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The Impact of Secondary Career and Technical Education on Postsecondary Career and Educational Placement

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by

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Declaration of Originality

I do hereby declare and attest to the fact that this is an original study based solely upon my own scholarly work at Lindenwood University and that I have not submitted it for any other college or university course or degree.

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Abstract

The purpose of this research was to provide evidence of the impact career and technical education courses have on students after graduation. Numbers of Career and Technical Education (CTE) completers have continually dropped at the participating schools for the past five years. Five categories of placement after graduation were studied including the following: college, employment, postsecondary vocational training, military, and no placement. Archival data were gathered from postgraduate surveys conducted by high schools as required by the Missouri Department of Elementary and Secondary Education. Data were collected for graduates in 2011, 2012, and 2013 from four area high schools that provide CTE training to some students at their own high schools and send a portion of students to an area career center for additional offerings. A Pearson product-moment coefficient of correlation (Pearson *r*) was calculated, and *t*-tests were used to assess the the data. The findings revealed large positive relationships between completers of CTE programs and placement in college, employment, or related locations, yet the results of the *t*-test indicated there was no significant difference (at $p < .05$) between the placement for students who attended either a District or Area Career and Technical facility. This research may assist schools in presenting the benefits of CTE training to fifth- through tenth-grade students, provide ways for schools to better implement CTE programs, and to make the programs more accessible to future students.

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Chapter One: Introduction

While some students in the United States attend a two- or four-year college, a number of other students leave high school and attempt to enter the workforce immediately (Radcliffe & Bos, 2013). In a recent study by Radliffe and Bos (2013), almost one-third of students had a career goal and planned to enter some type of technical, post-secondary training or the workforce after graduation. Because of this, "states are adopting various policy initiatives to increase students' preparedness for life after high school" (Gaertner, Kim, DesJardins, & McClarty, 2014, p. 145).

However, there is a discouraging trend with only one-third of eighth-grade students achieving mathematics, reading, writing, and science proficiency (Radcliffe & Bos, 2013). Low National Assessment of Educational Progress (NAEP) scores and a national average of 1.2 million annual student dropouts create a real concern of whether students will be ready for college or a career (Radcliffe & Bos, 2013). While it may not be necessary for every student to be skilled in calculus and other advanced coursework, all students should have a base of "core academic subject knowledge and skills," which encompasses English, mathematics, science, social studies, world languages, and the arts (Conley, 2010, p. 35). Further, "some studies indicate that the levels of academic preparation required for colleges and careers are essentially equivalent" (Gaertner et al., 2014, p. 146).

Within this study, the choices students make concerning class selection and the impact those choices have on post-secondary choices and successes were examined. The resulting research will affect future planning by the participant schools. This study will also assist in determining the impact career and technical coursework has had on student placement.

Background of the Study

For several years, School District A has allowed students to self-select participation in one of three threads of instruction. Students could choose to participate in a basic requirement schedule, which included courses such as Pre-Algebra, Algebra, and Geometry for Mathematics (MA); English I, English II, and English III for English Language Arts (ELA); and Physical Science, Biology, and Anatomy for Science (SC). Students could also choose a more difficult set of courses including College English, Trigonometry, Calculus, Physics, Chemistry, and a number of dual credit college courses. A third option was to pursue a course load in a particular Career and Technical Education (CTE) pathway.

It is the goal of the Missouri Department of Elementary and Secondary Education (MODESE) Career Education to combine academics and occupational skill training to better prepare students of all ages for the job market ((MODESE, 2015a). Course concentrators in a CTE area are required to earn three or more sequential credits in any state-approved CTE program for grades 9-12 (MODESE, 2015c). Sequential credits can consist of courses that cross over into different program areas (MODESE, 2015c). Completion of a program can be determined by the local school district; however, this completion should include a combined sequence of classes adding up to three or more units of credit (MODESE, 2015c).

Theoretical Framework

The theoretical framework for this study was based upon social cognitive career theory (SCCT), consisting of three segmented models, which explain “interest development, choice-making, and performance and persistence in educational and

vocational contexts" (Brown & Lent, 2013, p. 559). The SCCT draws heavily from Bandura's general social cognitive framework and attempts to build connections among theoretical approaches of career development (Brown & Lent, 2013). There is an assumption, per Bandura, that "positive academic efficacy beliefs elevate educational expectations that lead to academic success" (as cited in Brown & Lent, 2013, p. 1).

Statement of the Problem

In the United States, the economy has traditionally been driven by manufacturing workers (Childress, 2012). Over the last couple of decades, the country has seen a dramatic shift from manufacturing employers to service industries (see Figure 1) (Childress, 2012). Along with the manufacturing shift, a change has also occurred in the education of students (Rose, 2012). Career and technical education has been pushed back by an ever-increasing move to provide all secondary students with the tools to enter college (Rose, 2012). The U.S. Commerce Department estimated that by 2018, science, technology, engineering, and math (STEM) employment will grow by 17% compared to 9.8% for other occupations (Gordon, 2014).

Due to this trend, the enrollment of secondary students in CTE courses has steadily declined in some parts of Missouri (National Assessment of Career and Technical Education [NACTE], 2014). This is particularly true of one small rural school in south central Missouri, designated as School District A. While enrollment in CTE courses has remained steady in two CTE programs available on site, the third program has been on a steady decline in enrollment. Further, enrollment at the area CTE training center, hosted by School District D, has steadily declined, as well. This training center

enrolls students from the host high school as well as three other sending high schools in the same and adjoining counties. These include School Districts B, C, and D.

Production Occupation	2008 Employment	2018 Projected Employment	†Percent Change
Assemblers and Fabricators	1,950,900	1,913,100	-2
Food Processing	706,700	734,000	+4
Computer Control Programmers and Operators	157,800	164,500	+4
Machine Operators	1,028,400	899,000	-13
Machinists	421,500	402,200	-5
Tool and Die Makers	84,300	77,600	-8
Welding, Soldering, Brazing	466,400	455,900	-2
Book Binders and Bindery Workers	66,500	53,600	-19
Prepress Technicians and Workers	106,900	92,600	-13
Printing Machine Operators	195,600	185,000	-5
Textile, Apparel, and Furnishings	787,500	667,600	-15
Woodworkers	323,300	344,000	+6
Power Plant Operators	50,400	50,600	0
Stationary Engineers	40,600	43,800	+5
Water and Waste Treatment	113,400	135,900	+20
Inspectors	464,700	447,800	-4
Jewelers	52,100	54,800	+5
Medical Lab Technicians (fabricators)	95,200	108,300	+14
Painters (nonconstruction)	192,700	199,900	+4
Semiconductor Processors	31,600	21,600	-32
Photographic Process Workers	73,000	61,200	-16
Totals	7,409,500	7,113,000	
Difference	-296,500		
Average Change			-3.4

† Error due to rounding

Figure 1. Projected growth rates for general production occupations (excluding construction) in the U.S. From "Technological Impacts: Manufacturing and the Economy" by V. W. Childress, 2012, *Technology & Engineering Teacher, 71*(5), pp. 23-29. Copyright 2012 by the Bureau of Labor Statistics, comparing employment levels per manufacturing occupation in 2008 with those projected for 2018.

Purpose and Significance of the Study

The rationale for this research was to determine if there was statistical evidence supporting career and technical education as having a significant impact on student success after high school graduation in the form of continued vocational training or career success. This was accomplished by using data to determine if a correlation existed between students taking CTE courses and resulting postsecondary success. Also, examined were the differences between the placement for students who attended either a District or Area Career and Technical facility.

McEwan and McEwan (2003) stated schools must continue to explore whether CTE actually works. Students in School District A have continued to perform below expectations in college and career readiness (CCR), as well as on the American College Test (ACT). Analysis of data from the 2013 MODESE Annual Performance Report (APR) showed ACT scores as the lowest indicator for the high school in School District A.

According to the 2013 APR on the Missouri School Improvement Program 5 (MSIP 5) School Supporting Data sheet for indicator 3.1-3, the school district dropped from 52.8% of graduates performing at or above the state standard, to 51.7% in 2012, and finally to 42.7% in 2013 (MODESE, 2015c). For at least the past eight years, students have consistently scored an average between 18 and 20.5 on the ACT test (MODESE, 2015d). The trend has continued on a downhill slope, and past practice does not seem to be effective in the present.

Victoria Bernhardt (2013) expressed through her work on continuous school improvement that assessment scores can clarify what is going on in schools and districts

with student learning. Bernhardt (2013) noted, in the attempt to set up strategies for remediation when students do not meet indicators or standards, all too often efforts do not lead to hoped-for improvements. Currently, School District A offers no Advanced Placement (AP) courses for students. In the course directory for School District A, there are several dual enrollment courses in which students may participate. These include College English I and II, College Algebra, College Psychology, World Literature, Computers for Learning, and World History. These dual enrollment, college-level courses are intended to give "academic momentum as a potential mediator of the relationship between dual enrollment and educational outcomes" (Wang, Chan, Phelps, & Washbon, 2015, p. 1). The disadvantages to students for choosing dual enrollment courses include scheduling conflicts with other courses, cost, and lack of preparation prior to taking the courses (Stone, 2012).

In addition to dual enrollment courses, School District A offers CTE courses, which include Vocational Agriculture (AG), Business, and Family and Consumer Science (FACS) courses. Other vocational or career-oriented coursework may be obtained from the area CTE training center located off campus. Students who have reached their junior year, are not behind in credits, have good attendance, and have a desire to pursue vocational training may choose a program at the career center. Currently, the courses available include Masonry, Welding, Auto Mechanic Repair, and Media. Over the past three years, the Welding and Media classes at the area CTE training center located off campus have had full enrollment and have not been available to School District A students. During the 2012-2013 school year, School District A had four students attending the Area Career Center. In 2013-2014, one student from School District A took

courses at the area CTE training center. Currently, School District A has only two students attending vocational courses at the area CTE training center. While the numbers have dropped significantly for those attending the area CTE training center, the enrollment for School District A's on-campus CTE courses have remained steady for both Business and FACS.

The regular course of study plan for School District A leads students to take either Algebra I or Pre-Algebra during the freshman year. From there, students may choose to continue with Algebra II, Geometry, Trigonometry, Calculus, and Physics. Due to small class sizes, there are no middle-school level, eighth-grade advanced preparatory courses in Math, English, or Science. Additionally, School District A has one counselor for grades K-12 who spends approximately 65% of her time on high school areas such as career planning, readiness, and college preparedness.

The research may provide evidence for the importance of student participation in CTE courses. The implications may inform district policy regarding course sequence and future course offerings. Other contributions may include data, which will allow districts with similar demographics or problems to reconcile CTE solutions through the findings of this study.

Research questions and hypotheses. Research questions are used to specifically explain what the primary investigator intends to learn or understand (Maxwell, 2013). The following questions were used to determine whether CTE courses in a secondary setting have a significant impact on post-secondary training, education, or career success:

1. What is the correlation between students who participate in career and technical education at the secondary level and postsecondary placement in college?

$H1_0$: There is no correlation between students who participate in career and technical education at the secondary level and postsecondary placement in college.

2. What is the correlation between students who participate in career and technical education at the secondary level and postsecondary placement in a related occupation?

$H2_0$: There is no correlation between students who participate in career and technical education at the secondary level and postsecondary placement in a related occupation.

3. What is the correlation between students who participate in career and technical education at the secondary level and placement in postsecondary vocational training?

$H3_0$: There is no correlation between students who participate in career and technical education at the secondary level and placement in postsecondary vocational training.

4. What is the correlation of all students who completed career and technical education courses and placement after graduation?

$H4_0$: There is no correlation between students who completed career and technical education courses and placement after graduation.

5. What is the difference between District A students who attended Career and Technical Education courses at District A and post-secondary placement versus District A students who attended Career and Technical Education courses at the Area Career Center and post-secondary placement?

$H5_0$: There is no difference between District A students who attended Career and Technical Education courses at the District A site and post-secondary placement versus District A students who attended Career and Technical Education courses at the Area Career Center and post-secondary placement.

6. What is the difference between sending school district students from Districts B, C, and D who attended Career and Technical Education courses at Districts B, C, and D and post-secondary placement versus Districts B, C, and D students who attended Career and Technical Education courses at the Area Career Center and post-secondary placement?

$H6_0$: There is no difference between sending school district students from Districts B, C, and D who attended Career and Technical Education courses at Districts B, C, and D and post-secondary placement versus Districts B, C, and D students who attended Career and Technical Education courses at the Area Career Center and post-secondary placement.

Definition of Key Terms

For the purposes of this study, the following terms are defined:

Area career center. An area career center is a school which accepts secondary students from area high schools in a consortium for the purpose of training in career and technical education (MODESE, 2015a).

Career and technical education (CTE). Career and technical education (CTE) is training for a specific occupation in agriculture, trade, or industry through a combination of theoretical teaching and practical experience provided by many high schools in their commercial and technical divisions (MODESE, 2015a).

Career placement and success. Career placement and success are determined by employment in a field which is closely linked to the student's career and technical education completed in high school (MODESE, 2015a).

Correlation. A correlation is a relationship existing between two (or more) quantitative variables (Fraenkel, Wallen, & Hyun, 2015).

Pearson product-moment coefficient (Pearson *r*). The Pearson product-moment coefficient (Pearson *r*) is an index of correlation appropriate when the data represent either interval or ratio scales; it takes into account each pair of scores and produces a coefficient between 0.00 and +1.00 (Fraenkel et al., 2015).

Postsecondary placement. Postsecondary placement is the position a high school graduate holds six months after graduation. This may include college, technical education, or employment in a field related to the career and technical education courses taken in high school (MODESE, 2015a).

Purposive sample. A purposive sample is a nonrandom sample selected because prior knowledge suggests it is representative, or because those selected have the needed information (Fraenkel et al., 2015).

Significant impact. Significant impact is a correlation of 70%or higher in placement related to vocational study for each category (Casale-Giannola, 2012).

***t*-test.** A *t*-test is a parametric statistical test used to see whether a difference between the means of two samples is significant (Fraenkel et al., 2015).

Vocational education. Vocational education includes career and technical education (MODESE, 2015a).

Limitations and Assumptions

Demographics and geographical location were two limitations to this study. The sample in this study was limited to four public schools in south central Missouri. Each of the four districts is predominantly Caucasian, which may limit comparisons to other, more diverse districts. Additionally, a larger sample from other districts may yield more generalizable results.

Sample demographics. While it was the intent to use a sample from which inferences may be drawn about the general population, unknown demographic parameters may limit the impact of replication in a different geographical location. This was a study of four small rural high schools (A, B, C, and D). The largest district, School District D, had an enrollment of only 431 students. School District D also supports and directs the Area Career Center, receiving students from within its own district as well as from Districts A, B, and C. Each of the four school districts is located in two south central counties within the state of Missouri. This research was intended to be indicative of the entire region, state, or country; however, the sample was readily available and convenient ,which may result in wide confidence intervals.

Instrumentation. According to Fraenkel et al. (2015), a threat to the "validity of the instrumentation process in surveys can cause individuals to respond differently from how they might otherwise respond" (p. 407). While the data from the survey collected for the MODESE are archival, accuracy was dependent on the answers given by former students or their close relatives/acquaintances. Exactitude was further dependent on the human third-party collector charged with collecting and reporting data to the MODESE from each district.

Summary

Bernhardt (2013) stated when schools focus primarily on compliance, they tend to concentrate school improvement efforts on what and how they are being measured. School District A has to look beyond the low scores on the APRand ask what the district can do to help students find success at a higher level. This not only includes offering and promoting higher-level coursework, but also creating a culture where it is expected or preferred to enter college or post-secondary training after high school graduation. If neither of these options are possible, the students should be prepared to enter a chosen work field. This may require the entire school becoming involved in the preparatory phase for entering college, vocational training, or the work force. In addition, CTE courses will continue to decline in enrollment unless vocational programs can continue to show that such programs contribute to the academic success of students, motivate students to remain in school, and help students improve academically (Bolger, 2008). Many minority students do not receive appropriate academic or career training due to the lack of promotion from CTE programs (Fletcher & Cox, 2012).

Chapter Two includes an exploration of different aspects of Career and Technical Education. These aspects include a history of vocational education, curriculum and resources for career and technical programs, academic indicators, teacher and student relationships, making the choice between vocational education and a college degree, and college and career readiness. These topics help form a basis for further research into the effectiveness of CTE programs at preparing students for postsecondary outcomes.

