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The Perceptions of High School Graduates of Career and Technology Education Courses

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COLLEGE OF EDUCATION

This is to certify that the doctoral study by

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2012

Abstract

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MA, The Citadel, 2001

BS, Southern Illinois University, 1999

Doctoral Study Submitted in Partial Fulfillment

of the Requirements for the Degree of

Doctor of Education

Teacher Leadership

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Abstract

Career and technology education (CATE) courses were offered to high school students as an alternative form of education. The research problem at the study site, which is a high school located in southeastern United States was the lack of research-based findings on high school graduates' perceptions of CATE courses. The purpose of this study was to understand the participants' perceptions of the impact of CATE courses on career goals. The research question that guided this study was: What are the perceptions of high school graduates of a CATE program? The conceptual framework was based upon multiple intelligences, differentiated instruction, and the social cognitive theory of self-efficacy. Purposive sampling was used to identify 10 high school graduates who took CATE courses and were interviewed to share their perceptions of those courses. Responses were audio taped and transcribed for content analysis and coding to identify common themes on this topic. The findings indicated that CATE courses provided students with practical applications by which CATE instructors strived to meet the needs of students, indicating that CATE students have been prepared for career opportunities. The findings also indicated that CATE students graduated from high school because students developed technical and academic skills through the program. Implications for positive social change include potentially increase rate of high school graduation of CATE students and the impact of CATE courses on graduates' career goals. The results of this study can be used by CATE teachers and school administrators to support continued advocacy for teacher professional development within the field of CATE courses.

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Dedication

I dedicate this study to the many high school students who have or will be taking career and technology education classes. I also dedicate this to the many teachers who have taught or will be teaching career and technology classes.

Acknowledgments

I am grateful to God for allowing me the opportunity to perform this research study. I acknowledge Dr. Kiriakidis for all the help and assistance he has provided me in this endeavor. Dr. Kiriakidis encouraged me to go on and never give up and offered the support I needed. Dr. Kiriakidis went beyond and above the call of duty to help me. For this I give thanks. I also thank the staff at Echo Career Center (which is a pseudonym the actual location) for their patience. I acknowledge the high school students for being patient with me and their understanding in this matter.

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Section 1: Introduction to the Study

Career and Technology Education (CATE) courses have been designed to assist high school students with their career goals by helping them develop technical skills. CATE courses were offered in some high schools to prepare students for employment in technical fields. The curriculum of these courses follows the theory of multiple intelligences Gardner, (1983). According to Hughes, Bailey, and Karp (2002), the purpose of CATE was to provide high school students with a technical education to develop a skilled labor force in the United States by providing training in various job-related skills. Mndebele and Diamini (2008), however, stated that CATE is a last chance curriculum for students who cannot make satisfactory progress in the traditional high school curriculum. According to Mupinga and Livesay (2004), CATE has been considered a lesser form of education for students who may not be successful in traditional school curricula. The Carl Perkins Act was signed into law on October 31, 1998 by President Clinton to provide technical education opportunities for youth and adults (U.S. Dept of Education, 1998). The Bush Administration funded the Perkins Act between the years 2006 and 2009. The purpose for continued funding was the strengthening of academic and technical education (U.S. Dept of Education, 1998). Government funding for CATE courses was nECC ssary because these courses were designed to help high school students develop technical skills for creating a competitive workforce (National Association of State Directors, 2008). High schools offering CATE courses rECC ived funding for CATE courses that included the purchase of textbooks, materials, equipment, and salaries for teachers in order to make this alternative education

available to high school students. According to Hood (2005), if funding for CATE was not available, students who could have benefited from this alternative form of education would not have access to opportunities in a CATE program. Awareness of CATE benefits may help school K-12 school and district administrators with promoting this alternative form of education initiatives. CATE courses are offered during the school day. High school students enrolled in a CATE program work in local businesses after school hours or on weekends. The context of the study was described in section 1.

For the purpose of this study, the Echo Career Center (ECC), which is a pseudonym for the school. At this site 13 CATE courses are offered each year. Since 2007, the CATE department some courses was not offered due to enrollment decreases and reductions in government funding; as a result 600 students did not have the opportunity to take CATE courses at ECC. One goal of this study was to seek perceptions of students who completed CATE courses at the study site, and so I sought participants among high school graduates who completed CATE courses in 2010-2011

Problem Statement

The research problem at the research site was the lack of research-based findings on high school graduates' perceptions of CATE courses and the impact of the CATE curriculum on high school graduates' career goals. The focus of this study was on the perceptions of high school students of a CATE program. No research had been conducted at the research site to provide stakeholders with research-based findings on the perceptions of high school graduates who took CATE courses by interviewing these graduates. The findings may help school and district administrators, educational

organizations, and teachers with decision-making processes about student placement in CATE courses and curriculum initiatives that may improve these courses.

Nature of the Study

According to Hatch (2002), a qualitative case study design is about personal experiences. The rationale for choosing a case study design was based upon the type of data collected via interviews, the timeline of my research, and the coding of the interview transcripts. The 10 high school graduates were interviewed to understand their experiences concerning CATE courses. The participants were high school students who graduated from ECC and took CATE courses during their time as students at the ECC. The participants were at least 18 years old. The ECC is located in southeastern United States and offered 13 CATE classes when interviewees were enrolled there during the 2010-2011 school year.

