecting Education & Careers, 82*(1), 44-46. Retrieved from Academic Search Premier database.

Fayette County Public Schools. (2013) *It's about kids: Background, understanding college and career readiness*. Retrieved from http://www.fcps.net/media/803266/background.pdf

Floyd, L. S. and Hargis B. (2012). *How to present college and career readiness to districts*. PowerPoint presentation. KACTE Conference. Louisville, KY. July 16, 2012.

Floyd, L. S. and Hargis B. (2013a). *Using cte to improve college and career readiness accountability in kentucky*. PowerPoint presentation. Careers Conference. Madison, WI. Jan 29, 2013.

Floyd, L. S. and Hargis B. (2013b). *Kentucky elevates cte with a new college and career readiness accountability model*. PowerPoint presentation. ACTE Conference. Las Vegas, NV. December 6, 2013.

Full Text of Obama's Education Speech. (2008, May 28). *The Denver Post.* Retrieved from http://www.denverpost.com

Good Works, Inc. (2012). *Appalachia is one of the poorest regions in the United States*. Retrieved from www.good-works.net

Gordon, H., Yocke, R., Maldonado, C., Saddler, S. (2007). Selected career and technical education teachers' perceptions of the no child left behind act (public law 107-110): an exploratory study. *Journal of Career and Technical Education, 23*(1), 121–132.

Governor Steve Beshear's Communications Office. (2012). *Gov. Beshear overhauls career and technical education in Kentucky*. Retrieved from http://migration.kentucky.gov/newsroom/governor/20120828ctereorg.htm

Grubb, W. N. (1997). Not there yet: prospects and problems for 'education through occupations'. Journal of vocational education research 22(2) pp.115-122.

Hagen, S. (2010). *The effects of mandated career and technical education (CTE) on the college and career preparation of high school students* Doctoral dissertation. Purdue University.

Hardré, P., Sullivan, D., & Crowson, H. (2009). Student characteristics and motivation in rural high schools. *Journal of Research in Rural Education, 24*(16). Retrieved from http://jrre.psu.edu/articles/24-16.pdf

Hargis B. (2010). *Career and technical education program alignment with local workforce needs*. (Doctoral dissertation, Eastern Kentucky University). Retrieved from http://encompass.eku.edu/etd/48/

Holliday, T. (2012). *Interim accountability testing system: Validation and research agenda; validation studies and evidence for reliability*. p. 1–15.

Hudson, L., & Laird, J. (2009). *New indicators of high school career/technical education coursetaking: Class of 2005* (NCES 2009-038). Washington, DC: National Center for Education Statistics, Institute of Education Sciences, U.S. Department of Education.

Hull, D. (2003). Redefining CTE: Seizing a unique opportunity to help the "neglected majority" become world-class students, workers and citizens. *Techniques*, *78*(5), 30-36. Retrieved from http://libproxy.eku.edu/login?url=http://search.proquest.com.libproxy.eku.edu/docview/216131145?accountid=10628

Hyslop, A. (2011). Leadership matters: CTE and 21st century skills in college and career readiness. *Techniques*, 10–11.

Irvin, M. J., Byun, S., Meece, J. L., Farmer, T. W., & Hutchins, B. C. (2012). Educational barriers of rural youth: Relation of individual and contextual difference variables. *Journal of Career Assessment*, *20*(1) 71-87. Retrieved from http://jca.sagepub.com/content/20/1/71.full.pdf+html

Johnson, M. A., & Stephens, M. L. (2012). Race to the top and the exclusion of welfare recipients from educational policy discourse. *Adult Learning*. *23*(4). Retrieved from http://web.ebscohost.com.libproxy.eku.edu/ehost/pdfviewer/pdf viewer?sid=be9db183-7fc7-4e81-8d92-39829e35c509%40sessionmgr112&vid= 12&hid=11

Kentucky Council on Postsecondary Education. (2011). *Senate Bill 1.* Retrieved from http://cpe.ky.gov/policies/academicinit/senbill1/

Kentucky Department of Education (2011a). *Persistently low-achieving schools identified*. Retrieved from http://education.ky.gov/comm/news/Documents/R089pla.pdf

Kentucky Department of Education. (2011b). *Senate Bill 1 (2009) college and career readiness.* Retrieved from http://www.education.ky.gov/kde/instructional+resources/secondary+and+virtual+learning/senate+bill+1+(2009)+college+and+career+readiness.htm

Kentucky Department of Education. (2012). *Unbridled learning accountability model*. 1-16. Retrieved from http://education.ky.gov/comm/UL/Documents/WHITE%20PAPER%20062612%20final.pdf

Kentucky Department of Education. (2013a). *Career and technical education: Technical education database system.* Retrieved from http://education.ky.gov/CTE/Pages/default.aspx