Chapter Two: Review of Literature

A major question asked before a person invests time and resources into any endeavor is what the result of the investment will be. According to Kezar and Eckel (2002), "Transformational change alters the culture of the institution by changing select underlying assumptions of institutional behaviors, processes and products; is deep and pervasive and affects the whole institution; is intentional; and occurs over time'' (pp. 295-296). This is especially true when it comes to career and technical education (Washbon, 2012).

In times past, vocational education was used as an area for students who would not be successful in a college atmosphere; that is no longer true (Wilson, 2014). This successful combination of CTE students and college bound students is apparent, because, "as we begin to see barriers between CTE and academic courses diminish, a large number of students are reaping the benefits of these programs" (Wilson, 2014, p. 6). Career and technical education courses contribute greatly to 21st-century readiness by promoting certain skills (Fala, Strouse, Tully, & Viviano, 2012). These skills include employability, technical knowledge, and a foundation in lifelong education (Fala et al., 2012).

This research involved examination of what resources are available and utilized to prepare students for postsecondary work or training. Past practices and the evolution of CTE were examined. Literature of successful practices currently being utilized and the results from these practices are presented in this chapter.

There are six areas of focus within this research which give background and insight into CTE and its impact on the success of participating students. The six areas include the following:

1. History of Vocational Education
2. Curriculum and Resources
3. Academic Indicators
4. Teacher and Student Relationships
5. Choice Between Vocational Education and a College Degree
6. College and Career Readiness

These six areas of focus provided insight into the research questions regarding CTE course completion and postsecondary outcomes.

Theoretical Framework

For this study, writings within the history of vocational education in the United States were examined. The origin of vocational education and how it has been built into what United States has today is an interesting study (Greenberg, 2007). An examination of the historical derivation of vocational education funding up through modern CTE funding venues are important aspects to consider when discussing vocational education in the United States (Arum, 1998).

The Curriculum and Resources section of Chapter Two includes a review of methods and practices used by schools to encourage or to build interest in students to take CTE courses either at their home high schools or at an area vocational training center. This section also includes examination of resources used by schools to promote CTE programs and to prepare students for postsecondary work or training. Partnerships and work with legislative bodies are also examined as a part of this section.

The Academic Indicator section includes examination of various testing and assessment data, as well as performance rates on different summative testing regimens.

Specific testing and measurement tools are also examined as ways to measure student achievement and success in a vocational curriculum.

The literature section on Teacher and Student Relationships provides research-based evidence of the types of relationships formed by CTE instructors with their students and the results gained from those relationships. As in any academic or vocational classroom, the bond or interest built between the teacher and the students often reflects the success of imparting the knowledge or skills within the curriculum (Fritsch, 2013).

The section regarding Choice Between Vocational Education and a College Degree allows for an examination of the current reality in CTE education. The literature provides evidence of the benefit for continued enrollment of students in CTE coursework.

The College and Career Readiness section provides a review of literature on steps high schools in the United States are taking to prepare students for postsecondary life. Research also provides evidence of the degree to which high schools prepare students to immediately enter the workforce in the career field tied to the vocational path that was studied. Further, the section includes a review to what extent those students who immediately enter college are prepared for beginning college coursework.

History of Vocational Education

Secondary vocational education was introduced into public schools during the Progressive Era (Greenberg, 2007). In 1917, the United States Congress required federal aid for vocational education by passing the Smith-Hughes Act (Greenberg, 2007). Within the next decade, the numbers of students enrolled in vocational education courses increased by almost five times (Greenberg, 2007). Historically, vocational programs

have been the fields of study that connected schools to the ever-changing societal needs of the United States (Rhodes, 2014).

However, major funding for CTE did not occur until the late 1960s and 1970s (Arum, 1998). The percentage of public education funding geared toward vocational education rose from 1% in the early 1960s to over 5% by 1980 (Arum, 1998). This increase in funds was due to the thought that at-risk students would be more likely to remain in the school system if those students thought the vocational education received in high school would have an effect on later employment success (Arum, 1998). After 1980, governmental support dropped considerably due to a number of factors (Arum, 1998). One argument against spending money on vocational education was that those programs did not help these "working-class" students, but only separated them from higher educational achievement (Arum, 1998, p. 130). Another argument was given that public schools were not able to spend the funds efficiently (Arum, 1998).

One of the key sources of guidance and funding currently at the federal level is the Workforce Investment Act (WIA) of 1998 (Green, 2014). After extensive work and effort, the WIA has been revised and reauthorized as the Workforce Innovation and Opportunity Act (WIOA) (Green, 2014). The WIOA carries with it a number of provisions with direct impact on CTE programs in the United States (Green, 2014). The WIOA has engaged several new provisions to help meet the growing needs of career-educated workers (Green, 2014). These provisions include sequence of services, common measures, and direct contracting (Green, 2014).

The WIOA also brings several opportunities to the area of CTE (Green, 2014). These include one-stop infrastructure funding, workforce boards, combined state plans,

and employer satisfaction (Green, 2014). One-stop funding includes steps by which local partners must agree on how to finance these programs with money including Perkins money (Green, 2014). Workforce boards provide additional education which includes CTE guidance (Green, 2014). State plans of the WIOA can now be combined along with 11 other federal programs, which also include Perkins (Green, 2014). A new performance measure added with the passage of this act includes employer satisfaction (Green 2014). Most of this act took effect as of July 1, 2015 (Green, 2014).

While there are certainly legislative and other governmental pieces to CTE, it is important for continual dialogue on all legislative levels. This includes local governments, state legislatures, as well as national levels of government (Werden, 2014). In 2013, federal money was hit by sequestration (Baxter, 2012). This only increased the need for more contact with congressional members.

Curriculum and Resources

Resources. One of the difficulties faced by many high schools includes finding the resources to accomplish the task of preparing students for success in the postsecondary world (Werden, 2014). As noted under the section entitled History of Vocational Education, both the state and national legislatures have a great impact on vocational education (Werden, 2014). Much of the funding allotted for CTE programs, such as the Carl D. Perkins Career and Technical Education Act, has seen reductions (Baxter, 2011). As legislators have many different groups and interests vying for their action, it is imperative CTE programs keep visible to legislators both locally and nationally (Werden, 2014).

In a recent article, Rob Werden (2014) discussed the need for advocacy from the viewpoint of a career center director in Madison County, Illinois. Werden (2014) emphasized in promoting CTE programs, promoters must first be sincere, credible, knowledgeable, organized, patient, considerate, and grateful. Policymakers are essential for the continued funding and existence of CTE programs (Werden, 2014). Having these people aware of the benefits and successes of CTE programs will allow them to be more supportive of any legislation that supports such programs (Werden, 2014).

Sincerity is mentioned, because as Werden (2014) pointed out, legislators are "some of the best" at perceiving false enthusiasm (p. 47). Legislators, for the most part, work very hard to be sincere in their roles as servants of the public (Werden, 2014). Credibility and content knowledge go hand-in-hand following sincerity (Werden, 2014). Most legislators, when confronted with something, seek more information on that topic (Werden, 2014). When a CTE advocate has knowledge and can be the expert, credibility is gained (Werden, 2014).

Organization is a key element for an advocate to have as well (Werden, 2014). Phone calls are said to be the most effective way of reaching out to legislators (Baxter, 2011). Emails, while popular and sometimes less time-consuming, are often said to be overlooked, with some congressional offices only checking their email accounts once or twice a month (Baxter, 2011). In-person meetings are the way to build the strongest relationships (Baxter, 2011). Numbers of people making the contact also have a way of showing strength regarding any issue (Baxter, 2011). Having facts on programs, contact information of CTE area legislators, and knowledge of the reference numbers of

legislative actions and bills are all important when discussing current issues with people in place to make a difference (Werden, 2014).

Patience is also an important characteristic when advocating for CTE programs (Werden, 2014). Werden (2014) stated:

> Every family visiting with their 10-year old who has political ambitions, every special interest group with an agenda and every lobbyist with a business account wants a piece of the politician's time. Some want an hour, while some want just a quick photograph. If you want your time with him or her, you will have to be patient. (p. 47)

The point is policymakers are very busy people (Werden, 2014). It is therefore important that as an advocate for CTE, a person must not only be organized and prepared, but patient as well, to receive time with a legislator (Werden, 2014).

Partnerships. One of the enduring facets of vocational education is the ongoing partnership between successful career and technical education programs and local employers (Conley & McGaughy, 2012). Conley and McGaughy (2012) mentioned this as one characteristic demonstrated by schools showing success in accommodating standards for both college readiness and career readiness. Many opportunities present themselves through class assignments and agreements with nearby colleges (Conley & McGaughy, 2012). Concurrent or dual enrollment programs are transition programs which offer students experiences similar to actual college attendance and expectations (Conley & McGaughy, 2012). These partnerships can also involve data sharing, which can shape and pattern high school curriculum (Conley & McGaughy, 2012). Even further, this partnership can recast what skills students need to obtain in informational

reading and technology (Conley & McGaughy, 2012). Grading is often a subject discussed in high school and elementary improvement plans (Conley & McGaughy, 2012).

One example of partnerships working within the vocational arena was stated by David Ross, president and CEO of SAIT Polytechnic (Southern Alberta Institute of Technology) in Calgary (Southerst, 2014). Ross stated, "Not a day goes by that I don't talk to industry. Keeping industry close is critical. Because of them, our programs evolve and stay current" (as cited in Southerst, 2014, p. 51). Southern Alberta Institute of Technology uses several methods to prepare students for success both in school and afterward in their careers (Southerst, 2014). Simulators, co-op placements, practicums, and on-the-job instruction are just a few of the ways used to train students in practical preparation (Southerst, 2014). Based on these practices, SAIT has seen a large measure of success (Southerst, 2014). In 2013, 95% of SAIT's graduates were currently employed (Southerst, 2014). This is in large part due to the approximately 1,000 regional and national companies that have some type of connection with the school either as contributors or academic consultants (Southerst, 2014). For example, SAIT's MacPhail School of Energy at one point was given a $3.5 million oil rig with a gas plant for hands-on training to better prepare oil rig technicians (Southerst, 2014). Southern Alberta Institute of Technology also received a donation of $10 million in compressors and pumps for a power engineering lab (Southerst, 2014).

An added reason for the success of such programs is the responsiveness of the schools to industry needs (Southerst, 2014). This comes from a close working relationship between both vocational training schools and their industry counterparts

(Southerst, 2014). Emphasis was placed on this by Ann Marie Vaughan, president and CEO of the College of the North Atlantic in Stephenville, Newfoundland, where enrollment had grown more than 8% in the current year and 8% in the previous year (Southerst, 2014). Vaughn also stated, "Employers are involved not only in upfront design of programs but in review as well. They may tell us about new technology they will introduce or challenges they will face with aging equipment" (as cited in Southerst, 2014, p. 51). This communication keeps CTE schools abreast of the latest techniques, equipment, skills, and labor needed for the current job climate (Southerst, 2014).

According to Dion McGrath, president and CEO of Southeast College in southeastern Saskatchewan, the role of the college is to provide training nearer "to where it's needed and address labour market demands. We partner with NAIT (North Alberta Institute of Technology), SAIT, Saskatchewan Polytechnic, and Red River College to buy their curriculum, hire instructors, and bring their programs to SETI" (as cited in Southerst, 2014, p. 53). Much of this is in response to the discovery and processing of oil in southeastern Saskatchewan and southwestern Manitoba (Southerst, 2014). Due to a labor shortage of 1,000 jobs in a month, SETI built a new 44,000-square-foot facility to address these current needs of local industry (Southerst, 2014).

Another piece to a successful CTE program is preparing students for work after school (Konopnicki, 2014). In West Virginia, 21 school districts changed the way students began the school year (Jackson, 2013). When students returned to school, they did not go to a classroom, but instead went to work (Jackson, 2013). In these 21 West Virginia school districts, students began learning in courses that were restructured to feel like a workplace environment (Jackson, 2013). Some of the tasks students were required

to perform included clocking in at arrival, taking random drug tests, and going through an evaluation process based on their company's "bottom line" (Jackson, 2013, p. 36).

According to Kathi D'Antoni, West Virginia's associate superintendent for the division of technical, adult, and instructional education, "Our contacts in business and industry say that students may come out of high school with great skill sets but they don't understand business processes" (as cited in Jackson, 2013, p. 36). D'Antoni also reported, "They don't understand the importance of showing up on time and staying drug free, and that if you take off a couple of days to go deer hunting, that will affect the company's bottom line" (as cited in Jackson, 2013, p. 36). Therefore, students in these pilot programs are taught with the intention of developing soft skills such as critical thinking, problem solving, and adaptability to be successful as employees (Jackson, 2013).

As in the case of West Virginia, many other states and school districts are changing their career programs to better prepare students for today's work environment (Jackson, 2013). According to Kevin Baird, chairman of the Center for College and Career Readiness in Oakbrook Terrace, Illinois:

> Schools must redefine their missions, schools must come to understand that their goal is not simply to graduate a student, but to develop within that student the passion, skills, and resources to find their vocation, to operate successfully after high school, and to meet the demands of a workplace that changes every day. (as cited in Jackson, 2013, p. 36)

In the past, CTE programs were gauged by the ability to meet industry workforce needs (Jackson, 2013). However, as most workplaces have become more technologically

enhanced, according to Douglas Major, superintendent and CEO of Meridian Technology Center, “The shelf life of traditional programs has been drastically reduced” (as cited in Jackson, 2013, p. 36). According to Major, the career tech programs that do not change from teaching outdated processes are “obsolete in the eyes of business and industry” (as cited in Jackson, 2013, p. 37).

The omission of soft skills is often a reason given that millions of employment opportunities go unfilled in the United States (Jackson, 2013). For example, the ability to communicate effectively is a crucial skill in life regardless of the type of employment (Zande, 2011). There is an increasing demand for responsibility of employees to train themselves for the workforce (DiMattina & Ferris, 2013). This is in spite of a nationwide unemployment rate of more than 7% (Jackson, 2013). Soft skills are an additional need along with an understanding of how businesses work (Jackson, 2013). According to Major, “The ever-increasing sophistication of virtually all careers” requires these soft skills (as cited in Jackson, 2013, p. 37).

In the Manpower Group’s 2013 Talen Shortage Survey, it was found 39% of North and South American employers reported prospective candidates’ lack of soft and technical skills and a shortage of applicants as the reasons why many positions went unfilled (Jackson, 2013). In addition, the Manufacturing Institute reported 600,000 U.S. manufacturing jobs went unfilled because of a lack of applicants with the required skills to fill the positions during the 2012 year (Jackson, 2013). These statistics left approximately 83% of employers with shortages from moderate to severe in skilled worker hires (Jackson, 2013).

To meet the needs of this trend, current CTE programs are reconfiguring curriculum through three valuable and unique methods (Jackson, 2013). These include becoming project-based, real world-driven, and academically rigorous (Jackson, 2013). According to Major, CTE courses are shifting from a traditional process-driven approach to a project-based approach that enables students to research, problem-solve, and work together in teams to finish tasks (as cited in Jackson, 2013, p. 38). Major went on to say, "The old job-sheet method of completing steps one through ten to learn concept 'x' is no longer appropriate. Today's successful CTE programs use inquiry-based learning that requires students to apply knowledge to a wide array of situations" (as cited in Jackson, 2013, p. 38). Additionally, the creation of the Common Career Technical Core standards has worked to enhance and support higher expectations for career and technical education (Folkers, 2011). Over 42 states collaborated to establish these CCTC standards for secondary and postsecondary CTE coursework (Green, 2012).

One example that fits this scenario is West Virginia's Simulated Workplaces program (Jackson, 2013). This program is a model of project-based learning (Jackson, 2013). Within this program, students choose different projects to complete with their respective teams (Jackson, 2013). All of these projects contribute to their company's bottom line, according to West Virginia's D'Antoni (Jackson, 2013). One example of this may be agriculture. Students studying this program could research causes and effects of celiac disease and then create a report examining the foods that contribute to the disease, while ascertaining foods that could be contained within a gluten-free diet (Jackson, 2013). Results could then be passed on to bakers and supermarket managers who want to provide appropriate products for their customers who have celiac disease

(Jackson, 2013). By being involved in such projects, students can master content-area skills, while also being able to handle activities such as customer service and other techniques necessary in a real-world business environment (Jackson, 2013). According to Major, these types of project-based learning will help students:

> . . . discover the relevance of their core academic subjects. For many CTE students, the ability to apply mathematical theory to a project they are working on in their technical curriculum is the proverbial switch that brings light to the concept. Once they discover the use of the theory, it just makes sense and gives them the confidence they need to move forward in both their technical and their academic subjects. (as cited in Jackson, 2013, p. 38)

These hands-on applications of content will help students not only master concepts, but retain them for future use as well (Jackson, 2013). Achievement can be linked to involvement, which is defined as the amount of physical and psychological effort a student gives to a task (Lion, 2013). In addition to hands-on application, cooperative learning can be instigated through technology over great distances (Cheng, 2009). This opens up endless possibilities for application (Cheng, 2009).