I interviewed 10 high school graduates to understand their perceptions of CATE courses. I obtained the participants' names and contact information from ECC's Guidance Department. My relationship with the participants was strictly that of a researcher and former instructor. Because the participants were high school graduates from ECC, no authoritative role existed between the participants and me.

Each of the 10 participants was interviewed three times. Each interview was approximately 1 hour. For each participant, the first and second interviews were for data collection following the interview protocol, and the third interview was for member checking to assure all data were correctly recorded and stated exactly what each participant wished to convey. Because all participants agreed to be interviewed, the total

number of interviewing time was 30 hours. The interviews were held in a comfortable place selected by each interviewee, and I utilized the interview protocol (Appendix A). The participants were asked to answer questions accurately and honestly to help increase the integrity of the study. Data were recorded using a laptop computer with a microphone. Data were stored on the computer's hard drive and a backup copy was stored on a thumb drive. Raw data were transcribed and analyzed in order to identify common themes, patterns, and relationships. Hatch (2002) indicated that data should be analyzed looking for patterns, relationships, and themes.

The phenomenological method was not chosen because the phenomenological research method identifies the “essence” of a human experience. The essence of a human experience involved emotions, thoughts, opinions, or physical attributes. The phenomenological study involved a study of a small number of subjects extensively and over a prolonged period of time to obtain patterns and relationships (Hatch, 2002). I did not examine human feelings, mental, emotional or physical attributes. Data were obtained from each participant. Therefore, the appropriate research method was the case study.

The case study method helped me to interview one or more individuals to obtain information about their experiences with CATE courses (Hatch, 2002). A case study design was appropriate for my study because I sought to understand the personal experiences of the participants. The participants were interviewed using open-ended questions to generate in-depth responses that described their perceptions of CATE courses. The analysis of the research study focused on the collective views of the

participants to gain a systemic understanding of their perceptions of CATE courses. Each case was important to understand their thoughts on their experiences.

Research Question

The research question that guided this study was as follows: What are the perceptions of high school graduates of CATE courses?

Purpose of the Study

The purpose of this qualitative case study was to provide stakeholders at the research site with research-based findings on the perceptions of high school graduates of a CATE program. At the research site, high school students were required to master CATE curriculum. An understanding of the participants' perceptions of CATE courses was to assist stakeholders at the research site in regards to the success of CATE courses. At the research site, school leaders and teachers needed research-based evidence to remediate CATE curriculum.

Conceptual Framework

The conceptual framework was based on the concepts of multiple intelligences (Gardner, 1983), differentiated instruction (Tomlinson, 1999), and social cognitive theory of self-efficacy (Bandura, 2009). CATE courses were designed to provide high school students with hands on education for real world situations (Hughes, Bailey, & Karp, 2002). Multiple intelligences were used to create, repair, or perform problem solving activities (Muncy, 2006). Citizens in the 21st century require an education, moves beyond reading, writing, and mathematics to help students learn how to think, gather data, and formulate models (Posner, 2002).

Multiple intelligences theory was developed in 1983by Howard Gardner who posited that intelligence was multifaceted and not singular. Gardner described intelligence as a bio-psychological ability to process information that can be initiated in a cultural varying setting to solve problems or create items of value in a particular culture. Real-world activities require various types of intelligences defined by Gardner are musical, kinesthetic, logical mathematics, spatial, linguistic, interpersonal, intrapersonal, and naturalist (Gardner, 1993, 1999).

Musical intelligence included the thought processing of sound, rhythms, melodies and rhymes. Usually this type of intelligence was used to engage in active listening and creating connections between music and emotions (Gardner, 1993). Kinesthetic included the thought processes in terms of bodily movement for expressive and goal-directed activities, a sense of timing, and use of hands and coordination of body movement. Logical-mathematical intelligence dealt with the ability to calculate, quantify or consider propositions and perform complex mathematical operations involving inductive and deductive reasoning. Interpersonal intelligence involved interacting effectively with one or more people in a familiar, casual, and working conditions.

Intrapersonal intelligence was the ability to think about or understand one's self. The naturalist intelligence dealt with the natural world including plants, animals and scientific studies or to interact effectively with other creatures and or natural forces (Gardner, 1993).

A student requiring extra instructional assistance could benefit from Gardner's theory of multiple intelligences. CATE courses utilize multiple intelligences as students

learned by teaching methods such as drill and practice, peer instruction, and project. Muncy (2006) recommended the use of group projects, mentoring projects, class presentations, discussions, web-based instruction, and student-centered learning activities to make the best use of multiple intelligence learning styles. Student activities utilized interpersonal and intrapersonal intelligence which improved student achievement to help improve the relationship between student(s) and teachers (Muncy, 2006).

CATE courses helped students utilize multiple intelligences as they learn through various teaching methods to include drill and practice, cooperative grouping, peer instruction, and one-on-one instruction. Students in a computer repair/Cisco networking class used visual clues to assist in troubleshooting a computer.

According to Shearer and Luzzo (2009), multiple intelligences were used to promote career development, which focused on: (a) realistic self-appraisal of abilities, (b) understanding skills used in various types of work, and (c) facilitation of true reasoning. People have varying types of intelligences, and so; they learn in different ways (Allan & Tomlinson, 2000). Schools should include student-centered learning based upon the student's intelligence choice (Allan & Tomlinson, 2000).