Kentucky Department of Education. (2013b). *KOSSA and Industry certification 2013*. Retrieved from http://education.ky.gov/CTE/Documents/20122013ValidKOSSAandIndustryCertifications.pdf

Kentucky Office of Career and Technical Education. (2014). Retrieved from http://education.ky.gov/CTE/Pages/default.aspx

Kentucky Office of Career and Technical Education Program Assessment. (2012). 20-24 Retrieved from http://www.kytech.ky.gov/PADoc1113.doc

Kentucky's Plan for College and Career Readiness. (2011). Retrieved from http://education.ky.gov/educational/CCadv/op/Documents/KentuckysPlanforULCCRw.pdf

Kentucky's School Improvement Grants Application. (2010). Retrieved from http://www2.ed.gov/programs/sif/summary/kyapp.pdf

Kentucky serves as model in statewide adoption of the National Career Readiness Certificate. (2011). *Activity, 49*(2). Retrieved from http://www.act.org/activity/spring2011/kentucky.html

Kentucky School Report Card. (2013). Retrieved from http://applications.education.ky.gov/SRC/

Kentucky State Report Card. (2013). Retrieved from http://applications.education.ky.gov/SRC/AccountabilityByState.aspx

KOSSA. (2013). *Kentucky occupational skill standards and assessments frequently asked questions*. Retrieved from http://education.ky.gov/AA/distsupp/Documents/KOSSA_FAQ.pdf

Konz, A. (2013). What you need to know about Kentucky's unbridled learning statewide testing system. *Courier Journal*. Retrieved from http://www.courier-journal.com/article/20130926/NEWS0105/309260085/What-you-need-know-about-Kentucky-s-Unbridled-Learning-statewide-testing-system?nclick_check=1

KRS 160.346. Retrieved from http://www.lrc.ky.gov/Statutes/statute.aspx?id=40246

Levesque, K. (2003). *Trends in high school vocational/ technical coursetaking: 1982–1998* (NCES 2003-025). Washington, DC: National Center for Education Statistics, Institute of Education Sciences, U.S. Department of Education.

Levesque, K., Laird, J., Hensley, E., Choy, S. P., Cataldi, E. F., & Hudson, L. (2008). *Career/technical education in the United States: 1990 to 2005* (NCES 2008-035). Washington, DC: National Center for Education Statistics, Institute of Education Sciences, U.S. Department of Education.

Meeder, H. (2008). The Perkins act of 2006: Connecting career and technical education with the college and career readiness agenda, Washington, DC: Achieve, Inc.

Mims, S. M. (2004). *Secondary teachers' perceptions of school-to-work programs on high school completion of students with and without disabilities* (Doctoral dissertation, Capella University). Retrieved from http://search.proquest.com/docview/305041928?accountid=10628

Mitkos, Y., & Bragg, D. (2008). Perceptions of the community college of high school counselors and advisors. *Community College Journal of Research and Practice*, *32*(4-6), 375-390.

National Center for Education Statistics. (2009). *Career/technical education (CTE) statistics*. Retrieved from http://nces.ed.gov/surveys/ctes/tables/h123.asp

National Center for Education Statistics. (2012). *Postsecondary and labor force transitions among public high school career and technical education*. p. 1-24. Retrieved from http://nces.ed.gov/pubs2011/2011234.pdf

North Carolina's Career and Technical Education. (2009). *Strategic plan reinventing North Carolina's career and technical education system.* Retrieved from http://www.ncpublicschools.org/docs/cte/strategic-plan.pdf

O'Hara, F. (2009). *Kentucky's response to the vocational education act of 1963: Leadership for the development of a unique system of secondary area technology centers.* University of Kentucky). ProQuest Dissertations and Theses,(PQDT) p. n/a

Phelps, D. J. (2002). *The No Child Left Behind Act of 2001: Opportunities for career and technical education*. Washington, DC: National Association of State Directors of Career and Technical Education Consortium.

Patterson, S. (n.d.) Smith-Hughes Act of 1917 (PL 347). Retrieved from http://jschell.myweb.uga.edu/history/legis/smithughes.htm

Pittman, K. J. (2010). College and career readiness: co-founder of the ready by 21 national partnership asks, even if students graduate, are they really equipped for the next stage? *The School Administrator*, *6*(67), 10-14. Retrieved from http://www.aasa.org/SchoolAdministratorArticle.aspx?id=13536

Raizen, S. A., Sellwood, P., Todd, R. D., & Vickers, M. (1995). *Technology education in the classroom: Understanding the designed world*. San Francisco, CA: Jossey-Bass Publishers.