Another aspect that continues to repeat itself when developing appropriate curriculum is the inclusion of real-world application established with the assistance and partnership of local businesses and with industry input (Jackson, 2013). This coincides with the need to prepare students for jobs in metropolitan America (Dougherty, 2013). According to Baird, curriculum "should reflect the real world, and instruction should lead to real-world application" (as cited in Jackson, 2013, p. 38). One example of this is found with a partnership existing between Pennsylvania's Lehigh Career & Technical

Institute (LCTI) and 14 local employers within the area (Jackson, 2013). This partnership gives local high school seniors employment, allowing them to use the technical skills they have learned in their CTE programs (Jackson, 2013). According to AJ Jorgenson, spokesperson for the Manufacturing Institute, a think tank affiliated with the National Association of Manufacturers, these employment opportunities include such jobs as precision machining, welding, cosmetology, and nursing (Jackson, 2013).

In Carrolton, Georgia, and Florence, Alabama, area school districts created a partnership with Southwire Company to provide part-time jobs for students who were found to be at-risk of dropping out of school (Jackson, 2013). According to Gary Leftwich, manager of media and community relations at Southwire, students attend school for half a day and then work one of the company's three shifts within a student plant (Jackson, 2013). The student plant is situated right next to the main facility of the company (Jackson, 2013). This program provides these students an $8 an hour wage and also eligibility for bonuses tied to attendance and production goals (Jackson, 2013). Over 400 students have participated within this program since the inception in 2007 (Jackson, 2013). According to Corey Bethel, Southwire program coordinator for Florence City Schools, "The main purpose is to increase students' skills and keep them on track to graduate. But when they graduate, they now have work experience, which is so valuable in helping them get another job" (as cited in Jackson, 2013, p. 40). There is some risk associated with such programs, however. More than 200,000 adolescents suffer from work-related injuries every year (Shendell et al., 2012).

In addition to partnering with industry, a modern-day vocational program must look at the global economy and atmosphere of the current business world (Singmaster &

Manise, 2014). No longer are employers and customers located within the same town, city, county, or even state (Singmaster & Manise, 2014). Often business and industry stretch across state lines and even international borders (Singmaster & Manise, 2014). Ruth Caplinger, the director for career and technical education at Mason County Schools in West Virginia, related an instance in her work history that portrays this facet of modern CTE training (Singmaster & Manise, 2014). While working in her former position as a registered nurse, Ms. Caplinger encountered a woman in labor who neither spoke nor understood English (Singmaster & Manise, 2014). None of the doctors or other nurses were able to speak or understand Spanish (Singmaster & Manise, 2014). Ms. Caplinger was able to draw on her previous Spanish courses in her high school study to help the patient feel at ease and more comfortable with the care she was receiving (Singmaster & Manise, 2014). Educators are aware that students now require multiple skills to address needs in today's workforce (Fala, Tully, ad Viviano, 2012)).

The question is then, what skills and dispositions are required of students in the global society? The Asia Society, in conjunction with the Council of Chief State School Officers, created a definition of global competence (Singmaster & Manise, 2014). This definition was then also adopted by the United States Department of Education (Singmaster & Manise, 2014). This definition included four main points:

1. Investigate the world. Global competence starts by being interested in learning about the world and how it works. Students ask and explore questions that are globally significant. They can respond to these questions by identifying, collecting and analyzing credible information from a variety of local, national,

> and international sources, including those in multiple languages. They can connect the local to the global.
>
> 2. Weigh perspectives. Globally competent students recognize that they have a particular perspective, and that others may or may not share it. When needed, they can compare and contrast their perspective with others and integrate various viewpoints to construct a new one.
>
> 3. Communicate ideas. Globally competent students understand that audiences differ on the basis of culture, geography, faith, ideology, wealth, and non-verbally, with wide-ranging audiences and collaborate on divers teams. Because it is increasingly the world's common language for commerce and communication, globally competent students are proficient in English, as well as in at least one other world language. They are technologically and media-literate within a global communications environment.
>
> 4. Take action. Globally competent students see themselves as capable of making a difference. Alone or with others, ethically and creatively, globally competent students can envision and weigh options for action based on evidence and insight; they can assess their potential impact, taking into account varied perspectives and potential consequences for others; and they show courage to act and reflect on their actions. (Singmaster & Manise, 2014, pp. 47-48)

What is important with this definition is not that it calls for a separate CTE class on global matters or content, but that it shows how all CTE programs should have interwoven within them a global perspective (Singmaster & Manise, 2014). This definition also closely aligns with the global skills developed by the Middle Bucks

Institute of Technology (Fala et al., 2012). Each program in vocational education must have relevance on an international venue.

Through a recent study, the Association of American Colleges and Universities found 96% of those surveyed from a group of business executives felt intercultural skills were important in their work (Singmaster & Manise, 2014). These skills included such items as being "comfortable working with colleagues, customers and/or clients from diverse cultural backgrounds" (Singmaster & Manise, 2014, p. 48). Another important focus is addressing what students should know in an international arena (Fala et al., 2012). In addition, 91% of the executives felt "all students should have educational experiences that teach them how to solve problems with people whose views are different from their own" (Singmaster & Manise, 2014, p. 48). Oftentimes, education focuses on everyone agreeing and coming up with the same answer (Singmaster & Manise, 2014). Intercultural and problem-solving skills require students to be able to think for themselves, voice their views or opinions, and work with others to find an agreeable solution (Singmaster & Manise, 2014).

The 2014 United States Business Needs Survey of over 800 U.S. executives in international business, sales, marketing, and finance resulted in similar results and views (Singmaster & Manise, 2014). Approximately 80% felt their overall business would increase if they employed people who had international experience (Singmaster & Manise, 2014). The researchers also discovered not only was this skill needed in management, but in entry-level employees as well (Singmaster & Manise, 2014).

While these study results paint a picture of a definite need for an international component in CTE education, the reality is that this is not an easy need to fill (Singmaster

& Manise, 2014). In the United States, a battle continuously fought is to show relevance of the CTE programs and to portray these programs will lead to a worthwhile future as compared to a college education (Singmaster & Manise, 2014). Resources are few, however, when it comes to training students for international work (Singmaster & Manise, 2014). Global exposure is very limited among U.S. students (Singmaster & Manise, 2014). Many high school students do not study a foreign language, especially to the point of becoming proficient (Singmaster & Manise, 2014). In addition, less than one percent of K-12 students in the U.S. are able to experience study abroad where they can be exposed to different cultures and people with different backgrounds for the purpose of widening their perspectives (Singmaster & Manise, 2014). With such a small number of students thus exposed, it is a small wonder educators are having difficulty integrating these competencies of global skill into curriculum (Singmaster & Manise, 2014).

Some examples of teachers who have been successful at integrating global aspects into their curriculum do exist (Singmaster & Manise, 2014). There are a number of methods to begin engaging CTE students with global competence (Singmaster & Manise, 2014). However, the classroom environment and implementation of strategies are constantly evolving (Fala et al., 2012). One key is to begin with a small piece of international exposure within an existing curriculum (Singmaster & Manise, 2014). By doing this, a teacher can build confidence in the addition and set aside time for any necessary research, training, or professional development (Singmaster & Manise, 2014).

Other strategies were introduced as well. One of these included using world exchanges to foster changes in curriculum (Singmaster & Manise, 2014). Another strategy involved reaching out to local businesses, universities, and non-profits with

international ties and resources (Singmaster & Manise, 2014). This might include guest international speakers. Some organizations that may already include this would be Rotary Club, Kiwanis Club, or area chambers of commerce (Singmaster & Manise, 2014). Lastly, schools may use global issues and set forth access to critical language study to get ready for the international market and economy (Singmaster & Manise, 2014). These steps will result in a workforce that is prepared for the 21st-century global demands (Fala et al., 2012).

Through the integration of global competencies into a regular CTE curriculum, the teacher uses another tool to spark interest in the students (Singmaster & Manise, 2014). Additionally, the students will be more engaged by the broader picture of their future careers (Singmaster & Manise, 2014). This will only enhance the students' preparedness for their future careers (Singmaster & Manise, 2014).

Another example of successful CTE programs is found in Spring Valley High School in Huntington, West Virginia (Peckham, 2014). This program uses real-world situations by having students work in school-based businesses (Peckham, 2014). Students function as employees, and their grades reflect their performance while working (Peckham, 2014). Currently, the school has three businesses running (Peckham, 2014). The carpentry program supports Timberwolf Construction, while the engineering program runs the Valley Project (Peckham, 2014). Another program is run by the Junior Reserve Officer Training Corps program (Peckham, 2014). Students go through many real-life work experiences such as interviews at the beginning of the semester, clocking in and out of work, and following current safety standards (Peckham, 2014). According to

one administrator with the district, the program is helping attendance, because the students are held accountable for being present to work (Peckham, 2014).

Spring Valley High School also recognizes the need for early decision making when it comes to career choice (Peckham, 2014). The school uses two- to five-week sessions where ninth-grade students can sample the different CTE programs offered at the high school (Peckham, 2014). Programs available include carpentry, engineering, hydraulics and pneumatics, industrial motor controls, welding, automotive, and industrial maintenance (Peckham, 2014). This allows students to begin thinking about what career choices they want to explore and begin their high school schedules with that in mind (Peckham, 2014). Also, to promote student thinking on future careers, the region sends middle school students to visit the high schools they will attend to view CTE programs within which they might have an interest (Peckham, 2014).

These efforts are important, because many students who begin a four-year college program do not finish (Peckham, 2014). Kathy D'Antoni, assistant superintendent for the West Virginia Department of Education, stated:

> About 70% of our students who go to four-year institutions don't finish. College is a powerful tool to have in your toolbox, but if you don't know what you want to be doing or how to get there, it's not a very valuable tool. Students in seventh, eighth, and ninth grades should be finding out what they like to do, find their talents, and start building on those talents. (Peckham, 2014, p. 4)

This is true not only in West Virginia, but similar results can be seen across the United States.

Inclusion

Until recently, success of a student in vocational coursework was a result of that student finding employment in that field of study (Tkaczyk, 2015). That is no longer the case (Tkaczyk, 2015). Now those same students must be successful not only in the skills learned in the CTE coursework, but also in the academic skills required by today's standards (Casale-Giannola, 2012). While there is a large amount of research showing the difficulties students with disabilities face during inclusion in a regular classroom, there is very little research designated toward that same student when entered into inclusion within a vocational program (Casale-Giannola, 2012).

When looking at inclusion of students with disabilities within a CTE program, it is important to understand the type of instruction given within this inclusive environment (Casale-Giannola, 2012). For example, CTE programs usually allow students to use various learning styles and academic abilities that show their strengths (Fala et al., 2012) One study involved examination of three questions in regard to this subject (Casale-Giannola, 2012). These included the following:

1. What are the strengths and weaknesses of inclusion academic classes in the vocational secondary school?
2. What are the strengths and weaknesses of the inclusion vocational classes in the vocational secondary school?
3. What are the unique elements of the vocational secondary community that support or hinder success of special education students in the inclusive setting? (Casale-Giannola, 2012, p. 27)

These questions will help further understanding of the particular type of instruction administered within an inclusive environment (Casale-Giannola, 2012).

Within this study, Casale-Giannola (2012) examined two different vocational career centers that accepted students from other areas, much like in this research. Career and technical education inclusion observations involved classes taught in web design, horticulture/floriculture, cosmetology, business technology, electronics, carpentry, public safety, performing arts, geographic information systems, information technology, and supermarket careers (Casale-Giannola, 2012). In addition to observation, an open-ended survey was used (Casale-Giannola, 2012). This survey asked teachers at the two different vocational/technical high schools to identify the strengths and weaknesses of an inclusive environment (Casale-Giannola, 2012). All surveyed teachers were currently teaching within an inclusive environment (Casale-Giannola, 2012). Finally, consultation meetings were held with educators to gather more information (Casale-Giannola, 2012). Three data sources in total were used to compare the strengths and weaknesses of inclusion in career and technical education courses (Casale-Giannola, 2012). These sources included observation, consultation, and surveys (Casale-Giannola, 2012).

Casale-Giannola (2012) found four strengths that were noted in the order of the most observed or reported. These included meaningful teacher-student relationships and rapport, real-life connections to lesson content and intriguing discussion, motivating students through active-learning and multi-learning modalities, and good collaboration between co-teachers (Casale-Giannola, 2012). When discussing meaningful teacher-student relationships and rapport, the researchers found when teachers created a respectful and good rapport with the students, those students in turn performed well

(Casale-Giannola, 2012). Further, a positive result was seen when teachers shared real concern, interest, and respect for those students (Casale-Giannola, 2012). Positive results are also shown when teachers actively convey interest in the content to the students (Moscon & Thompson, 2013).

Another strength occurred when teachers made real-life links to curriculum and when discussion became intriguing (Casale-Giannola, 2012). Often, instructors use standard lecture and discussion techniques in an academic inclusive setting (Casale-Giannola, 2012). Individual students appeared to be involved and to perform well when topics discussed connected with the student's experience and curiosity (Casale-Giannola, 2012). Another strength involved the use of different modalities in learning to motivate the students and engage them in active learning (Casale-Giannola, 2012). Student learning preferences were adapted from lecture and discussion, and teachers utilized different approaches such as kinesthetic, auditory, and visual methods (Casale-Giannola, 2012). The "shelf life of traditional programs" has been largely decreased (Jackson, 2013). YouTube, books on tape, and hands-on exercises were used to support these different learning styles (Casale-Giannola, 2012).

Finally, good collaboration between co-teachers was found to be a strength (Casale-Giannola, 2012). As is often the case, free flowing communication and mutual respect were great examples (Casale-Giannola, 2012). When teachers were working together and communicating effectively with each other and with their students, student performance was seen to improve (Casale-Giannola, 2012). These are findings that strengthen the regular classroom and that might be missing from a non-inclusive environment for special needs students (Casale-Giannola, 2012).

In addition to strengths, there were weaknesses to inclusion that were found as well (Casale-Giannola, 2012). As in the case of strengths, these weaknesses or needs were listed in the order they were most observed or reported (Casale-Giannola, 2012). The most often observed or reported weakness was that teachers often lack necessary strategies (Casale-Giannola, 2012). This would include academic and special education teachers who do not have the repertoire of resources and strategies needed to assist students with disabilities in a classroom (Casale-Giannola, 2012). This does not mean teachers did not use any individual support strategies; however, they needed and wanted more of these strategies to work with each student's needs (Casale-Giannola, 2012).

Another weakness involved the fact students with disabilities often lack necessary skills (Casale-Giannola, 2012). Students often do not have basic skills in mathematics, writing, and reading to help them navigate through the content instruction within an inclusive classroom (Casale-Giannola, 2012). However, this is not a situation related only to students with disabilities (Jackson, 2013). The lack of these types of skills often limit students across the spectrum (Jackson, 2013). Due to this lack, these children often need remediation assistance and basic skills support to keep them function within the classroom (Casale-Giannola, 2012).

A weakness found among some of the teams involved a lack of co-teaching collaboration and co-teaching models (Casale-Giannola, 2012). Success was seen among some of the teams, and these groups were seen as working well together (Casale-Giannola, 2012). However, three of the teams did not show this result by a lack of communication and respect for each other within the co-teaching assignment (Casale-Giannola, 2012). Further, teachers did not always have the appropriate awareness of

special education (Casale-Giannola, 2012). Even though regular classroom teachers were aware of who the special education students were within their classroom, these teachers were not aware of special student classifications, special education laws, and needs of the students (Casale-Giannola, 2012). Not only that, but these teachers were also unaware of strategies that could have been used to support their students' learning (Casale-Giannola, 2012). This is another reason why students should be provided with opportunities throughout their education to develop necessary skills of becoming self-directed learners (DiMatiina & Ferris, 2013). Another weakness tied in with lack of teacher knowledge also involved how students were enrolled within different classes (Casale-Giannola, 2012). Oftentimes, complaints arose that special education students were unevenly sorted into different classes (Casale-Giannola, 2012).