Modifying instruction to meet the learner's needs was called differentiated instruction (Stanford, Crowe, & Flice, 2010). One method to provide opportunities for varying methods of learning was to utilize differentiated instruction through the use of technology (Stanford et al., 2010). Differentiated instruction ensured a student learns, knowing the student learns, the methods the student best demonstrated mastery by examining student's readiness level, interest, and preferred mode of learning (Ellis,

Cable, Greg, & Rock, 2008). Anderson (2007) explained that differentiated learning originates from the differences in how a student learns their preferences and interest. Differentiated learning was grounded in the constructivist learning theories (Anderson, 2007). CATE instructors use various instructional methods. For example, an automotive instructor may have used a chalkboard for visual and audible instruction. Then, the instructor may have transitioned to demonstrations, drill and practice, and hands-on guided practice. Levy (2008) indicated that educators can address the learning styles of all students using differentiated instructional methods. Bandura (2009) explained that people act or react to media such as television, other people's activities, and natural surroundings. Bandura (2009) showed how positive modeling can help to bring about positive changes in people's behavior and thinking patterns. Kolodinsky et al, (2006) described how a job fair was used to improve the self-efficacy of female high school students to improve their interests in varying careers. Hall (2003) stated that self-efficacy is a vital component in assisting high school students to make career choices.

According to Allan and Tomlinson (2008), Vygotsky indicated how a student felt towards learning or the perception of what they learn may impact the knowledge gained at that time or in the future. Jimenez (2006) stated that students have to believe they can be successful in learning and in mastering skills and this belief that a person has in themselves to be successful is known as self-efficacy. One concept in the social cognitive theory was that people reacted or acted based upon actions previously observed and these actions may shape a person's social behavior and thinking processes. Pajares (2003) stated that people's behavior or success is predicated based upon their belief in

themselves. According to McCabe (2006), a student's belief in his inability to learn the English language actually prevented the student from learning the language. CATE help build a student's self efficacy by allowing them to be successful at a curriculum they really enjoy. Students taking CATE courses often feel good about themselves when they discover that they "can do" the skills or competencies being taught. Students can also produce a finished product or repair an item which build a student's self-esteem and self-efficacy. Once a student believes thay can or will be successful, they often will be successful.

Definition of Terms

To provide a better understanding of the terms used in this study, the following terms have been defined.

At-risk student: A student who exhibited one or more of the following characteristics: (a) a student who has been retained in one or more grades or may have a sibling dropout; (b) a student who may have experienced low achievement in school; (c) a student who may have been a member of a family with low socioeconomic status; and (d) students who may have experienced high absenteeism, disciplinary problems, or over-age for their grade level (Bowers, 2010).

CATE (Career and Technology Education): A curriculum started as vocational education and includes variety of challenging career fields to satisfy the needs a global economy (Association of Career and Technical Education, 2010).

Shop classes: A shop class was defined as a traditional vocation class such as wood working, auto mechanics, and plumbing ("Career Classes." 2007).

Assumptions and Limitations

It was assumed that the participants: (a) have been honest during the interview sessions; (b) were able to recall their experiences while taking CATE courses; and (c) were able to relate CATE to vocational education.

Limitations were used for the purpose of identifying the weaknesses of a study (Creswell, 2003). In this case study, I did not include participants who were taking or had previously taken CATE classes outside of ECCs study site. Teachers, administrators, and others in the school district were not included in this case study, as I focused only on high school graduates who took CATE courses during their high school curriculum. The study was further limited to the ECC's attendance area to help assure a satisfactory pool of participants for this study. Creswell (2003) explained that purposive sampling decreases the generalizability of findings (p. 148). The findings of this study are not generalized to reflect the experiences of all CATE graduates.

Delimitations and Scope

Delimitations in qualitative case studies were defined as the narrowing of the study's scope (Creswell, 2003). For example, a study may have focused on specific factors or variables, such as specific participants, type of research, or location (Creswell, 2003). The delimitations of this case study were as follows: (a) the participants were high school graduates, b) the research design was a case study, and (c) the study focused on students who took CATE courses at the research site. This study was delimited to the interview responses of 10 participants.

The scope of this study was specific to one high school offering CATE courses and specific to the high school graduates at the research site who were the focus of this study. I had no authoritative position over the participants selected from predetermined criteria. I did not (a) interview high school teachers or administrators, (b) observe school meetings or classroom, or (c) reviewed curriculum material.

Significance of the Study

The findings of this study may assist district administrators and teachers with CATE courses to help students meet their career goals. School and building administrator may use the recommendations of this study to improve the CATE program and its report card rating as required by the No Child Left behind Act of 2002. Policymakers may use the findings to evaluate CATE courses.

The findings of this study may also increased the awareness of CATE's potential benefits to high school students and may help education stakeholders by shedding further light on this important topic. Awareness of CATE may provide parents with an alternative educational choice for their children, which is less expensive and transferrable to most 4-year colleges. Researchers could use the findings to further examine how CATE affects the lives of students. Education legislators may use the findings of this study to make better decisions regarding the support of CATE. Business and industry stakeholders may find the findings useful to serve on advisory committees, as well.

Summary

In this section, I introduced the study about the experiences of 10 high school graduates who completed CATE courses at the research site In Section 2, I present the

current literature review on this topic. In Section 3, I discuss the research design, population and sample, and methodology for the data collection and analysis of this case study. The findings are presented in Section 4. In Section 5, I provided the interpretation of the findings, social implications, and recommendations for further research.