Regan, B. (2008). Why we need to teach 21st century skills—and how to do it. *MultiMedia & Internet@Schools, 15*(4), 10-13. Retrieved from http://www.internetatschools.com/

Articles/Editorial/Features/Why-We-Need-to-Teach-21st-Century-Skillse28094And-How-to-Do-It-5bAvailable-Full-Text2c-Free5d-61011.aspx

Rose, M. A. (2007). Work measurements: Interdisciplinary overlap in manufacturing and Algebra I. *Technology and Engineering Teacher*, *66*(7), 6-11.

Rosenbaum, J. E. (2001). Beyond college for all: career paths for the forgotten half. New York: Russell Sage Foundation.

Rottinghaus, P., Lindley, L. D., Green, A., & Borgen, F. H. (2002). Educational aspirations: The contribution of personality, self-efficacy, and interests. *Journal of Vocational Behavior*, *61*, 1-19.

Sabie, A. (2008). The pathway from Baghdad to tech prep: A success story. Waco, TX: Cord Communications, Inc.

Sanders, M. G., & Jordan, W. J. (Eds.). (2000). *Schooling students placed at risk: Research, policy, and practice in the education of poor and minority adolescents*. Routledge.

Sawchuk, S. (2009). Motives of 21st-century-skills group questioned. *Education Week, 29*(14), 18-21. Retrieved from http://libproxy.eku.edu/login?url=http://search.ebscohost.com/login.aspx?direct=true&db=eric&AN=EJ868030&site=ehost-live&scope=site

Saylor, J. (2008). Applying work-ready tools. *Techniques*, *83*(4), 62-63. Retrieved http://search.proquest.com/docview/216124585?accountid=10628

Schafft, K. A., & Jackson, A. Y. (2010). *Rural education for the twenty-first century: Identity, place, and community in a globalized world*. University Park, PA: The Pennsylvania State University Press.

Schellenberg, R., & Grothaus, T. (2011). Using culturally competent responsive services to improve student achievement and behavior. *Professional School Counseling*, *14*(3), 222-230. Retrieved from http://search.proquest.com/docview/851623910?accountid=10628

Silverberg, M., Warner, E., Fong, M., & Goodwin, D. (2004). *National assessment of vocational education: Final report to congress*. Washington, DC: U.S. Department of Education, Office of the Under Secretary, Policy and Program Studies Service.

Southern Regional Education Board. (2006). *Getting students ready for college and careers*. Retrieved from http://publications.sreb.org/2010/10V26_Senior_Transitional_Math.pdf

Stern, D., Finkelstein, N., Stone, J. R., III, Latting, J. & Dornsife, C. (1995). School to work: research on programs in the united states. Washington, DC: Taylor and Francis.

Stone, I. J., Alfeld, C., & Pearson, D. (2008). Rigor and relevance: Enhancing high school students' math skills through career and technical education. *American Educational Research Journal*, *45*(3), 767-795. doi:10.3102/0002831208317460

Stone, J. R. III, Alfeld, C., Pearson, D., Lewis, M. V., & Jensen, S. (2006). Building academic skills in context: Testing the value of enhanced math learning in CTE. *American Educational Research Journal*, *45*(3), 767-795. doi:10.3102/0002831208317460

Tang, M., Pan, W., & Newmeyer, M. D. (2008). Factors influencing high school students career aspirations. *Professional School Counseling*, *11*(5), 285-295. Retrieved from http://search.proquest.com/docview/213337775?accountid=10628

ThinkKentucky.com. (2013). Retrieved from http://thinkkentucky.com/selectkentucky/

Transforming Education in Kentucky. (2011). *Breaking new ground: Final report of the governor's task force on transforming education in Kentucky.* Retrieved from http://www.kytech.ky.gov/TEK_final_report_draft.pdf

Kantor, H. & Tyack, D. B. (1982). Work, youth, and schooling: historical perspective on vocationalism in american education. Stanford: Stanford University Press. 367.

US Department of Education. (2010). Overview information; race to the top fund; notice inviting applications for new awards for fiscal year (FY) 2010; notice. *Federal Registration*, *75*(71), 19496-19531. Retrieved from http://www.gpo.gov/fdsys/pkg/FR-2010-04-l4/pdf/2010-8376.pdf

Visher, M., Bhandari, R., & Medrich, E. (2004). High school career exploration programs: Do they work?. *Phi Delta Kappan*, *86*(2), 135-138.

Walton, E. (2012). The instructional capacitor. *Principal Leadership*. Reston, VA. April 2012. 54 – 56. Retrieved from http://www.nassp.org/Content/158/pl_apr12_walton.pdf

Wicklein, R. C. (2006). Five good reasons for engineering as the focus for technology education. *The Technology Teacher*, *65*(7), 25-29.

Wicklein, R., & Hill, R. (1996). Navigating the straits with research or opinion? Setting the course for technology education. *International Journal of Technology and Design Education*, *6*(1), 31-43.