A final weakness was identified as limits on student assessments (Casale-Giannola, 2012). In today's educational process, assessments play an important part. For the teacher to move on to new material, the teacher must first decide which students have learned the concepts and skills and those students who have not yet mastered the content (Casale-Giannola, 2012). This allows the teacher to determine what strategies and instructional methods to use in order for those who have not mastered the material to find methods to successfully master the content (Casale-Giannola, 2012).

Similar results were indicated when looking at inclusion within the vocational classes at a vocational secondary school (Casale-Giannola, 2012). The strengths included good use of differentiated instruction (Casale-Giannola, 2012). With vocational instruction, teachers were able to use a variety of instructional methods including different assignments for working cooperatively and as individuals (Casale-Giannola,

2012). This involves a key component of vocational education (Casale-Giannola, 2012). While there is a large amount of standard academic work that can be done, there is generally a great amount of hands-on practical application that can be injected into the curriculum (Casale-Giannola, 2012).

Another strength of inclusion in vocational instruction was the ability for students to make real-life connections (Casale-Giannola, 2012). Students worked on a variety of projects that injected real-life events such as catering, making flower arrangements, and creating lamps and shelves for community members (Casale-Giannola, 2012). This follows with the variety of instructional methods (Casale-Giannola, 2012). In addition to hearing or seeing a part of the vocational curriculum, students also utilized these skills to create a finished project or task (Casale-Giannola, 2012). Sometimes these skills can be enhanced through transition programs such as the Social Security Administration's Youth Transition Demonstration (YTD) project (Hemmeter, 2014). This program identified certain interventions that help improve educational and employment outcomes for youths between the ages of 14-25 (Hemmeter, 2014).

Repetition is also a strength of inclusive vocational classes in a vocational secondary school (Casale-Giannola, 2012). While repetition is an important part of the learning process, CTE courses often provide a longer class period in which essential skills can be repeated more often and more opportunities can be provided to work on specific tasks and skills (Casale-Giannola, 2012). Student retention is increased through the ability of the student to practice these newly learned skills and knowledge (Casale-Giannola, 2012).

Relationships are also a crucial part of the successful learning environment. For students to be successful in the CTE classroom, relationships are critical (Casale-Giannola, 2012). Often in the study by Casale-Giannola (2012), an association was found between student behavior and performance in connection with that student's respect for and relationship with the instructor. It was also found students will often choose a vocation based on their relationship with the teacher rather than their interest in the subject matter (Casale-Giannola, 2012).

One of the building blocks to creating successful teacher-student relationships was found in the last strength inherent in inclusion within vocational classes (Casale-Giannola, 2012). This includes teacher passion and expertise (Casale-Giannola, 2012). Particularly when a vocational teacher has worked within his or her field of instruction, this is seen more often (Casale-Giannola, 2012). These teachers often bring a sense of accomplishment and pride to their vocational classrooms (Casale-Giannola, 2012). Having worked in their fields before becoming a teacher, these instructors also bring interest, confidence, and a sense of pride in their workmanship and the successful workmanship that their students display (Casale-Giannola, 2012). These benefits a teacher brings to the classroom spotlight the need for increased availability for alternative certification (Fritsch, 2013). As in any curriculum, when a teacher has and exhibits a sense of enthusiasm and pride in the content, it becomes more appealing to the students within the classes (Casale-Giannola, 2012).

As a result of this research, Casale-Giannola (2012) made several recommendations to propose inclusion in CTE coursework. These recommendations included raising the amount of active learning in the regular academic setting, teachers

sharing basic skill support within all of the content curriculum sections, and increasing the teachers' repertoire of methods and adjustments that support students with disabilities' performance (Casale-Giannola, 2012). Other recommendations included maximizing co-teaching and collaboration between instructors and improving behavior regulation, along with community-building (Casale-Giannola, 2012).

Retention

Students who participate in career and technical education courses may be more likely to have an attachment to school than those who choose not to participate in such coursework (Plank, DeLuca, & Estacion, 2008). In a study by Plank et al. (2008), results indicated students entering high school at a young age showed a decreased likelihood of dropping out of high school when taking career and technical education courses. However, students entering high school at a higher than normal age showed little difference when taking career and technical education courses (Plank et al., 2008). A group that faces challenges in remaining in school could be described as vulnerable (Taylor, 2011). These are students who are either from low-income families or involved in some type of public social service program (Taylor, 2011). Additionally, students taking dual enrollment college courses during high school showed similar numbers in continuing college after graduation (Pretlow & Wathington, 2014).

Academic Indicators

Interest in vocational education is an important part of discussing the number of students choosing to participate in this pathway (Blackhurst, Auger, & Wahl, 2003). Students begin forming an interest in their chosen career paths as early as the middle school level (Blackhurst et al., 2003). In a survey of 119 elementary students, researchers

found that by fifth grade, students had developed a conceptual framework for comprehending vocational preparation requirements, but were not able to accurately put that framework into application for specific occupations (Blackhurst et al., 2003).

Another alarming result of this study showed that very few fifth graders identified technical education as a postsecondary alternative (Blackhurst et al., 2003). Many students realized some jobs required training or skills that were not associated with a four-year college; however, they could not make the connection needed to a postsecondary vocational education school (Blackhurst et al., 2003). The study also indicated students may begin changing their aspirations and expectations to a lower setting by the sixth or seventh grade (Blackhurst et al., 2003).

College readiness is also an issue (Archbald & Farley-Ripple, 2012). In an article in the *High School Journal,* from 2012, Archbald and Farley-Ripple (2012) reported studying predictors of placement when it comes to lower-level mathematics courses versus higher-level mathematics courses. The study involved examination of a district-level data set (Archbald & Farley-Ripple, 2012). The motivation of the research was based on the fact students who finish high school with lower-level courses are not ready for college-level work, and therefore, do not experience success (Archbald & Farley-Ripple, 2012). This lack of readiness is especially apparent in minority and low-income students (Archbald & Farley-Ripple, 2012). The main question asked during this study was "whether, at the transition into high school, race, or SES appears to influence course placements above and beyond the student's achievement record" (Archbald & Farley-Ripple, 2012, p. 10).

Career and technical education provides the answer to the question "why" (Heath, 2014). According to the Association for Career and Technical Education (ACTE) president Sarah Heath (2014), "45 percent of CTE students interested in a math career reported that their CTE courses help them attain higher math and/or science skills" (p. 6). As Heath (2014) noted, every student has a need for this academic knowledge and standards. Career and technical education provides an environment where students can apply this knowledge through real-world work experiences (Heath, 2014). This emphasizes the need for communication and collaboration between CTE instructors and core math, science, social studies, and language arts instructors (Heath, 2014). This will facilitate use of similar approaches to the teaching and utilization of current learning standards (Heath, 2014). Conversations regarding crosswalking of standards assists in reinforcing teaching and avoids repetition or confusion about the skills learned (Heath, 2014). This creates a positive atmosphere as well, due to teachers working together and respecting other peers' content areas (Heath 2014).

A possible success story in talking about crosswalking of standards would be the state of Tennessee (Gibney, 2014). As one of the first two states to receive funding from the Race to the Top initiative, Tennessee has made changes in CTE programs that are often overlooked (Gibney, 2014). It is estimated approximately 200,000 students take at least one CTE course every year in the state of Tennessee (Gibney, 2014). As it is so important, the state has made an intensive effort in braiding general education and CTE academic standards with technical skill attainment and 21st century skills (Gibney, 2014). Often there is a broad gap between general education and any type of CTE program (Gibney, 2014).

As a result, when a student walks into a CTE program in Tennessee, he or she may find it to look much like any other general education math or English class (Gibney, 2014). Tennessee has rewritten many of the state standards to become Common Core-aligned (Gibney, 2014). These standards are then embedded into subject-specific standards, and students taking CTE courses are required to meet a much higher level of academic performance and skill mastery (Gibney, 2014). These new standards are placing greater focus on literacy and mathematics in a technical environment (Gibney, 2014). The purpose is to simulate a workplace context to teach students that employees call on these skills regularly and use critical thinking to solve problems (Gibney, 2014). During the 2014-2015 school year, Tennessee had 117 new and revised CTE courses implemented (Gibney, 2014). All of these courses were aligned to the Tennessee State Standards (Gibney, 2014).

One question that may be asked is, how can it be known that these standards are actually taught to the students? This question was also examined by forty-two states in developing common career technical core standards (Green, 2012). This process began with intense training for both CTE instructors in combination with math and English peers (Gibney, 2014). This was done through statewide training and also required professional development on Common Core standards and the use of these standards to reach a higher depth of knowledge (Gibney, 2014). There were several reasons for this infusion. First, in Tennessee, CTE teachers are responsible for instructing students regarding standards for literacy within their CTE subjects (Gibney, 2014). This would include a subset of literacy and math which would be seen in the normal classroom activities (Gibney, 2014). This subset would show the concepts and learning framework

required by the state standards; however, it would be a part of the existing curriculum (Gibney, 2014).

Secondly, this method removed the need to have non-tested subject teachers try to teach with two sets of distinct standards when planning their daily lesson plans (Gibney, 2014). A successful CTE curriculum must blend "high-quality state and industry standards" with core standards in mathematics and literacy (Green, 2012, p.46). By incorporating Tennessee's literacy and mathematics standards throughout the existing CTE standards, the content became one group of standards that could be more readily taught to students (Gibney, 2014). Thirdly, this new system benefited the educator evaluation system (Gibney, 2014). By using these new seamless, combined standards, instructors could teach key state standards indicators like questioning and critical thinking (Gibney, 2014). This would enable teachers to not only teach their content, but also obtain more favorable evaluation scores on their teacher evaluations (Gibney, 2014). Finally, the combining of these Tennessee State Standards, CTE subject-specific standards, and general education subject-specific standards appeared to make common sense and streamlined the goals all stakeholders wanted to achieve (Gibney, 2014).

Student assessment in CTE programs is always challenging and sometimes is questioned by others in education (Washer & Cochran, 2012). Washer and Cochran (2012) discussed how CTE students perform in three different learning domains. These domains include cognitive (knowledge), psychomotor (fine/gross motor skills), and affective (appreciations, values) (Washer & Cochran, 2012). Washer and Cochran (2012) further discussed assessing students in each of these learning areas.

For cognitive assessment, teachers often resort to tests using true/false, multiple choice, or matching questions (Washer & Cochran, 2012). While often this is done as a means to save time for the teacher or person grading the test, it is not an accurate assessment that will mirror how students will perform in their chosen industry or profession (Washer & Cochran, 2012). These test-type items may have a place in the assessment; however, Washer and Cochran (2012) suggested higher-level assessments using writing and public speaking activities would more closely resemble a student's mastery of content at a level that would be employed in an actual work site. These elements would actually be utilized if a student were explaining procedures to a patient's family, completing a chart documenting work done on a shift, or completing a work order (Washer & Cochran, 2012).

Teacher and Student Relationships

The aspect of teacher and student relationships holds a positive place in CTE coursework, but also carries with it an enormous expectation on vocational instructors (Casale-Giannola, 2012). As stated in the study by Casale-Giannola (2012), meaningful student-teacher relationships was one of the main five strengths of inclusion within a vocational class. Student behavior and performance were closely tied to a student having respect for and relationships with their instructors (Casale-Giannola, 2012). One aspect to build this relationship on is a well-trained teacher who has had rigorous professional development (Fritsch, 2014). As is the case both in vocational programs and in regular academic classrooms, a student's choice of a particular vocation may not come from interest in a particular subject or type of work, but the influence or preference of a particular teacher (Casale-Giannola, 2012).

One of the most important aspects or benefits of CTE programs is that students are learning real-life skills and knowledge (Fritsch, 2013). This is especially evident when teachers come from a particular work force that utilizes the skills and knowledge taught in a particular CTE program (Fritsch, 2013). Not only do these teachers bring a wealth of practical knowledge and experience, but often they also bring a love or enjoyment from having practiced in their fields (Fritsch, 2013). Teachers who come to education from business and industry "are able to draw connections between academics and commerce, between theory and application. They make learning meaningful for their students through authentic problem-solving scenarios" (Moscon & Thompson, 2013, p. 19).

Henry Paris was an example of this facet of CTE programs (Fritsch, 2013). Paris was a successful farmer for over 30 years and was involved in many aspects of farming life (Fritsch, 2013). Cattle production, feed distribution, and trucking were all included in his business life for that period of time (Fritsch, 2013). Instead of retirement, Henry chose to pursue a career as an agriculture education teacher (Fritsch, 2013). Paris, who was a parent leader with 4-H and livestock showing for years through his children said, "I really missed the involvement with young boys and girls" (as cited in Fritsch, 2013, p. 31). Paris continued to say, "I got to thinking about what else I could do, and [so I] checked with the Department of Education in Virginia" (as cited in Fritsch, 2013, p. 31). Currently, Paris is in his 11th year of teaching and has built a strong agriculture program in the Powhatan Junior High School in Powhatan, Virginia (Fritsch, 2013).

While the numbers are still small in comparison, the percentage of alternatively certified teachers or teachers who spend their careers in other professions prior to

attaining their teaching certification are an integral part of the agricultural education profession (Fritsch, 2013). According to Rebekah Epps, an assistant professor of agricultural education for the University of Kentucky, the number of teachers in the United States currently teaching agricultural education who did not major in agricultural education is between 15% and 20% (Fritsch, 2013). Epps directs the university's masters with initial certification program (Fritsch, 2013). Many universities use this program to help industry professionals obtain teaching certification in agriculture education (Fritsch, 2013).

Not all teachers have to leave their profession (Moscon & Thompson, 2013). Some teachers come from companies such as CH2M Hill and Hewlett Packard (Moscon & Thompson, 2013). Engineers from these companies take time to work with students so that they have access to "current research, maps, surveys, and actual projects" (Moscon & Thompson, 2013, p. 18). This collaboration enhances the effectiveness of the CTE program by fostering student professionalism and providing an authentic experience (Moscon & Thompson, 2013).

Why do people leave employment in the agriculture industry? Many would say a person must want to be a teacher (Fritsch, 2013). Many who make the switch to teaching end up with longer working hours and less pay (Fritsch, 2013). Chad Burkett, an agriculture teacher in Springdale High School in Springdale, Arkansas, said, "I woke up one morning and I wanted to look at the big picture. What lasting impact do I want to have? How do I want my family to be raised? I wanted to give back" (Fritsch, 2013, p. 32). Not only does this fill a needed lack of educational professionals in the agriculture field, but it also places professionals who love their chosen field in classrooms where

they can impart that love and knowledge to students (Fritsch, 2013). This problem includes many other professions as well. Accounting teacher shortages have also been addressed by the American Accounting Association (Barry, 2012). Not only does this work address the shortage of accounting professionals, but also the shortage of tenure track accounting educators (Barry, 2012).

One of the key differences with this type of certificated teacher is the training to begin work (Fritsch, 2013). Several instructors noted in industry work, they were taken to the particular areas they would be responsible for and trained in all aspects (Fritsch, 2013). A disconnect for teachers who come through a standard education program is that they may receive student teaching training at one school and then go to work in another (Fritsch, 2013).

On a national scale, agriculture educators are in high demand within the United States (Fritsch, 2013). While the demand varies from state to state, the requirements for certification to teach also vary (Fritsch, 2013). In Montana, a bachelor's degree is not required if a person can provide documentation of at least 10,000 hours of work experience in CTE areas with certain needs (Fritsch, 2013). These are categorized in a system called Class 4 (career and technical) (Fritsch, 2013). As an agricultural education specialist in Montana's Office of Public Instruction said, "It's not my first choice, but I'd much rather have somebody in place with a Class 4 endorsement than not be able to offer an ag program" (Fritsch, 2013, p. 32). Missouri has similar standards for CTE instructors that guide high schools and career centers across the state (MODESE, 2015c).

These examples of people leaving the agriculture industry to become teachers are not unique success stories (Fritsch, 2013). This then leads to the question, should all

teachers in agriculture education be required to work in the industry first? According to Lori Bennett, that is exactly what should be done (as cited in Fritsch, 2013):

> If I hadn't been in industry, I wouldn't have really been able to help them make better purchasing decisions, or find the right thing for their home, or help them with plans. It really gave me a leg up because I lived it, and I think that's what most people who are starting to teach in their 20's don't have. (p. 33)

This is a great example of experienced industry personnel imparting work experience into the classroom (Fritsch, 2013).