Section 2: Literature Review

The literature review is relevant to this study from several standpoints. The following topics were reviewed: (a) high school dropout rates, (b) history of CATE courses, (c) CATE courses and student learning, (d) CATE courses and youth employment, (e) benefits of CATE courses, (f) challenges of CATE courses, and (g) relationship between CATE courses and careers. Strategies for the literature review are discussed next. I discuss the definition of CATE, its origins, funding through The Carl Perkins Act, youth unemployment, relationship to student learning, and students' perceptions.

Strategies for Searching the Literature

In this study, several strategies were used to search the literature. Peer-reviewed articles, books, and reports were utilized to identify the gap in the literature concerning the perceptions of high school graduates of CATE courses. Keywords used in the search of this information included *vocational education, career and technology education, multiple intelligences, instructional methodologies*, and *learning and instructional theories*. These keywords were used to search databases such as ERIC, Education Research Complete, ProQuest, EBSCO Host, and Thoreau. Walden University's library provided access to all journal articles, online books, and reports. Archived statistical and demographical sources were retrieved from the State Department of Education and School Report Cards. Literature reviewed between 2005 and 2010 revealed that studies on the perceptions of students on CATE were limited.

Student Dropout Rates

According to Mndebele and Diamini (2008), CATE is a curriculum for minority students who are performing unsatisfactorily in the traditional curriculum. Students were leaving high school because they felt it was not relevant, and the high level of dropouts had a direct correlation to the closure of CATE classes in many career centers (Howlett, 2008). Bowers (2010) described a student being at risk of dropping out of school as one who had attendance problems, poor performance in classes, and discipline issues in school.

Some of the consequences of the high dropout rates have included health problems, crime, and dependence on government social assistance programs (Christle, Jolivette, & Nelson, 2007), such as welfare (Harvey, 2001). Students dropping out of school often accepted low paying jobs or stay unemployed (Christle et al., 2007). Dropouts employed during high school, had an average income of approximately $13,000 and accounted for 52% of welfare clients in approximately 2007. In addition, they accounted for 82% of the prison population and approximately 85% of juvenile offenders (Christle et al., 2007). According to Bracey (2006), dropout rates were at 50% or more, of which 50% were African-Americans and Hispanics (Marquez-Kenkov, 2007).

Participation in CATE may have compelled non college-bound students to complete high school (Plank, DeLuca, & Estacion, 2005). According to Plank et al. (2005), CATE helped high school students stay in school for many reasons to include: (a) connect academic and technical skills to real-life job-related activities; (b) provides learning that the student considers valuable, including the use of computers, tools, and

other job-related materials, (c) provides career focus that lends direction and motivation to stay in school; and (d) presents a variety of career choices that may motivate students to stay in school (Gray, 2004). CATE history will be discussed in the next subsection.

History of Career and Technology Education

Vocational education was an educational force using public schools to develop qualified laborers with technical skills (Passe, 2001). Vocational education began in the Renaissance and Reformation periods between the14th and 16th centuries when Martin Luther created an educational plan that, included trade education (Nagle, 2001). Day (2001) indicated vocational education started as specialized engineering schools in France in the 18th and 19th centuries.

Apprentice systems were introduced in the 19th century, and mechanics institutes were established from special schools or vocational education schools (Barlow, 1976). Nagle (2001) explained the Smith-Hughes Act was passed which provided funding for the construction of professional buildings to sustain and enhance vocational education for citizens 14 years old or older that have entered or will be entering the workforce (Nagle, 2001). Land grants were the result of the 1862 Morrill Act originally used to constructs technical schools. Today, these schools have provided CATE to students as an alternative education.

Hood (2005) described the differences between vocational and CATE as the blending of academic training and technology education. CATE courses provided students with an educational experience different from ordinary shop classes. U.S. Dept of Education (2007) indicated Presidents Clinton and Bush believed the Perkins Act was

vital to the CATE in United States. Next, I discuss the relationship between CATE and student learning.

CATE and Student Learning

In the next section we will discuss the definition of multiple intelligences, how students use multiple intelligences in CATE courses. Differentiated instruction will be discussed in relation to instructional methodologies and its use in CATE courses. Finally, self efficacy will be discussed as it relates to student learning, instructional methodologies and benefits to students.

Multiple Intelligences

The use of multiple intelligences helped students discover individual strengthens. For example, most high school students loved video games therefore, computer based instruction/assessment may have appealed to these types of high school students (Muncy, 2006). These students may have also loved assembling and disassembling machinery**.** Computer-based instruction with graphics appealed to these students and made learning more exciting (Muncy, 2006). CATE used practical and hands on training often using various activities, materials and equipment. Ozdemir, Guneysu, and Tekkaya (2006) indicated students in middle and high schools may utilize four multiple intelligence components at high levels. The multiple intelligence parameters were described as interpersonal, bodily-kinesthetic, spatial, and musical intelligences (Ozdemir et al., 2006). Spatial intelligence activities were selected for the student to examine pictures, diagrams and patterns to assist in learning (Ozdemir et al., 2006). Students benefited from peer instruction or remediation in which students discuss ideas, concepts, and thoughts

with classmates using interpersonal skills (Ozdemir et al., 2006). Because students enjoyed disassembling and assembling machinery as previously stated, hands on activities are used for the bodily-kinesthetic learner.