White, R., & Medrich, E. (2002). Performance measurement for accountability: Lessons from the school-to-work experience. *Phi Delta Kappan*, *84*(4), 289. Retrieved from http://libproxy.eku.edu/login?url=http://search.ebscohost.com/login.aspx?direct=true&db=aph&AN=8614832&site=ehost-live&scope=site

Winters, K., Williams, D., Kelly, D., McGaha, V., Stine, K., Thayer, D., & Westwood, J. (2009). *Kentucky legislature SB1 09RS www version*. Retrieved from http://www.lrc.ky.gov/record/09RS/SB1.htm

Wright, M. D. (2004). *Change in technology teacher education*? Paper presented at the Mississippi Valley Technology Teacher Education Conference. Rosemont, IL.

Wright, M.D., Washer, B.A., Watkins, L., and Scott, D.G. (2008). Have we made progress? Stakeholder perceptions of technology education in public secondary education in the united states. *Journal of Technology Education*, 20(1): 78-93.

LINDA SMITH FLOYD
Linda.floyd@education.ky.gov or Linda_Floyd3@mymail.eku.edu

Education

EASTERN KENTUCKY UNIVERSITY ◆Doctorate in Educational Leadership & Policy Studies ◆Superintendent Certification ◆Professional Certificate for Instructional Leadership ◆Principal Grades K – 12, Levels I & II ◆Certificate for Vocational School Principal ◆Education Supervision/Coordination ◆Master of Arts in Education

UNIVERSITY OF KENTUCKY ◆9 graduate hours ◆1993

UNION COLLEGE ◆Bachelor of Science ◆Summa Cum Laude ◆May, 1982 ◆Double Major: Bus. Administration & Office Administration ◆ Minor: Computer Science

SUE BENNETT COLLEGE ◆Associate of Arts in Office Administration ◆1979

Experience

ADMINISTRATIVE CONSULTANT, KENTUCKY DEPARTMENT OF EDUCATION, OCTE Frankfort, KY ◆August 2014 – Present ◆Responsible for evaluations, leadership and support of 20 Area Technology School Principals in Eastern Ky. and serve as liaison between OCTE, KY Tech and local school districts

PRINCIPAL, KY TECH-GREEN CO. AREA TECHNOLOGY CENTER, Greensburg, KY ◆August 2012 – July 2014 ◆Responsible for providing CTE pathways to middle and secondary students from Campbellsville, Green and Taylor County School Districts

AREA SUPERVISOR, DEPT. OF WORKFORCE DEVELOPMENT, OFFICE OF CAREER & TECHNICAL EDUCATION, Frankfort, KY ◆January 2004 – July 2012 ◆Responsible for evaluations, leadership and support of 26 Area Technology Center Principals in Eastern and South Central Kentucky

PRINCIPAL, KY TECH-KNOX CO. AREA TECHNOLOGY CENTER, Barbourville, KY ◆March 1998 – January 2004 ◆ Leader for school serving secondary students from Barbourville, Knox Central, Learning Academy, & Lynn Camp High Schools

DEPARTMENT CHAIR & INSTRUCTOR, LAUREL CO. STATE VO-TECH SCHOOL, London, KY ◆August 1988 – March 1998 ◆Accounting/ Business Technology

NETWORK ADMINISTRATOR & ASSOCIATE PROFESSOR, SUE BENNETT COLLEGE, London, KY ◆June 1984 – Aug. 1988 ◆Business & Computer Science

SOMERSET COMMUNITY COLLEGE, Somerset, KY, 1995-1998 ◆ Adjunct Faculty

EASTERN KENTUCKY UNIVERSITY, Richmond, KY, 1993-1997 ◆ Adjunct Faculty

National and State Conference Presentations

- ✓ Rural Ed. National Forum ◆2014, OH ◆Partnerships With Business & Industry
- ✓ SREB/TCTW National Conference ◆2014, OK ◆High School Credit for Middle School Students ◆ Using Robotics to Build Relationship with Industry for Improved Workforce ◆Using Multimedia Program to Produce School Newscast
- ✓ ACTE National Conference ◆2013, NV ◆Kentucky Elevates CTE with CCR
- ✓ National Careers Conference ◆2013, WI ◆Using CTE to Improve CCR
- ✓ Kentucky Association of School Administrators ◆2012, KY ◆Making College & Career Readiness Have the Greatest Impact on District Accountability
- ✓ KY Assoc. for Career & Technical Education ◆2012, KY ◆Presenting CCR Data
- ✓ KY Assoc. for Career & Technical Education ◆2012, KY ◆Empowering Teachers
- ✓ KASA conference and district trainings ◆2011, KY ◆Deconstruction of Standards
- ✓ National Education Conference ◆2000, TN ◆Implementing a Freshman Academy