Negatives with this approach also exist (Fritsch, 2013). Such an array of different opportunities exist within agriculture that students might go into one area of work experience, go into the classroom, and then enter a teaching field in a totally different subject (Fritsch, 2013). As Epps stated, "If we aren't preparing these students for the industry and industry standards, then why are we teaching?" (as cited in Fritsch, 2013, p. 33). While these accounts represent agriculture education, the same principles could apply across several, if not all, CTE programs (Fritsch, 2013). Business, computer design, family and consumer science, welding, machining, auto body repair, and many more can have a much greater impact on student success when the teaching is led by someone with experience in applying this knowledge and these skills in real-life work (Fritsch, 2013).

Choice Between Vocational Education and a College Degree

Other research also indicates success by building a culture of college and career readiness (Newell, 2013). Postsecondary educational attainment is often associated with expectations by parents, teachers, and even students while in high school (Sciarra &

Ambrosino, 2011). In an article entitled,"Building a Culture of College and Career Readiness," Eugenia Newell (2013) looked at a new school located in Tulsa, Oklahoma. The Will Rogers College High School (WRCHS) opened to students in the fall of 2011 (Newell, 2013). One of the key components of the new school was the accessibility of college courses to the school's juniors and seniors (Newell, 2013). Students could take up to six credit hours of college classes each semester beginning their junior year (Newell, 2013). This was accomplished through a partnership with Tulsa Community College (Newell, 2013). Students were chosen first from the geographical boundaries of the school and then by lottery from the surrounding four areas (Newell, 2013). The eligibility of a student was determined only by agreeing to the program and any interventions recommended (Newell, 2013).

The success of the program is dependent on staff members who serve as advisors to the students (Newell, 2013). Weekly meetings with advisors give the students the opportunity to go over graduation requirements; career, academic, and social development; and test-taking strategies, essential vocabulary, and critical-thinking skills (Newell, 2013). A survey containing six questions was given to students regarding their participation in the advisory program (Newell, 2013). These included the following:

1. Has any teacher talked to you about your career interests?
2. Has a teacher or counselor discussed with you the exact requirements and courses needed to graduate from high school?
3. Has a teacher or counselor discussed with you the requirements necessary to attend college, technical programs, or the military after high school graduation?

4. Has a teacher or a counselor suggested that you list all your school, community, or church activities, including clubs, sports, honors, certificates, and leadership roles?
5. Have you completed a plan of study?
6. Do you have a relationship with an adult at your school with whom you can talk about your future? (Newell, 2013, p. 45)

With 60% of the junior class enrolled in the concurrent program, another 15% participating in Tulsa Technology Center's tech programs, and the other juniors in some type of Advanced Placement course, the school has 100% of the junior class involved in a college or career readiness program (Newell, 2013).

Another amazing result of the new school is parent participation (Newell, 2013). In the spring of 2012, conferences were held with parents to ensure they understood what the graduation requirements would be for students attending the WRCHS (Newell, 2013). Eighty-one percent of parents were shown to have attended the conferences (Newell, 2013). Of these attendees, 99% of parents surveyed said they understood the graduation requirements at WRCHS, and 99% said they understood why their children made the decision to enroll at this school (Newell, 2013).

An interesting facet of secondary CTE programs is the use of Programs of Study (POS) (Alfeld & Bhattacharya, 2012). Programs of Study was one of the more prominent programs brought about by the 2006 reauthorization of the Perkins legislation (Shumer & Digby, 2012). A program of study is a collaborative effort among secondary educators, post-secondary educators, business, and industry (Alfeld & Bhattacharya, 2012). In Missouri, for example, these programs must align to current state standards and involve

skill and knowledge, which can be validated by industry advisory councils (MODESE, 2015a).

One study conducted regarding mature POS included examination of the success of three different schools with POS in their systems (Alfeld & Bhattacharya, 2012). These three different schools were chosen based on a strong consistency of students within their respective CTE programs moving on to college (Alfeld & Bhattacharya, 2012). This was indicative of an already strong partnership with a particular community college, which served as an anchor to the high school CTE and POS (Alfeld & Bhattacharya, 2012). The three schools were also demographically, geographically, and programmatically diverse (Alfeld & Bhattacharya, 2012).

The researchers conducted both observations and interviews with college and high school administrators and faculty (Alfeld & Bhattacharya, 2012). Some of the findings included that these mature POS sites had overcome certain barriers by being in existence for at least nine years (Alfeld & Bhattacharya, 2012). In addition, three other findings were significant. First, necessary resources were provided for teachers to create and maintain POS partnerships with high schools (Alfeld & Bhattacharya, 2012). Second, each POS site had very involved industry and business groups that served on advisory boards (Alfeld & Bhattacharya, 2012). And finally, each of the POS schools had individually created and flexible programs for dual enrollment on their campuses (Alfeld & Bhattacharya, 2012).

Some weaknesses were also found within these POS sites (Alfeld & Bhattacharya, 2012). By studying the qualitative and quantitative data, it appeared the high school guidance counselor role could have been improved (Alfeld & Bhattacharya, 2012). In

addition, the systems using data for the purpose of tracking students across educational levels were not very well coordinated (Alfeld & Bhattacharya, 2012).

In this study, both high school and college transcripts were collected for the purpose of tracking the postsecondary paths taken by students enrolled in a particular POS (Alfeld & Bhattacharya, 2012). After analyzing these transcripts, researchers were able to determine how closely students followed the same track after graduation (Alfeld & Bhattacharya, 2012). One of the weaknesses of this approach was that data were not always available if it was not required for the administrators to report this information (Alfeld & Bhattacharya, 2012).

A crucial element that must be a part of these programs is the evidence of connecting academic, technical, and employability knowledge (Moscon & Thompson, 2013). This has been a source of contention from policymakers recently (Moscon & Thompson, 2013). When these different knowledge aspects are combined effectively, a POS is going to see more success in the education of students (Moscon & Thompson, 2013).

Along with these data, student surveys were also collected from juniors and seniors participating in the POS (Alfeld & Bhattacharya, 2012). Several key items were discovered:

1. Only about half (32 percent) of the 219 students surveyed reported that their high school POS was the one in which they were most interested.
2. Most (63 percent to 84 percent) agreed or strongly agreed that being in a POS made them more engaged in school and in preparing for a career.

3. 81 percent agreed or strongly agreed that their POS "made me focus my studies so I know where I am headed."

4. High school participants tended to discuss course planning most frequently with friends (96 percent), compared to parents (90 percent), teachers (83 percent), and guidance counselors (61 percent).

5. Parents were rated most helpful in course planning (31 percent, compared to friends at 18 percent); more students reported "no one" (21 percent) as being helpful over guidance counselors (17 percent) or teachers (13 percent).

6. Only 32 percent had participated in a meeting with a parent and a counselor together regarding course planning.

7. For the 61 percent of students who reported participating in work-based learning (e.g., internship, job shadowing, community service), less than one-third (30 percent) considered these experiences to be closely related to their future career.

8. Even fewer students (21 percent) reported that their paid jobs were at least somewhat related to chosen careers.

9. Students' high school transcripts indicated that at the River College site, eight students (17 percent of that sample) had earned a certificate in their POS area by the end of high school. (Alfeld & Bhattacharya, 2012, p. 34)

In addition to this information, the researchers also tracked whether the students went to college to pursue their previously chosen POS (Alfeld & Bhattacharya, 2012). The researchers found of the 219 students, 73 (33%) attended the same college the POS was originally working with in their program (Alfeld & Bhattacharya, 2012). Of this group of

33%, only 33 students (45%) remained in the same POS they began in high school (Alfeld & Bhattacharya, 2012). This resulted in only 15% of the total participants continuing within the same POS they started and remaining with the same college (Alfeld & Bhattacharya, 2012). The remainder of the students fell into one of three categories: did not go to college at all, went to other colleges, or went to the first affiliated college, but did not remain in the same POS area (Alfeld & Bhattacharya, 2012).

Even though these findings may sound like there is a very weak correlation between a POS and the future postsecondary experience, the researchers also found students in a mature POS were more likely (29% to 17%) to say they felt "very prepared" for college (Alfeld & Bhattacharya, 2012). Likewise, 75% of students surveyed within the college programs felt their CTE program training was a help in their decision to attend college after high school (Alfeld & Bhattacharya, 2012). As a result, these findings support the concept POS have the ability to create more pathways or possible futures for students (Alfeld & Bhattacharya, 2012). By entering and completing a POS, students have many possibilities and choices available and visible to them of future careers (Alfeld & Bhattacharya, 2012).

College and Career Readiness

What defines college and career readiness? What measures are used to ascertain if high schools and secondary vocational schools are preparing students to see success in college or the specific careers those students have prepared for in their training? When writing the Common Core standards, the question changed from, "what students should know" to "what do students need to know in order to be successful in college" (Haycock, 2010. p. 15). Community colleges have an open-access agenda that often is not able to

keep students through completion (Bragg & Durham, 2012). There is also a large gap between GED programs and CTE programs designed for employment (Mageehon, 2013). Bridge programs which connect adult basic education with community colleges help with this problem some ("Promoting College Career Readiness," 2012).

Kentucky has seen some recent work on defining what is necessary to be college and career ready (Stone, 2012). Beginning in 2009, the Kentucky State Board of Education , the Kentucky Department of Education , and the Kentucky Council for Postsecondary Education developed a new system backed by legislative mandate that held schools accountable for college and career readiness in their systems (Stone, 2012). The problem with this system was that it counted only those students who were college ready and went no further (Stone, 2012). At the same time, the Division of Career and Technical Education was eliminated, with staff moved to the College and Career Readiness Branch of the Division of Curriculum (Stone, 2012). Harsh reactions and letters to the commissioner of education generated response (Stone, 2012). The commissioner took almost immediate action and asked the Kentucky Association for Career and Technical Education for assistance in creating a definition of career readiness (Stone, 2012).

To take on this task, a board of stakeholders from many areas of CTE in Kentucky came together to form an ad-hoc committee (Stone, 2012). This was done while not all agree that a separate definition must exist (Jackson, 2013). According to Kevin Baird, chairman of the Center for College and Career Readiness, "We must accept that there is no significant difference between 'college readiness' and 'career readiness' (Jackson, 2013, p. 40). However, the committee met and established the some of the following

guiding principles (Stone, 2012). First, although there are many similarities between college readiness and career readiness, there are also some significant differences (Stone, 2012). They are two very different concepts (Stone, 2012). Second, there is a very real difference between the concept of being job-ready (entry-level) and career-ready (Stone, 2012). Thirdly, the meaning of career readiness must contain the necessary parts of knowledge, aptitudes, and skills required for a student to be considered career-ready (Stone, 2012). Fourthly, it must be realized a student can fall under three different classifications (Stone, 2012). Each one may be career-ready, college-ready, or both college- and career-ready (Stone, 2012). Finally, it must be acknowledged college readiness should be defined as much more than test scores such as ACT scores (Stone, 2012). Students must also have the capability to make application of knowledge to real-life situations (Stone, 2012).

By applying these guiding principles, the committee was able to meet and devise a proposal to present to the commissioner for review (Stone, 2012). By the commissioner's reaction, he indicated surprise at the quality and professionalism of the proposal (Stone, 2012). The KACTE's definition contained three main elements (Stone, 2012). First, students must have a high degree of preparedness in core communication and mathematics (Stone, 2012). This will allow students to function and succeed in the workplace, the classroom, or in typical daily activities (Stone, 2012). Secondly, the definition must contain technical and job-specific skills that match up with a specific career (Stone, 2012). It must also provide life-sustaining income and room for advancement (Stone, 2012). Finally, the definition must include employability skills

which include personal responsibility and critical thinking (Stone, 2012). These are skills necessary regardless of what career area a student may choose to enter (Stone, 2012).

The Kentucky Association for Career and Technical Education wrote in their report:

> An educational system assessing accountability for both college and career readiness offers all students an opportunity to succeed in the ultimate goal of attaining a self-sufficient life. KACTE offers (the proposal) hoping the definition of career readiness, guiding principles, and recommendations for assessment and implementation contribute to development of an accountability system measuring students' achievements toward college, work, and life. (Stone, 2012, p. 33)

This illustrates the cooperative effort placed in combining two previously competing goals (Stone, 2012). Ensuring "academic competence is vital to preparing students for the careers of today and tomorrow" (Jackson, 2013, p. 41).

In addition, KACTE proposed three categories that contained accountability measures (Stone, 2012). For a student to be deemed career-ready, that student has to attain at a minimum one measure in each of the three categories (Stone, 2012). The categories included the following:

1. Technical skills—industry certifications or KOSSA (Kentucky Occupational Skill Standards Assessments).
2. Academic proficiency skills in communications/math—ACT, COMPASS (a college entrance test), KYOTE (a Kentucky college entrance test), ASVAB, or WorkKeys/National Career Readiness Certificate (NCRC) in applied math, locating information and reading for information.

3. Employability skills—ASVAB, WorkKeys/NCRC in listening and teamwork, or NOCTI-Job Ready. (Stone, 2012, p. 34)

These skills all go together with the idea each student has a career in mind, and he or she is making progress toward that goal (Stone, 2012). With this goal, an individual learning plan is also developed (Stone, 2012).

Along with these changes, the Kentucky State Board of Education ruled if a student achieved college- and career-readiness, the school in which the student is enrolled could gain a half a point on the accountability calculation (Stone, 2012). This action raised the visibility and importance of career readiness across the state (Stone, 2012). These measures adopted by the Kentucky Board of Education included the following:

1. College-readiness measures—ACTE, COMPASS, KYOTE.
2. Career-readiness academic measure if a student fails any of the three college-readiness measures—ASVAB, ACT WorkKeys in applied math, locating information, reading for information (silver level).
3. Career-readiness technical measures—KOSSA, industry certifications. (Stone, 2012, p. 34)

These measures helped ensure schools were recognized for this achievement and also highlighted the educational success CTE students were achieving (Stone, 2012).

The Kentucky Board of Education also stated very strong support for the individual learning plan in the CTE proposal programs (Stone, 2012). This support from the Kentucky Board of Education was essential in furthering these programs (Stone, 2012). While it is not possible to state the progress these steps have made, there is

evidence more emphasis has been placed on CTE coursework across Kentucky (Stone, 2012).

With the use of technology accelerating the speed of change in industry, employment opportunities that were at one time manual labor have now become highly technical (Jackson, 2013). With this in mind, students, regardless of what career they are entering, must be prepared academically, particularly in STEM subjects (Jackson, 2013). According to Baird, "We must accept that there is no significant difference between 'college readiness' and 'career readiness,' and we must therefore increase high school course work to a level of expectation that approaches college-level requirements" (as cited in Jackson, 2013, p. 40).

For example, according to Metrametrics, an education research organization, farming now requires higher-level academic skills than do many other employment opportunities (Jackson, 2013). Farmers are realistically CEOs of their businesses (Jackson, 2013). Therefore, they must have an in-depth understanding of difficult legal and financial material and genetically modified crops, and they must also have skill at using chemistry for crop selection, rotation, and fertilization (Jackson, 2013). In addition, farmers must now have skill at running very high-tech machinery and technology (Jackson, 2013). An example of this is found with the new John Deere farming equipment (Jackson, 2013). This equipment uses global positioning systems and advanced probes to guide seed planting, soil moisture, and nutrient requirements (Jackson, 2013). Also, according to Baird, while some policymakers try to differentiate between "knowledge workers" and "manufacturing labor," employees in today's

employment marketplace must be able to do many different tasks such as operating complex robotics and other high-tech equipment (as cited in Jackson, 2013, p. 40).

Do CTE programs taken at the secondary level have an impact on what pathway a student enters after high school? This is a question discussed in an article by Richard Arum and Yossi Shavit (1995). According to Arum and Shavit (1995), there are six ways vocational education inhibits additional educational progress. One way is that vocational programs utilize a much more stringent curriculum (Arum & Shavit, 1995). Therefore, it makes it much more unlikely for students to take an advanced course in a core subject such as science or mathematics (Arum & Shavit, 1995). It is also important to note students are an integral part of the learning program (Arum & Shavit, 1995). Consequently, if a student takes classes with successful, high-achieving, and self-motivated students, then that student is more apt to succeed in academics (Arum & Shavit, 1995).