Improving students' engagement in literature was achieved through musical intelligence (Caswell, 2005). Music helped to bring out the emotions of the students who make a connection to the literary materials (Caswell, 2005). McCoog (2007) suggested to teachers to use educational technologies to instruct high school students using multiple intelligences. Students benefited from the use of databases, spreadsheets, projectors, whiteboards, and other materials. Internet searches and research projects appealed to the visual or spatial learner (McCoog, 2007). Software, with music synthesizers, stimulated auditory and kinetics learning styles. Students with interpersonal intelligences benefited from videoconferences, email, projects, and presentation (Ozdemir et al., 2006).

CATE students may have used multiple intelligences to create, repair, or perform problem solving activities (Muncy, 2006). Posner (2002) explained that 21st century education requires students to learn how to think, gather data, and formulate models. Student requiring additional instruction may have benefited from Howard Gardner's multiple intelligence learning theory (Muncy, 2006). Gardner (1999) suggested that intelligence was multifaceted and a bio-psychological ability to process information in a culturally varying setting to solve problems or create items of value in a particular culture. According to Gardner (1999), real-world activities will require varying types of intelligences.

Rettig (2005) explained the usage of multiple intelligences for the instruction of students with disabilities. Rettig also described computer-delivered, adaptive assessments to identify the strengths and weaknesses of students. Carducci (2006) reported types of learning theories applying to community colleges. Musical intelligence included the processing of sound, rhythms, melodies, and rhymes to engage in active listening and creating connections between music and emotions (Gardner, 1993). Kinesthetic intelligence included the thought processes in terms of bodily movement for expressive and goal-directed activities including a sense of timing, use of hands and coordination of body movement (Gardner, 1993). Because some students liked to disassemble and reassemble items as previously stated, hands on activities may have been in order for the bodily-kinesthetic learner (Gardner, 1993). CATE provided practical and hands on training often using computers, equipment, and tools of the trade. Speitel, Scott, and Gabrielli (2007) reported that after school programs can teach students mechanics and information technology through interactive and hands-on projects for students with disabilities.

Logical-mathematical intelligence dealt with the ability to calculate, quantify or consider propositions and perform complex mathematical operations involving inductive and deductive reasoning (Gardner, 1993). Interpersonal intelligence was described as interacting effectively with one or more people in familiar, casual or working conditions (Gardner). Interpersonal skills were very effective in getting students to work in groups for project based learning (ClanLin, 2008).

Technology integration needed to be applied to project-based learning (ClanLin, 2008; Page, 2006). Muncy (2006), ClanLin (2008), and Mahmoud and Walsh (2008) discussed the usage of various projects and activities to make the best use of multiple intelligence learning styles. Dal Bello, Knowlton, and Chaffin (2007) explained how special needs students may benefit from the use of videoconferencing, which can be found in some CATE classes. Demski (2009) reported that middle school students use videoconferencing to help motivate their interest in science and technology. Betteley and Lee (2009) reported that students use the Internet and other methods to learn about their learning style with those of earlier scientist. Buckenmeyer (2010) explained that the use of computers in the classroom can enhance both teaching and learning.

A student's use of intrapersonal intelligences may help them discover individual strengthens (Gardner, 1999). Interpersonally, students may have benefited from activities such as peer instruction or peer remediation to discuss ideas, concepts and thoughts with each other (Gardner, 1999). Interpersonal and intrapersonal intelligence were used to improve student achievement and the relationships through interacting with others (Gardner 1999).

The naturalist intelligence was in reference to the natural world including plants, animals and scientific studies or to interact effectively with other creatures and or natural forces (Gardner, 1993). Abisdris and Phaneuf (2007) reported that students can use a digital camera to study the effects of motion in addition to software and their imaginations.

Ozdemir et al (2006) reported that students in middle and high schools utilize multiple intelligence parameters at high levels (i.e., bodily-kinesthetic, spatial, and musical intelligences). Spatial intelligence activities were selected for students to examine pictures, diagrams, and patterns to assist them in teach (van Garderen, 2007).

Music may have been helpful in improving students' engagement in the classroom in literature (Caswell, 2005). Music helped to draw emotions and helped the student make a connection to the literary materials. Software with music synthesizers stimulated auditory and kinetics learning styles mentioned in this study. McCoog (2007) and Appana (2008) reported that to instruct students, teachers should use multiple intelligences via electronic devices. Merrell and Tymmus (2007) reported that the use of computers with adaptive assessments can help improve the reading comprehension in students experiencing difficulty in reading. Akbulut and Looney (2009) stated that the use of current technologies in the classroom can help promote student success. Gaming was a potential method to combine visual, technological literacy and keeping students interested in subject matter being studied (Clark & Ernst, 2009). CATE was a provider for future employees in the fast growing industries (Clark & Ernst, 2009).

Students benefited from databases, spreadsheets, projectors, whiteboards, and other materials (Lock & Kingsley, 2007). Rogers and Cox (2008) reported that the use of personal computer tablets can help students improve their note taking activities by improves studying skills. Colombo and Colombo (2007) discussed how blogs can be an effective method of delivering differentiated instruction to students.