Another way, according to Arum and Shavit (1995), vocational education can inhibit additional educational progress is that often curriculum offered in CTE courses is at a reduced level when compared to more rigorous classes. Therefore, students taking those CTE courses will learn less (Arum & Shavit, 1995). Students who are placed within what is regarded as a lower academic pathway may also be led to feel less able than other students (Arum & Shavit, 1995). Many times, schools make the mistake of placing teachers who are less experienced and less effective within these lower-track courses (Arum & Shavit, 1995). Finally, it is also understood tracks not intended for college-entry level will not help students prepare for entry into such education (Arum & Shavit, 1995).

Another interesting conclusion by Arum and Shavit (1995) was that students who come from lower social strata generally do not receive college preparatory coursework. The difference between the terms college and career is discussed in a study by David Conley and Charis McGaughy (2012). According to Conley and McGaughy (2012), discussion over the difference needs to go back to the early 1900s. At that time, high schools divided students into groups of college-bound students and vocational students (Conley & McGaughy, 2012).

During the 1990s, many states set up educational standards that defined what students needed to know, but what these standards failed to do was differentiate what constituted career readiness from college readiness (Conley & McGaughy, 2012). In 2003, the Association of American Universities sponsored the creation of standards in regard to what students needed to know when they began their college careers (Conley & McGaughy, 2012). These standards were defined by 400 faculty members of leading U.S. universities (Conley & McGaughy, 2012). Later studies showed standards did overlap or were comparable with some differences (Conley & McGaughy, 2012). Conley and McGaughy (2012) studied the requirements students faced when they entered a wide range of postsecondary courses. The researchers then identified standards necessary for success in those courses (Conley & McGaughy, 2012).

In their research, Conley and McGaughy (2012) found college and career readiness share some similar key elements; however, they are not the same (Conley & McGaughy, 2012). Skills such as "study skills, time management skills, persistence, and ownership of learning" are all skills needed in both directions a student may choose (Conley & McGaughy, 2012, p. 31). The Career Readiness Partner Council also states

that “learning needs to be delivered by a cadre of experts that includes teachers and career professionals” (Moscon & Thompson, 2013, p.20). However, content associated between college and career readiness often differed between the two concepts (Conley & McGaughy, 2012).

Conley and McGaughy (2012) suggested steps schools can take to accommodate students for both college and a career. One of those is to establish a college- and career-ready culture within the school and the surrounding community (Conley & McGaughy, 2012). This requires all adults in the system, including staff, parents, and business leaders, know and understand the school’s mission is geared toward college and career readiness (Conley & McGaughy, 2012). Adults deliver this message by holding high expectations and using phrases such as “when you go to college” to emphasize it is assumed those students will enter some type of postsecondary college path (Conley & McGaughy, 2012, p. 31).

Another step is measuring what is important for success in both college and career (Conley & McGaughy, 2012). Often, these two criteria have very similar needs (Jackson, 2013). This can be done through a number of different methods (Conley & McGaughy, 2012). These methods include goal setting, progress monitoring, test-taking, note-taking methods, and more (Conley & McGaughy, 2012). Some courses utilize embedded assessments tied to college and career readiness (Conley & McGaughy, 2012). These assessments include extended essays, demonstrations, research papers, and investigations (Conley & McGaughy, 2012). Another benefit of this type of monitoring is that the grade of the student better reflects how prepared the student is for college success (Conley & McGaughy, 2012). The same could be implemented for career-oriented

classes by utilizing demanding projects and tasks that require use of specific skills (Conley & McGaughy, 2012).

Additionally, Conley and McGaughy (2012) suggested aligning all courses to college-readiness and career-readiness standards. Important skills such as study skills, time management, and goal setting would then be specifically taught and utilized (Conley & McGaughy, 2012). Every course, regardless of content or subject matter, should build core academic skills needed for postsecondary success (Conley & McGaughy, 2012). This is a concept that seems to have taken even more hold in the current educational standards (Conley & McGaughy, 2012). Much is focused on in today's educational discussion regarding cross-curricular skills and standards (Conley & McGaughy, 2012).

Other steps suggested by Conley and McGaughy (2012) included partnering with local higher education institutions and local businesses and being flexible yet targeted with personalized goals for each student. Some of these flexible skills include reasoning, problem solving, speaking, listening, reading informational texts, and writing in a variety of areas (Conley & McGaughy, 2012). These all are essential skills in both college preparedness and career training (Conley & McGaughy, 2012).

Conley and McGaughy (2012) went on to show examples of schools where students are prepared for either direction. One of the example schools was Polytech High School in Woodside, Delaware (Conley & McGaughy, 2012). This high school utilizes five academies (Conley & McGaughy, 2012). While students train in a specific area and are working toward certification in a prescribed course plan, they also are able to work toward college preparation by taking advanced placement courses (Conley & McGaughy, 2012). The system comes with an advisement system in which students meet with their

advisers at least four times a year to review their current plans and two-year post-high school plans (Conley & McGaughy, 2012). The results are very high with a 97% graduation rate in 2008 (Conley & McGaughy, 2012). In 2009, 70% of graduates went on to postsecondary education immediately (Conley & McGaughy, 2012).

Not all students are living in a successful environment. In a report roundup (Sparks, 2012), it was noted just over half, or 52%, of ACT test takers who would be first-generation college students failed to meet any of the ACT College Readiness Benchmarks. This is in comparison to 31% of all test takers (Sparks, 2012). This shows students who would be the first of their families to attend college are not as prepared as peers who already have college-educated parents (Sparks, 2012)). In addition to this, 9% of first-generation college students met all four benchmarks compared to 26% overall (Sparks, 2012)). These benchmarks are tied to a 75% chance students who attain them will receive a C or higher in college courses taken during their first year (Sparks, 2012)).

Closely tied to college readiness is measuring whether a student will succeed in that undertaking (Sparks, 2012). Many students enter college and are unable to complete even remedial-level mathematics courses (Bahr, 2013). Further, there is a difference between students pursuing an occupational associate certificate and students pursuing academic majors (Hirschy, Bremer, & Castellano, 2011). According to Sparks (2012), the National Assessment of Educational Progress (NAEP) may not be reliable for measuring whether a twelfth-grade student is ready for college, a career, or the military. In her study, Sparks (2012) found students who took the NAEP test and scored a proficient level were associated with an 80% probability of scoring a 500 out of 800 on the Scholastic Aptitude Test math portion. In reading, there was only a 50% chance of

scoring a 500 on the verbal test (Sparks, 2012). Results show the NAEP test has even less correlation to the ACT test due to the fact the content is not the same (Sparks, 2012). When studied with tests for careers that do not require a four-year degree, the governing board found there was even less overlap (Sparks, 2012).

In a 2010 article, "Reinventing the Federal Role in Education," the idea was expressed the U.S. Elementary and Secondary Education Act (ESEA) should be reauthorized and should include a shift in focus of educational accountability to career and college readiness (Prakken Publications, 2010). While changes have taken place since the writing of this article, the information within is still relevant (Prakken Publications, 2010). The article states the ESEA reauthorization should:

- Establish college and career readiness as the common goal for all students;
- Ensure meaningful accountability for high school outcomes designed around common indicators of college and career readiness and high school graduation;
- Replace the current flawed, one-size-fits-all school improvement process with requirements for state- and district-led systems that are differentiated and data driven, and prioritize addressing the lowest-performing high schools;
- Support strategies necessary to implement, high school improvement at a much larger scale, including district-wide efforts, maximizing the role of entities outside the school system with expertise to contribute;
- Build the capacity of the system to implement innovative solutions—bold approaches to teaching and learning, school organization, and system structure; and

- Provide new funding for the implementation of innovative solutions to address low-performing high schools. (Prakken Publications, 2010, p. 34)

With these changes, the ESEA would promote both career and college readiness.

These are followed by several goals that should be established (Prakken Publications, 2010). The first of these goals is that college and career readiness needs to be established as a common goal for all students in education (Prakken Publications, 2010). Students are entering a world where almost 90% of careers that see high growth and high wages require some type of post-secondary training (Prakken Publications, 2010). Current law leaves that up to the states and therefore goes against commonality (Prakken Publications, 2010). States should also be required to publicly declare the performance of their districts on college and career readiness (Prakken Publications, 2010). This requirement from the states should serve in place of the 100% proficiency statement in NCLB on performance testing (Prakken Publications, 2010).

Summary

Career and technical education plays an important role in the education of students within the United States and throughout the world (Van Houtte, 2005). Increasingly, the United States has continued to lag behind other developed countries in postsecondary achievement (Wachen, Jenkins, & VanNoy, 2011). School districts must look at resources used in CTE programs such as partnerships with local industry and the state department of education (Kreamer, 2014). As seen through examined evidence, CTE plays an important role in the successful postsecondary education and employment of students taking these courses (Kreamer, 2014). Each of the areas discussed shows the impact of CTE education on students' choices and options when entering college,

technical school, or postsecondary employment. In addition, best practices have been examined for presenting CTE education along with how to impact student choices after high school. With appropriate guidance, schools can greatly affect their students' success in careers and life (Kreamer, 2014).

In Chapter Three, the methodology for this study is described. Population and sample, instrumentation, and data collection procedures are presented. Also included are descriptions of the data analysis and ethical considerations.

Chapter Three: Methodology

Methods and procedures utilized in this study are outlined in this chapter to illustrate how these findings are useful and meaningful for School District A in addition to the other three districts examined within this study. The purpose and problem, rationale, research questions and hypotheses, research design, population and sample, instrumentation, data collection and analysis, and ethical considerations are further discussed within this chapter.

Problem and Purpose Overview

The purpose of this project was to generate information on the impact secondary-level vocational education has on post-secondary vocational training or career placement and success. This information will be utilized to determine the impact of vocational training on post-secondary success and to inform expansion of Career and Technical Education (CTE) offerings at School District A. The rationale for this project was to provide research on whether vocational education has a significant impact on student success after high school graduation in the form of continued vocational training, college placement, or career success.

Research questions. The following questions were used to determine whether having CTE in a secondary setting has a significant impact on post-secondary training, education, or career success:

1. What is the correlation between students who participate in career and technical education at the secondary level and postsecondary placement in college?

$H1_0$: There is no correlation between students who participate in career and technical education at the secondary level and postsecondary placement in college.

2. What is the correlation between students who participate in career and technical education at the secondary level and postsecondary placement in a related occupation?

H20: There is no correlation between students who participate in career and technical education at the secondary level and postsecondary placement in a related occupation.

3. What is the correlation between students who participate in career and technical education at the secondary level and placement in postsecondary vocational training?

$H3_0$: There is no correlation between students who participate in career and technical education at the secondary level and placement in postsecondary vocational training.

4. What is the correlation of all students who completed career and technical education courses and placement after graduation?

$H4_0$: There is no correlation between students who completed career and technical education courses and placement after graduation.

5. What is the difference between District A students who attended Career and Technical Education courses at District A and post-secondary placement versus District A students who attended Career and Technical Education courses at the Area Career Center and post-secondary placement?

$H5_0$: There is no difference between District A students who attended Career and Technical Education courses at the District A site and post-secondary placement versus

District A students who attended Career and Technical Education courses at the Area Career Center and post-secondary placement.

6. What is the difference between sending school district students from Districts B, C, and D who attended Career and Technical Education courses at Districts B, C, and D and post-secondary placement versus Districts B, C, and D students who attended Career and Technical Education courses at the Area Career Center and post-secondary placement?

H6$_0$: There is no difference between sending school district students from Districts B, C, and D who attended Career and Technical Education courses at Districts B, C, and D and post-secondary placement versus Districts B, C, and D students who attended Career and Technical Education courses at the Area Career Center and post-secondary placement.

Research Design

The research was based on quantitative archival data. The purpose of this study was to determine what effect taking CTE coursework in high school has on postsecondary outcomes. The data needed were obtained from four area high schools that send students to an area CTE center that offers additional CTE coursework not offered at the local schools. According to Fraenkel et al. (2015), "Quantitative data are obtained when the variable being studied is measured along a scale that indicates how much of the variable is present. Quantitative data are reported in terms of scores. (p. 188). Higher scores show more variable present than lower scores do (Fraenkel, 2015).

The variables within this research consisted of the CTE coursework taken by the students and the ending results of those students' choices after graduation. "An

independent variable is one that affects the dependent variable being researched and is contained in the research design so that the effect of the variable can be determined" (Fraenkel et al., 2015, p. 11). In this case, the independent variable was the CTE coursework taken and completed by the students while they were in high school. Students must take a minimum of three courses to be a CTE completer. These CTE completers took these courses from four different high schools within the two-county area, and all four of these area high schools sent some of their completers to the area vocational school at School District D.

The dependent variable in a study is a variable that is affected by the independent variable and is also known as an outcome variable (Fraenkel et al., 2015). The dependent variables within this study weree the resulting outcomes measured by postsecondary surveys completed by school staff for former graduating seniors approximately eight months after graduation from their respective high schools. These data are collected by all high schools for state reporting purposes (MODESE, 2015b). These resulting outcomes showwhether students attended college, technical school, military, CTE-related employment, or have not yet entered any of the previously mentioned outcomes.

Population and Sample

Archival, de-identified data were collected from four area school districts. Three of these school districts transport a portion of the students taking CTE courses to the fourth district, which hosts the Area Career Center. Each of the four districts is located within a two-county area. Each district also conducts CTE courses such as agriculture, business, and family and consumer science at the home district. Data were collected using post-graduate survey information assessing what each school's CTE completers were doing approximately six to eight months after graduation. The four districts ranged in size from 104 to 431 students in grades nine through 12. School District A contained 104 students. School District B contained 109 students. School District C contained 202 students. School District D contained 431 students.

Data were extracted from the years 2011, 2012, and 2013. Approximately six months after graduation, matriculated former CTE students were asked to answer questions on a follow-up survey for data collection (MODESE, 2015b) (see Appendix A). This data collection is required each year by the MODESE (2015b). The sampled students for this study, 549 students, revealed whether they were in college, had obtained career placement, had joined the military, or were in no area associated with their CTE training. Descriptive statistics were used to "describe the information contained in multiple scores" using a mean (Fraenkel et al., 2015, p. 187). Thus, percentages for each category from each sampled school district could be compared.

Instrumentation

The four high schools were selected based on their connection to the Area Career Center. Once IRB approval was given by Lindenwood University (see Attendix B), telephone calls were made to the superintendents of the area schools and to the school board president of School District A for the purpose of describing the study and identifying data that would be sought. Letters were mailed to the superintendents of participating Districts B, C, and D, as well as the board president of School District A, to obtain written permission to access the data (see Appendix C). On obtaining the permission letter and a contact to retrieve the data, a request was made by email to the maintainer of records at each school for follow-up surveys recorded on the Missouri Department of Elementary and Secondary Education Core Data Collection System. This information, absent any identifying information, was obtained through follow-up surveys taken approximately 180 days after each class of 2011, 2012, and 2013 graduated. Information listing each student and what he or she was doing at approximately six months after graduation was received by fax and email.

Data Collection

The primary researcher was the superintendent of School District A, from which a portion of the archival, secondary data were obtained. Valid informed consent was obtained from the school board president of School District A to obtain archival, secondary data. Valid informed consent was obtained from the superintendents from School Districts B, C, and D to obtain archival, secondary data. For records, a third party extracted the data and removed all individual identifiers. Entries were identified by letters or numbers. Data were secured in a locked file cabinet in the primary researcher's

office. No humans were used in the study. Three years after completion of the project, all data will be destroyed.

A third party staff member collected archival data from surveys for all CTE course completers for the graduated classes of 2011, 2012, and 2013 from School Districts A, B, C, and D, removing identities from the data. Postsecondary placements from each of these surveys were tallied. The data were disaggregated into categories of postsecondary career, postsecondary CTE training, military, and college entry. The average of each postsecondary placement was calculated for graduates who had completed career and technical education.

Data Analysis

To address the first four research questions, a Pearson Product-Moment Correlation Coefficient (PPMCC), also known as *r*, was determined to measure the strength of linear fit (closest to +1) between student high school career enrollment data and postsecondary outcomes. The correlation results, *r*, for the students who attended Career and Technical Education at the rural home high school were compared to the correlation results, *r*, from the students who attended the Area Career Center to determine which post-secondary placement yielded the linear value closest to +1.

A *t*-test was conducted on archival data. This was performed to determine if there was a significant difference in postsecondary placement between the students from other sending school districts who attended CTE courses at their home schools versus sending school students who attended CTE courses at the Area Career Center.

Ethical Considerations

Valid and informed consent was obtained from other school districts to whom the primary researcher has no relationship and from which archival, secondary data were obtained. For records within the home rural district, a third party extracted the data and removed all individual identifiers to protect confidentiality. For data derived from other districts, the same process involved removing all individual identifiers to protect confidentiality. Entries were identified by letters or numbers. Data were secured in a locked file cabinet in the primary researcher's office. No humans were used in the study. On completion of the project, all data will be retained for three years and will then be destroyed.

Summary

Methods and procedures utilized in this study are outlined in this chapter to illustrate how these findings are useful and meaningful for School District A in addition to the other three districts examined within this study. The purpose and problem, rationale, research questions and hypotheses, research design, population and sample, instrumentation, data collection and analysis, and ethical considerations were further discussed within this chapter.

Moving forward, Chapter Four includes the data regarding what impact participating in career and technical education coursework has on postsecondary outcomes. These include specifically whether students choose postsecondary education in the form of college or technical school, employment in a related field, military, or choose to do nothing related to their high school career and technical education coursework.

Chapter Four: Analysis of Data

The primary purpose of this study was to generate information on the impact of secondary-level vocational education on post-secondary vocational training or career placement and success. This information may inform expansion of Career and Technical Education (CTE) offerings at the participating school districts. The current situation at the high schools involves a lack of participation by students in CTE coursework. Two in-house programs have high participation, but only a small number of students become CTE completers. Numbers attending the Area Career Center have also steadily dropped. As an example, in 2014, only one student from School District A was attending the Area Career Center.

Data were collected from the four area high schools that train students in CTE programs within each high school and send students to the Area Career Center. Data were collected from archival information. These data were retrieved from postsecondary follow-up surveys conducted by each high school on graduates, focusing on what those students were doing approximately six months after graduation. School counselors or administrators collect these data in February of the year following graduation. Possible outcomes include employment, military, college, postsecondary technical training, or nothing. A result of nothing indicated on the survey means the student was not involved with any of the other options.

Each high school collected this information on CTE completers, or those who have taken at least three courses within that particular CTE strand or content area. These de-identified data were collected on a spreadsheet with information from all four area high schools. Each school contributed information on students who completed a

vocational strand within their high school or who completed the strand by attendance at the Area Career Center. For both School DistrictiA and the similarly sized School District B, data were broken out into those who attended CTE courses at the Area Career Center and at the local high schools. All data were drawn from a three-year period including graduates from 2011, 2012, and 2013.

Research Question 1

Research Question 1 was used to determine whether a correlation existed between students who participated in career and technical education at the secondary level and postsecondary placement in college. To discover whether or not there was a relationship between the variables, the primary investigator began by organizing a frequency table (see Table 1) which provides data for those students who participated in CTE at School Districts A, B, C, and D for the years 2011, 2012, and 2013. To analyze Research Question 1, a Pearson product-moment coefficient of correlation (Pearson *r*) was calculated to assess the relationship between students who participated in career and technical education at the secondary level at each of these districts and postsecondary placement in college for these completers.

The Pearson *r* determines the strength of a straight linear fit closest to $r = 1.0$ (Laird Statistics, 2015). Guidelines have been proposed for the strength of association for coefficient *r* from a small positive correlation to a large negative correlation as seen in Figure 2 (Laird Statistics, 2015). Statistical analysis of Research Question 1 revealed $r = 0.999$ (see Table 2), which showed a large positive linear fit between completers and post-secondary enrollment in college.

Table 1

Frequency Table of Completer Placement After Graduation

Placement	2011	2012	2013
Technical	5	3	2
Military	5	2	6
Nothing	11	11	17
Employment	84	65	56
College	123	90	69
Total Completers	228	171	150

	Coefficient, *r*	
Strength of Association	Positive	Negative
Small	.1 to .3	-0.1 to -0.3
Medium	.3 to .5	-0.3 to -0.5
Large	.5 to 1.0	-0.5 to -1.0

Figure 2. Proposed guidelines for Pearson's correlation coefficient values. from IBM® SPSS® Statistics guides (2015).

Table 2

Pearson Correlation for CTE in High School and Postsecondary College Placement

		Participate in CTE	College
Participate In CTE	Pearson Correlation	1	0 .999**
	Sig. (2-tailed)		0 .001
	N	549	549
College	Pearson Correlation	0 .999**	1
	Sig. (2-tailed)	0 .001	
	N	549	549

Note. **Correlation is significant at the 0.01 level (2-tailed).

Research Question 2

To analyze Research Question 2, a Pearson product-moment coefficient of correlation (Pearson *r*) was calculated to assess the relationship between students who participated in career and technical education at the secondary level and were then placed in a related occupation. As seen in Table 3, $r = 0.981$, which indicated a large positive relationship between completers and placement in a related occupation (Laird Statistics, 2015).

Table 3

Pearson Correlation for CTE in High School and Postsecondary Employment Placement

		Participate in CTE	College
Participate In CTE	Pearson Correlation	1	0 .981**
	Sig. (2-tailed)		0 .001
	N	549	549
College	Pearson Correlation	0 .981**	1
	Sig. (2-tailed)	0 .001	
	N	549	549

Note. **Correlation is significant at the 0.01 level (2-tailed).

Research Question 3

To analyze Research Question 3, a Pearson product-moment coefficient of correlation (Pearson *r*) was calculated to assess the strength of relationship between the variables of students who participated in career and technical education at the secondary level and post-secondary placement in postsecondary vocational training. As seen in Table 4, $r = 0.042$, which indicated a small positive relationship between completers and placement in postsecondary vocational training (Laird Statistics, 2015).

Table 4

Pearson Correlation for CTE in High School and Postsecondary Vocational Training

		Participate in CTE	College
Participate In CTE	Pearson Correlation	1	0 .042
	Sig. (2-tailed)		0 .001
	N	549	549
College	Pearson Correlation	0 .042	1
	Sig. (2-tailed)	0 .001	
	N	549	549

Note. **Correlation is significant at the 0.01 level (2-tailed).

Research Question 4

To analyze Research Question 4, a Pearson product-moment coefficient of correlation (Pearson *r*) was calculated to assess the strength of relationship between the variables of all students who participated in career and technical education at the secondary level and any postsecondary placement (Technical, Military, Employment, or College). As seen in Table 5, $r = 0.999$, which showeda large positive relationship between completers and placement in postsecondary vocational training (Laird Statistics, 2015).

Table 5

Pearson Correlation for CTE in High School and Any Placement

		Participate in CTE	College
Participate In CTE	Pearson Correlation	1	0 .999**
	Sig. (2-tailed)		0 .001
	N	549	549
College	Pearson Correlation	0 .999**	1
	Sig. (2-tailed)	0 .001	
	N	549	549

Note. **Correlation is significant at the 0.01 level (2-tailed).

Research Question 5

For Research Question 5, a paired-samples *t*-test was conducted using data from Table 6 to determine if there was a difference between District A students who attended Career and Technical Education courses at District A and post-secondary placement versus District A students who attended Career and Technical Education courses at the Area Career Center and post-secondary placement. The definition of a *t*-test is "a parametric statistical test used to see whether a difference between the means of two samples is significant" (Fraenkel et al., 2015, p. 233).

Table 7 reveals the data for the paired samples *t*-test conducted. The *t*-value was 1.377 with 2 degrees of freedom (*df*). The *p*-value was .120. The result was not significant at $p < .05$. Therefore, the null hypothesis was not rejected.

Table 6

Post-Secondary Placement for Students Who Attended School District A

2011	Employ	College	Tech	Military	Nothing
District A	8	12	3	0	0
ACC	3	0	0	0	0
Total 2011	11	12	3	0	0
2012	Employ	College	Tech	Military	Nothing
District A	5	1	2	0	2
ACC	2	1	0	0	0
Total 2012	7	2	2	0	2
2013	Employ	College	Tech	Military	Nothing
District A	7	1	1	0	2
ACC	0	1	0	0	0
Total 2013	7	2	1	0	2

Note. ACC = Students from district to the Area Career Center.

Table 7

Paired Samples t-test for Placement of District A Students Attending District A vs. ACC

	Correlation	*t*	*df*	Sig
District A	.120	1.377	2	.302

Note. Statistical significance is noted at $p \leq .05$.

Research Question 6

For Research Question 6, descriptive data were used to determine if there was a difference between sending school students from Districts B, C, and D who attended Career and Technical Education courses at Districts B, C, and D and post-secondary placement versus students from Districts B, C, and D who attended Career and Technical Education courses at the Area Career Center and post-secondary placement. The evaluation revealed 91% of sending school district students from Districts B, C, and D who attended Career and Technical Education courses at Districts B, C, and D for years 2011, 2012, and 2013 achieved post-secondary placement.

Sending school district students from Districts B, C, and D who attended Career and Technical Education courses at the Area Career Center found 94% post-secondary placement (see Table8. The results from student post-secondary placement revealed there was no difference between the placement for students who attended either a District or Area Career and Technical facility (Fraenkel et al., 2015).

Table 8

Post-Secondary Placement for Students Who Attended School Districts B, C, and D

2011	Employ	College	Tech	Military	Nothing
District B	3	13	0	0	0
ACC	3	1	0	1	2
District C	24	25	2	0	4
ACC	0	0	0	0	0
District D	*	*	*	*	*
ACC	43	72	0	4	5
2012	**Employ**	**College**	**Tech**	**Military**	**Nothing**
District B	2	10	0	2	0
ACC	4	3	0	0	0
District C	7	20	1	0	4
ACC	0	0	0	0	0
District D	*	*	*	*	*
ACC	45	55	0	0	5
2013	**Employ**	**College**	**Tech**	**Military**	**Nothing**
District B	3	7	0	0	0
ACC	5	3	0	0	3
District C	6	16	1	2	7
ACC	0	0	0	0	0
District D	*	*	*	*	*
ACC	35	41	0	4	5

Note. ACC = Students from district to the Area Career Center. *District D houses ACC.

Summary

In Chapter Four, statistical analyses of data were summarized. Chapter Five includes a discussion of the resulting data. Major elements in the study are reviewed including comparative data from among the sampled population. In Chapter Five, research-based conclusions are drawn from the data regarding the effectiveness of CTE on students' post-graduate success in placement. Further, implications for practice are presented. In addition, the chapter includes recommendations for future research.

Chapter Five: Summary and Conclusions

Public Schools in the United States continue to promote college education as the best path students should take toward postsecondary success (Conley & McGaughy, 2012). For School District A, located within the south central region of the state of Missouri, the push for college success appears to leave many students out of alternate resources and plans after graduation. The purpose of this quantitative study was to examine differences among placement outcomes after graduation for students who participated in CTE while in high school. This study involved examination of the usage of career and technical education courses as a resource and guide for further advancement into postsecondary success in college, vocational training, employment, or military placement by comparing and determining whether a correlation exists between students enrolling in and completing vocational courses and their resulting placement six months after graduation. Also, data were examined to determine if differences existed between the placement for students who attended either a District or Area Career and Technical facility.

Findings

The following research questions were used to determine the impact of CTE on postsecondary placement for students:

Research question 1. The first research question was designed to determine if a correlation existed between students who participated in career and technical education at the secondary level and postsecondary placement in college.

The number of students from all four school districts was totaled to determine if there was a correlation between students who completed CTE coursework and enrollment in college after graduation. The data showed that over 51%, or 282 out of 549 students,

chose to pursue a college career even though they had completed a CTE program during their high school careers. The resulting Pearson *r* showed a statistical analysis of Research Question 1 to be equal to 0.999 (Laird Statistics, 2015). This depicted a large positive linear fit between completers and postsecondary enrollment in college.

The null hypothesis for Research Question 1 was rejected. The data showed a high correlation existed between students who completed a strand of CTE coursework within their subject and who then were enrolled in college coursework.

Research question 2. The second research question was designed to determine if a correlation existed between students who participated in career and technical education at the secondary level and postsecondary placement in a related occupation.

For Research Question 2, graduating students from High Schools A, B, C, and D were surveyed to see how many students would enter a CTE training-related occupation immediately or within approximately six months after graduation. The results indicated a 37% rate, or 205 out of 549 students, completed a CTE program and also entered into an occupation within that field. In addition, the Pearson *r* was calculated to assess the relationship between students who participated in career and technical education at the secondary level and who were then placed in a related occupation. The $r = 0.981$ showed a large positive relationship between completers and placement in a related occupation (Laird Statistics, 2015).

The null hypothesis for Research Question 2, which stated there is no correlation between students taking CTE coursework and then choosing to enter employment immediately after graduation, was rejected. While the number of students trained, prepared, and who entered an employment field in the CTE path for which they were

trained was low compared to those entering college, there was a large number who did follow this choice. There was a strong correlation between those completing CTE coursework and those who entered the workforce.

Research question 3. The third research question was designed to determine the correlation between students who participated in career and technical education at the secondary level and placement in postsecondary vocational training.

The number of students found to have entered postsecondary training was relatively small in comparison to the other options of college and employment. For Research Question 3, 1.8% of students chose to pursue postsecondary vocational training after graduation from high school due to 10 out of 549 meeting this criterion. The Pearson *r* was calculated to assess the correlation introduced in Research Question 3. With $r = 0.042$, a small positive relationship existed between completers and placement in postsecondary vocational training (Laird Statistics, 2015). For this reason, the null hypothesis for Research Question 3 was rejected.

Research question 4. The fourth research question was designed to determine the correlation for all students who completed career and technical education courses and placement after graduation.

For Research Question 4, the data were examined to determine whether there was a correlation of all students who completed CTE courses and successful placement after graduation. Placement consideration included college, vocational training, military, or employment placement. The percentage of those attaining viable placement was 92.53% due to 508 students out of a possible 549 being successfully placed within a three-year period. The Pearson product-moment coefficient of correlation was calculated, and *r* =

0.999. This Pearson *r* showed a large positive relationship between students completing CTE coursework and placement in college, vocational training, military, or employment. For this reason, the null hypothesis for Research Question 4 was rejected.

Research question 5. The fifth research question was designed to determine the difference between District A students who attended Career and Technical Education courses at District A and post-secondary placement versus District A students who attended Career and Technical Education courses at the Area Career Center and post-secondary placement.

For Research Question 5, a paired-samples *t*-test was conducted. Data from Table 7 were used to determine if there was a difference between District A students who attended CTE courses at District A compared to those students who completed CTE courses at the Area Career Center. As Table 6 indicated, the *t*-value was 1.377 with 2 degrees of freedom (*df*). The *p*-value was .120. Therefore the result was not significant at $p < .05$. There was not a significant difference in the performance or result of placement between those students who completed CTE courses at District A and other students from District A who completed courses at the Area Career Center.

For these reasons, the null hypothesis was not rejected. There was no difference regarding where the courses were completed in terms of postsecondary placement after graduation.

Research question 6. The sixth research question was designed to determine the difference between sending school district students from Districts B, C, and D who attended Career and Technical Education courses at Districts B, C, and D and post-

secondary placement versus Districts B, C, and D students who attended Career and Technical Education courses at the Area Career Center and post-secondary placement.

Descriptive data were used, and the evaluation revealed 91% of sending school district students from Districts B, C, and D who attended CTE courses at Districts B, C, and D for years 2011, 2012, and 2013 achieved post-secondary placement (see Figure 3). Sending school district students from Districts B, C, and D who attended CTE courses at the Area Career Center found 94% post-secondary placement (see Table 7). The results from student post-secondary placement revealed there was no difference between the placement for students who attended either a District or Area Career and Technical facility (Fraenkel et al., 2015). The null hypothesis was not rejected for Research Question 6.