CATE courses helped students utilize all of the multiple intelligences as they learn through various teaching methods to include drill and practice, cooperative grouping, peer instruction and one on one instruction. Students in a computer repair/Cisco networking class used visual clues to assist in troubleshooting a computer. The sense of sight was used to look at light indications, hearing to listen while determining drive activity. Touching a drive or testing the temperature would be an example of using the multiple intelligence of touch. A student would use the spatial intelligence to fit a card into a main board. Mann (2006) reported that teaching strategies are helpful while instructing special needs and gifted students with strong spatial abilities. The teacher would use drill and practice, lectures, hands on experiences, written problems, and various other instructional methods to instruct high school students better known as differentiated instruction. According to Shearer and Luzzo (2009), multiple intelligences were used to promote career development. Career development focused on three characteristics which are: (a) realistic self-appraisal of abilities, (b) understanding skills used in various types of work and (c) facilitation of true reasoning. People have varying types of intelligences; therefore they learned in different ways (Allan & Tomlinson, 2000). Schools should include student centered learning based upon the student's intelligence choice (Allan & Tomlinson, 2000).

Differentiated Instruction

Instructional methods and processes used to teacher to the learners needs were known as differentiated instruction. One method to provide opportunities for varying methods of learning was to utilize differentiate instruction. Differentiated instruction

dealt with the process of ensuring a student learns, knowing the student learns, the methods the student best demonstrated mastery and matching it to the student's readiness level, interest, and preferred mode of learning (Ellis et al, 2008).

According to Algozzine and Anderson (2007), differentiated learning originates from the differences in how a student learns their preferences and interest. Differentiated learning fell into the constructivist learning theories (Algozzine & Anderson, 2007). CATE instructors used various instructional methods in different phases of teaching. For example an automotive instructor may have used a chalkboard for visual and audible instruction. Then, the instructor may have transitioned to demonstrations, drill and practice and finally hands-on guided practice to name a few. This instructional methodology employed various instructional methods to fit the needs of the students. Levy (2008) explained how educators can meet the needs of all students and exceed standards using differentiated instructional methods. Williams (2007) indicated that differentiated learning can be enhanced through multiple intelligences for all students including special needs students.

According to Allan and Tomlinson (2008), Vygotsky indicated how a student feels towards learning or the perception of what they learn may impact the knowledge gained at that time or the future. Jimenez (2006) stated a student has to believe they can be successful in learning and mastering skills. This belief that a person had in themselves to be successful is known as self-efficacy, which was a social cognitive theory (Jimenez, 2006).

Social Cognitive/Self-Efficacy

One concept in the social cognitive theory was that people reacted or acted based upon actions previously observed and may shape a person's social behavior and thinking processes. Pajares (2003) stated that people's behavior or success can be predicated based upon their belief in themselves. A student's belief in his inability to learn the English language actually prevented the student from learning the language as described (McCabe, 2006). Bandura (2009) explained that people act or react to media such as television, other people's activities, and natural surroundings. Bandura (2009) reported that positive modeling can help to bring about positive changes in people's behavior and thinking patterns. Kolodinsky et al (2006) described how a job fair was used to improve the self-efficacy of female high school students to improve their interests in varying careers. Hall (2003) stated that self-efficacy is a vital component in assisting high school students to make career choices. Youth employment and its relationship to CATE were discussed in the next subsection.

Career and Technology Education and Youth Employment

Mndebele and Diamini (2008) explained why youth unemployment is rECC iving increasing attention from government and civil society groups. One of the main purposes of CATE was to prepare high school students for the challenges of adulthood. CATE courses have helped high school students with education to career options (McNalley & Harvey, 2001). Jones (2006) explained many jobs of the future would require personnel with high tech education. Murray (2007) discussed how congress allotted millions of dollars for advanced technology education designed to assist students in obtaining jobs in

the future job market. Nikirk (2008) described how Washington County Technical High School won the Maryland State Department of Education's Outstanding Secondary CATE Program Award of Excellence by implementing an innovative, creative and challenging learning environment teaching students using programs such as Sketch up from Google, Alice from Carnegie Mellon, and Adobe Flash. These CATE students aspired to become future video game developers, programmers, artist, animator or gaming business owners (Nikirk, 2008). Further discussions about the benefits of CATE followed in the next subsection.

Benefits of Career and Technology Education

The benefits of CATE are signified by improving student enrollment, decreasing dropout rates, and improving student attendance in school (Gray, 2004). One of the purposes of CATE was preparing high school students for the challenges of adulthood (McNalley & Harvey, 2001). CATE student organizations such as Skills USA enhanced a student's ability for self-determination and successful completion for high school (McNalley & Harvey, 2001).

Blackhurst, Auger, and Wahl (2003) described students in fifth grade as having developed an understanding of CATE concepts. Porfeli, Hartung, and Vondracek (2008) believed CATE should be made available to all students. The lack of career development in children has led to their disregard of career development (Porfeli et al., 2008).

According to Association for Career and Technical Education (2010), the benefits of CATE includes instruction in academic subject matter with real world applications and providing employment skills, career pathways to secondary and post secondary

education facilities, second chance training, additional certifications; and, degrees related to workplace training and career advancement. Silverberg, Warner, Fong, and Goodwin (2004) indicated that students taking CATE courses made substantial academic progress in reading and mathematics.

According to Waters (2008), CATE helped students in K-12 realize the relevance of an education. CATE provided courses that help students prepare for post secondary education. Knowledge was defined as learning, which was relevant to a community of practice or other groups (Cree & McCauley, 2000). CATE helped students become part of community of practice as they aspired to become tradesman, technicians or journeyman in their fields (Cree & McCauley, 2000). Learners should feel that the time and energy used in education should not only be relevant, but also worthwhile (Cree & McCauley, 2000). Another component of CATE is known as school-to-work designed to help young people obtain skills needed to enter the labor force (Hughes, Bailey, & Tarp, 2002; Muller & Gangl, 2003).