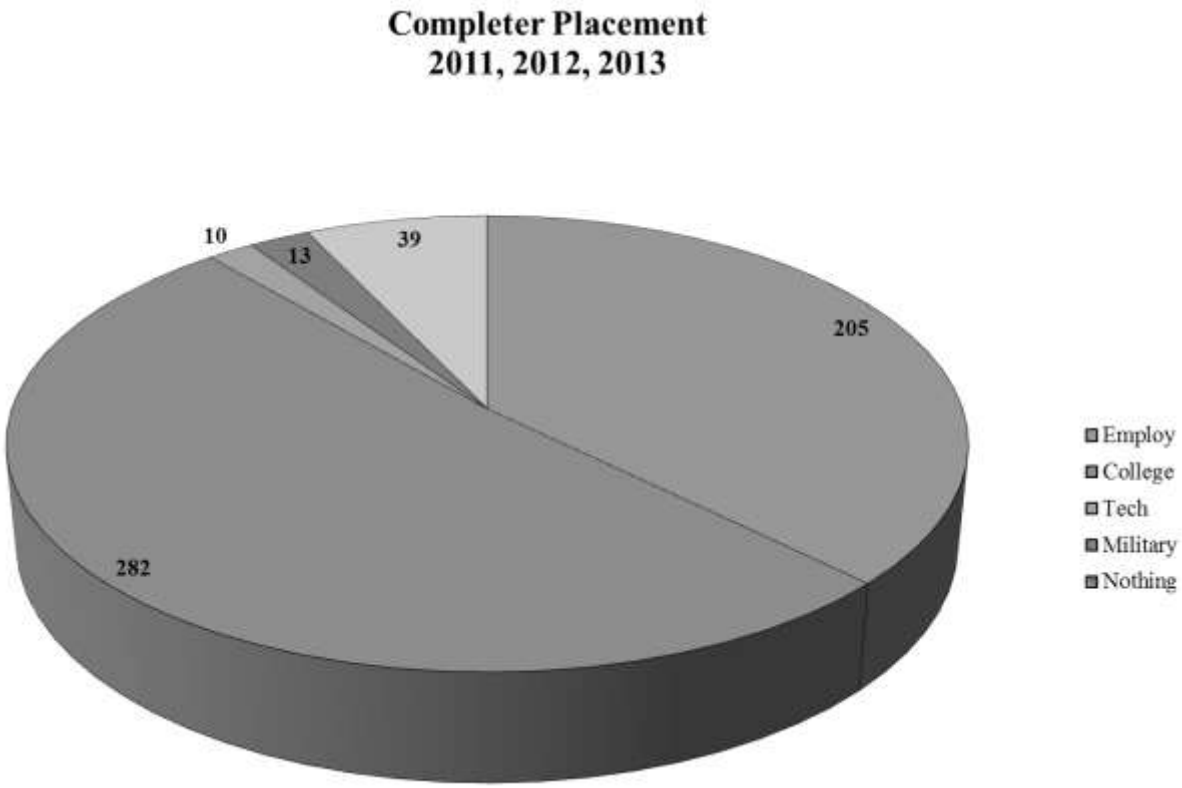

Figure 3. Completer placement for graduation years 2011, 2012, & 2013.

Conclusions

The results from the study showed a correlation between students completing career and technical studies in high school and subsequent placement in related employment after graduation. For years, the national push has been for all students to be trained and prepared with the necessary skills to enter into college and be successful (Conley & McGaughy, 2012). As evidenced in this study, there are varied opportunities for employment after high school graduation that do not require college coursework. Indeed, there are alternate paths to success other than acquiring a college degree (Chase, 2011).

There was no significant difference between students trained in career and technical education at a home high school versus those trained at the Area Career Center. For this study, there was no significant difference among the percentages of students entering college, employment, continued postsecondary training, or military training for the four high schools sampled. This does not mean Area Career Centers are not needed (Aliaga, Kotamraju, & Stone, 2014). Nor does this mean CTE courses should not be offered at local high schools (Alfeld & Bhattacharya, 2012).

For the four participating schools in this study, the most common CTE courses offered at each high school generally consisted of Business, Agriculture, and Family and Consumer Science. These three subjects usually had higher enrollment numbers and were more easily made available on campus. Other programs such as Welding, Construction, Food service, Masonry, HVAC, Computer Design, or Nursing were not offered at each high school due to lack of resources or necessary enrollment; therefore, students interested in these areas benefited from the cooperative effort of theArea Career Center.

Another of the most striking conclusions drawn from this study was the negationof the idea CTE courses are only designed for non-college ready students (Wang et al., 2015). In fact, 282 of the 549 students who participated in CTE coursework and finished the strand to be labeled a completer later enrolled and participated in college. As stated in Chapter One, CTE education courses have been steadily pushed back to provide all students with the necessary skills to enter college (Rose, 2012). Further, students are not discouraged from attending college through enrolling in CTE coursework. Often, CTE courses require reading and mathematics skills beyond what is required in core subjects within a high school (Archbald & Farley-Ripple, 2012).

Implications for Practice

The MODESE (2015a) has done excellent work at requiring schools to track and keep record of students who are enrolled in CTE coursework as well as those students who are completers by finishing the minimum three courses . The state now requires some form of testing to measure student achievement for that particular track (MODESE, 2015a). By incorporating these data with information on other six-month data after graduation, determinations might be made on what type of coursework most properly prepares students for college or career readiness.

Career and technical education curriculum can work hand-in-hand with future college training (Wright, Thomas, & Rogers, 2014). Career and technical education courses are now seen as requiring many of the same skills necessary to succeed in college (Alfeld & Bhattacharya, 2012). Therefore, it should be the goal of vocational programs and career centers to incorporate these types of skills within their programs and to advertise this integration to prospective students (Wright et al., 2014). This not only

reinforces skill building and integration of both college and career skills, but allows for more choices for students (Blackhurst et al., 2003). Students will no longer be set in a particular path such as a career option, but will have the room and flexibility to explore career options while still maintaining effort to college preparation (Davis & Shih, 2007).

Along with this more integrated curriculum, changes in scheduling to accommodate students wanting to take CTE coursework while maintaining proper college preparatory courses would be beneficial. One difficulty expressed with taking career and technical classes is that students do not have room in their schedules to include enough CTE coursework to be considered a completer while still yet completing necessary courses to prepare for college. One step might be to increase a daily schedule in number of hours by decreasing the time allotted for each class hour by a few minutes. By doing this, an eighth hour could be added into a traditional seven-hour schedule. This might create extra room for alternative CTE coursework that might otherwise be unavailable.

Recommendations for Future Research

Additional research could be extended to a statewide or even national database to get a true picture if this is more than a local issue. Schools from across the country have faced similar questions about the role and place of CTE coursework (NACTE, 2014). Missouri in particular requires the reporting of postgraduate placement data for all public Missouri high schools (MODESE, 2015c). This same study could be conducted on a much broader scale and with a much broader population sample size. This would give a more accurate picture of the place for CTE coursework across a broader spectrum.

Another of the areas that may see beneficial future research is postsecondary success of students who have been CTE completers in high school compared to students who have not completed secondary CTE coursework (Plank et al., 2008). This does not mean success in the sense of grades achieved but rather successful placement of those students (Reese, 2011). While this study focused on CTE completers, the question may be asked how completers compare in postsecondary placement to graduated students who were not CTE completers. This could draw comparisons of how students were trained or prepared for any of the possible outcomes including college placement, postsecondary vocational training, military, or employment immediately after graduation.

In addition, research regarding socioeconomic background could play a role in the correlations (Marks, 2011). Recent studies indicate parental occupations play a role in the achievement of students (Marks, 2011). A further study might examine the effect parental income or employment type might have on postsecondary success.

Summary

The results from this study revealed strong correlations between students completing CTE coursework and postsecondary placement in college, vocational training, military, and employment. Career and technical education certificates give students not only credits to find employment or continued education, but also give students confidence they can succeed with the skills needed (Reese, 2011). Technical and career associate degrees can help place graduates into well-paying careers (Schneider, 2013).

Schools should emphasize the benefits of completing a CTE program to students at a young age (Kezar & Eckel, 2002). Not all students will find success in college

(Harvey, 2001). A career training program is a tool to help many succeed who would not be successful in a traditional college setting (Plank et al., 2008).

Appendix A

Student Follow-Up Survey

ANYTOWN HIGH SCHOOL/CAREER CENTER
BUSINESS/MARKETING EDUCATION
FOLLOW-UP SURVEY OF CAREER EDUCATION GRADUATES

Name_____
(Last) (First) (Middle) (Maiden)

Permanent Address (or address at which someone would know how to contact you)

_____
(Address) (City) (State) (Zip)

Type of career education instruction you received at your high school, career center or community college:
(i.e., Business Management and Administration, Finance, Information Technology, Marketing)

_____
(Type)

1. Present employment status (circle one):
   a. Employed full-time in field (or related field) of study
   b. Employed part-time in field (or related field) of study
   c. Other unrelated full-time employment

   List field of employment (circle one):
   d. Unemployed (1) Seeking employment (2) Not Seeking employment

   e. Unavailable (1) Attending school (3) Homemaker
   (2) Military Service (4) Other

2. If you checked 1c (other unrelated employment), which of the following reasons best answers why you took a job outside the field of study? (circle one)
   a. Could not find job in area of study
   b. Location of available job in area of study not convenient
   c. Lacked the skill levels required for available jobs in area of study
   d. Type of work undesirable
   e. Better salary in job outside of field
   f. Other (explain)

3. Did you receive job placement assistance from your high school, career center or community college?_____
   _____

4. Present job title_____

5. How long have you been employed at this job?_____

6. What duties do you find most difficult?_____

7. What software packages do you use most frequently (i.e., Word, WordPerfect, Excel, etc.)?
   ❒ Word ❒ Excel ❒ PowerPoint ❒ Access ❒ Other:_____

Student Follow-Up Survey 2

8. What units of study in your career education study were most helpful?_____

_____

9. What units of study in your career education study were least helpful?_____

_____

10. For business students: Did your career education courses/program prepare you in the following areas to meet your employer's requirements? (yes or no)

*What was employer's requirement?_____

Place a checkmark by the correct response:

	YES	NO	N/A		YES	NO	N/A
Cable Wiring/Installing				Keyboarding*			
Calculators				Loading Software			
Chart and Graph Preparation				Machine Transcription*			
Composition (letters, etc.)				Network Management			
Computations/Verifications				Presentational Software			
Computer Programming				Problem-Solving			
Configuration Routers				**Processing Mail**			
Copy/Fax Machine				Proofreading			
Database Software				Records/Reports Compilation			
Decision-Making				Spreadsheet Software			
Desktop Publishing				Stress Management			
Editing/Revising				Tasks Prioritization			
Electronic File Management				Telephone			
Electronic Forms				Text/Graphics Scanning			
Electronic Mail				Time Management			
Filing (Manual)				Website Development			
Grammar and Punctuation				Word Processing			
Human Relations				Work Habits			
Internet							

11. What suggestions or recommendations would you make to improve the effectiveness of career education at your local high school, career center, or community college?

_____

_____

_____

Other Comments:_____

_____

Student Follow-Up: Alert Letter

(School Letterhead)

Date

Name
Address
City, State Zip

Dear :

In the near future, you will receive a questionnaire concerning your experiences since leaving our school. I would appreciate your cooperation in completing and returning the questionnaire. The questionnaire is designed to aid in improving our Business/Marketing Education program for the future. Your responses to the questions will be of tremendous aid to us and to the students now enrolled in the program. Your answers will be kept in strictest confidence.

I look forward to getting your response!

Sincerely,

Business/Marketing Teacher

Student Follow-Up: Cover Letter

(School Letterhead)

Date

Name
Address
City, State Zip

Dear _____:

Each year the faculty and administration of _____(High School or Career Center) asks our graduates to evaluate the Business/Marketing Education program.

As a graduate of the Business/Marketing Education program, you are being asked to participate in a follow-up study. A summary of where our graduates are currently employed or enrolled in post-secondary education is necessary for continued funding of our program. We also need your suggestions as to how we can make the Business/ Marketing Education program better.

You will make a tremendous contribution to the future improvement of the program by completing and returning the enclosed survey. The information you supply will be treated in strict confidentiality. Please take a few minutes to complete this form and return it in the enclosed envelope by _____.

Thank you for your help. If I can be of any assistance to you, please contact me.

Sincerely,

Business/Marketing Teacher

Enclosures: Follow-Up Survey
Mailing Envelope

Appendix B

LINDENWOOD

LINDENWOOD UNIVERSITY ST. CHARLES, MISSOURI

DATE:	February 17, 2015
TO:	Allen Moss
FROM:	Lindenwood University Institutional Review Board
STUDY TITLE:	[698512-1] Secondary Career and Technical Education on Postsecondary Career and Educational Placement: Rural School Districts in Missouri
IRB REFERENCE #:	
SUBMISSION TYPE:	New Project
ACTION:	APPROVED
APPROVAL DATE:	February 17, 2015
EXPIRATION DATE:	February 17, 2016
REVIEW TYPE:	Expedited Review

Thank you for your submission of New Project materials for this research project. Lindenwood University Institutional Review Board has APPROVED your submission. This approval is based on an appropriate risk/benefit ratio and a study design wherein the risks have been minimized. All research must be conducted in accordance with this approved submission.

This submission has received Expedited Review based on the applicable federal regulation.

Please remember that informed consent is a process beginning with a description of the study and insurance of participant understanding followed by a signed consent form. Informed consent must continue throughout the study via a dialogue between the researcher and research participant. Federal regulations require each participant receive a copy of the signed consent document.

Please note that any revision to previously approved materials must be approved by this office prior to initiation. Please use the appropriate revision forms for this procedure.

All SERIOUS and UNEXPECTED adverse events must be reported to this office. Please use the appropriate adverse event forms for this procedure. All FDA and sponsor reporting requirements should also be followed.

All NON-COMPLIANCE issues or COMPLAINTS regarding this project must be reported promptly to the IRB.

This project has been determined to be a project. Based on the risks, this project requires continuing review by this committee on an annual basis. Please use the completion/amendment form for this procedure. Your documentation for continuing review must be received with sufficient time for review and continued approval before the expiration date of February 17, 2016.

Please note that all research records must be retained for a minimum of three years.

If you have any questions, please contact Robyne Elder at (314) 566-4884 or relder@lindenwood.edu. Please include your study title and reference number in all correspondence with this office.

If you have any questions, please send them to relder@lindenwood.edu. Please include your project title and reference number in all correspondence with this committee.

This letter has been electronically signed in accordance with all applicable regulations, and a copy is retained within Lindenwood University Institutional Review Board's records.

Certificate of Completion

The National Institutes of Health (NIH) Office of Extramural Research certifies that **Allen Moss** successfully completed the NIH Web-based training course "Protecting Human Research Participants".

Date of completion: 06/04/2014

Certification Number: 1480654

Appendix C

Lindenwood University
School of Education
209 S. Kingshighway
St. Charles, Missouri 63301

Permission Letter: [redacted]

<Date>

Dear Superintendent [redacted]

I am conducting a research study titled, *Secondary Career and Technical Education on Postsecondary Career and Educational Placement: Rural School Districts in Missouri*, in partial fulfillment of the requirement for a doctoral degree in Educational Administration at Lindenwood University. The research gathered should assist in providing insight on the impact of Career and Technical Education on post-secondary student career, college, or vocational education placement.

I am seeking your permission as Superintendent of the [redacted] School District and Area Career Center to obtain redacted archival Career and Technical Education (CTE) enrollment data and post-secondary placement data for students from years 2011, 2012, and 2013.

Participation in the study is completely voluntary. You may withdraw your consent at any time without penalty. The identity of the school district will remain confidential and anonymous in the dissertation or any future publications of this study.

Please do not hesitate to contact me with any questions or concerns about participation (phone: (417) [redacted] or e-mail: [redacted]). You may also contact the dissertation advisor for this research study, Dr. Julie Williams, (phone: (417) [redacted] or e-mail: [redacted]). A copy of this letter and your written consent should be retained by you for future reference.

Respectfully,

Allen Moss
Doctoral Candidate
Lindenwood University
Permission Letter (cont.)

I have read this consent form and have been given the opportunity to ask questions.

I understand it is my responsibility to retain a copy of this consent form, if I so choose. I consent to participation in the research described on the preceding page.

_____	_____
Superintendent‘s Signature/Date	Superintendent‘s Printed Name
_____	_____
Primary Investigator‘s Signature/Date	Primary Investigator‘s Printed Name

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Vita

Roy Allen Moss was born March 15, 1971, in West Plains, Missouri. He graduated from West Plains High School in West Plains, Missouri, in May of 1989. He graduated with a Bachelor of Science in Business Administration-Accounting from Missouri Southern State University in Joplin, Missouri, in May of 1993. He obtained his teaching certification in December of 2002 through Missouri State University in Springfield, while beginning teaching with the West Plains School District in 2001 and continuing there until May 2009. He completed his Masters in Secondary Administration in 2007 and his Specialist in Educational Administration in 2010, both from William Woods University in Fulton, Missouri. From July 2009 until June 2012, he served as the K-12 Principal for the Oregon-Howell R-III School District in Koshkonong, Missouri. From July 2012 to the present, he has served as Superintendent of the Couch R-1 School District in Myrtle, Missouri.