According to Diehl, Hoffinger, and Weisstein (2002), school-to-work was demonstrated in Massachusetts as an educational path for student seeking to go into the work force. School-to-work was a program for the development of academic and technical skills for at risk students, reducing dropout rates and dependence on social programs (Ainsworth & Roscigno, 2005; Maxwell & Rubin, 2000). CATE participation appeared to be correlated with higher levels of attendance and Texas Assessment of Academic Skills performance in general (Oswald, 2002).

School-to-work training helped students to compete in the global economy. School-to-work helped high school students to develop work experience (Harkins, 2000). School-to-work was being implemented in Canada and The United States of America (Schuetz & Sweet, 2003). According to Donlevy (2002), United Parcel Service provided an internship programs to help students or disadvantage people gain on the job experience.

According to Braxton (2001) and Mobley (2001), CATE was designed to offer students the opportunity to gain job skills which can be valuable for students choosing to not attend a 4-year college. CATE classes offered students remedial academic training, job and technical skills training which can be used in their career fields of choice.

According to Hood (2005), many students may not be able to make the connection with basic skills and real life education. CATE may have provided the remedial skills for high school students to make the connection between academics and real world experiences as indicated (Hood, 2005). Once high school students are able to "make the connection" they may be successful in high school and wish to move on to facilities of higher learning. Silverberg, Warner, Fong, and Goodwin (2004) indicated that over the last decade, students who participating in CATE programs have increased their academic course takings and achievement levels. Teaching technology education allowed students to use their minds and hands and brought excitement into the classroom (Weaver, 2005). Technology education helped students learn skills in reading, mathematics, social studies and science (Weaver, 2005). Robotics competitions were described as another method in which CATE can be used to add excitement to the

classroom and help students become interested in high-tech learning (Johnson & Londt, 2010). Caron (2010), Zhi Feng, Chun Hung, and Chiung Sui (2010) and Ewers (2010) reported that robotics can be used to motivate students to perform better in science, engineering, and technology. Haskell and Haskell (2010) explained how working with students in a CATE center provides students with unique opportunities to help them prepare for their career goals.

CATE in a post secondary facility such as a technical college may be shorter and less expensive than most colleges (Mupinga & Livesay, 2004). Technical colleges offered a wide range of programs (Mupinga & Livesay, 2004). There are many jobs for CATE students in many career fields such as plumbing, electricians, carpenters, bricklayers, electronics and high tech jobs (Hood, 2005). Two writers on the subject of CATE stated it could very well be one of the answers to decreasing school dropout rates (Cassidy, 2007; Gray, 2004). CATE courses benefited students by providing hands on education that helps keeps them in school (Cassidy, 2007).

CATE courses may have prevented student dropout by providing hands on training that could makes the connection to real life experience (Harvey, 2001; Stone, 2004). CATE was an educational tool which may have helped special needs high school students stay in school and become completers (Harvey, 2001). The disadvantages of CATE were discussed in the next subsection.

The Disadvantages of Career and Technology Education

CATE was often overlooked as a logical choice for a post-secondary education (Mupinga & Livesay, 2004). CATE was not considered by some school and building

administrators as a logical choice for education (Gray, 2004). CATE was described as being on the lower spectrum of the educational pole (Winch, 2000). The problem of this lower status affected CATE funding on various levels of government, which included state, and federal governments. Students taking CATE courses were historically considered low achieving and non-college bound (Silverberg, Warner, Fong, & Goodwin, 2004). KO (2005) indicated that the retention rates of career and technology students in higher educational settings add to the negative stigma of CATE. Gender bias was another problem associated with CATE (Arubayt, 2009). Many female high school students opted to take courses such as cosmetology, health occupations, and home economics while males may take courses such as auto mechanics, masonry, electronics and the like (Arubayt, 2009). Dakers, Dow, and McNamee (2009) stated females are significantly underrepresented in CATE education. Miliszewska and Moore (2010) described strategies designed to improve female participation in CATE courses.

Another critical cause of low enrollment in CATE courses was due to a strong negative stigma placed on CATE courses (Mndebele & Diamini, 2008). CATE courses were perceived as dead end for students who are hesitant to enter school because of difficulty with a more rigorous academic curriculum (Mndebele & Diamini, 2008). Hindi, Khasawneh, Qablan, and Al-Omari (2008) cited the unawareness of the benefits of CATE, peer pressure, scheduling issues, discouragement from teachers and school administrators were some of the reasons why enrollment in CATE courses may be low. In addition, CATE teachers were not given credit for providing high school students with basic skills training (Litowtiz, 2009). High school students learn mathematics in a

technological environment then, apply the theory in a real life environment (Stone, 2004). Teacher perceptions of CATE to students often discouraged them from aspiring to take CATE courses which may contribute to the demise of technical schools (Karmel, 2007). The relationship between the business, industry, and a nation's economy will be discussed in the next subsection.

Relationship between Business, Industry, and a Nation's Economy

Business and industry plays a large part in CATE yet, small businesses were reluctant to participate in CATE (Jones, 2006). According to Fields (2008), high school students joining the workforce can help generate revenues to improve a nation's economy.

CATE could have important implications for the U.S. workforce and America's place in the global economy (Silverberg et al., 2004). CATE was one of the tools for improving a nation's economic, social, and environmental development (Helm, 2005; Khasawneh, Olimat, Qablan, & Abu-Tinch, 2008). Silverberg et al. (2004) indicated CATE has short to medium term earning benefits for high school students and extend to students who may be economically and educationally disadvantaged, and students with disabilities. High School students taking CATE courses rECC ived an education which is less expensive which may result in many of those students hold high paying jobs and serving in supervisory positions without having a bachelor's degree (Hudson, 2008). High school students taking CATE courses were more likely to pursue higher degrees which may help to close the achievement gaps with academic high school students (Lewis, 2006).

Perry and VanZandt (2006) reported that tips, checklist, and steps are needed to instruct students on how to use CATE to help them obtain their career goals. Rapid economic changes and unemployment rates are calling for educational reform in which school to work training for high school high school students is vital to prepare them for future workplace assignments and help them compete in the global economy (Schuetz & Sweet, 2003). CATE has been considered as crucial and indispensible in the progression of economic development in Taiwan in the last ten years (Yin-Che, Yun-Chi, & Ya-Lun, 2008). High school students took CATE courses because students found CATE courses interesting and it provided hands on training (Dalley-Trim, Alloway & Walker, 2008).

Student Achievement

Career and technology education improved a student's likelihood of completing high school (Harvey, 2001; Stone, 2004). Harvey (2001) also stated that CATE can be an instrumental tool in helping special needs students stay in school. Cassidy (2007) and Gray (2004) indicated that CATE helped students stay in school. CATE provided the remedial skills for high school students to make the connection between academics and real world experiences as indicated (Hood, 2005). In turn, they become motivated in learning and being successful (Hood, 2005).

Oswald (2002) stated that students who participated in CATE classes showed higher levels of improvements in attendance and general school performance on the Texas Assessment of Academic Skills. Silverberg, Warner, Fong, and Goodwin (2004) stated students taking CATE courses made marked academic progress in basic skills such as reading and mathematics. Career and Technical Education (2010), expressed one of

the benefits of CATE was that instruction of academic subject matter with real world applications was employed making learning more relevant to students. CATE helped students learn skills in reading, mathematics, social studies and science (Weaver, 2005). High school students taking CATE courses were more likely to pursue higher degrees which may help to close the achievement gaps with academic high school students according to a report by Lewis (2006). CATE students were inspired to become programmers, artist, animator or business owners (Nikirk, 2008).

According to Tang and Austin (2009), a different mix of technologies such as those used in CATE classes promoted learning for students and satisfied their needs and objectives. Jokic, Pardanjac, and Radosav (2009) stated new technologies in classrooms can be a great motivator for student learning. Strategies outside of the regular classroom played an important part in students' success for example, Huang, and Cho (2009) explained how an effective after school homework program can help improve student success. When students can attended an after school homework program where certified teachers can work with them in one on one or small groups, students can rECC ive vital assistance in their school work.

School districts, local and state governments played a large role in student success, Hunter (2009) indicated that government entities should take steps to ensure all school and students have equal access, materials and supplies to ensure success. Students in poorer districts rECC ive less funding. Less funding meant the availability of after school programs, academic programs and equipment may not be available. Communities with a larger tax base usually afforded academic programs more so than those with a

lower tax base. Formulas for calculating per pupil spending required adjusting to make education equitable for all students.

Instructional Effectiveness and Student Success

The importance between effective instruction and student outcomes had been well documented. Sanders and Horn (1998) indicated that the factor affecting the academic growth is the effectiveness of the individual classroom. Effective differentiated instruction was essential for schools that meet achievement targets (Stichter, 2009). The effects of instruction as measured by student outcomes were strong classroom management and an increase in the number of student opportunities to reason (Brophy & Good, 1986; Kern & Clemens, 2007; Southerland, Adler, & Gunter, 2003; Sutherland, Wehby, & Yoder, 2002). According to Brophy (1982), effective instruction included better than average classroom management, high expectations of the students, active teaching, and curriculum pacing and teaching to mastery. Instructional talk, or active teaching, encompassed the presentation of academic information and the development of concepts through lecture and demonstration, coupled with elaboration in the form of discussions and practice examples (Brophy & Good, 1986). Academic programs encompassed the presentation of academic information through both lecture and demonstration (Stichter, 2009). Student autonomy was described allowing students to be creative about their learning can be an instructional method which can motivate students to learn (Jankowska & Atlay, 2009).

Two of the most consistently purported instructional practices for the classroom environment thought to positively impact the effects of instruction as measured by

student outcomes were strong classroom management and an increase in the number of student opportunities to reason (Brophy & Good, 1986; Kern & Clemens, 2007; Southerland, Adler, & Gunter, 2003; Sutherland, Wehby, & Yoder, 2002). Within this literature base, effective classroom management was defined as those general environmental and instructional variables that promoted consistent classroom-wide procedures and setup (Brophy & Good, 1986; Kern & Clemens, 2007; Southerland, Adler, & Gunter, 2003; Sutherland, Wehby, & Yoder, 2002).

Teachers should conduct themselves in a professional manner in and out of classes as their behavior makes a difference in student success (Brophy, 1986). According to (Danielson, 2002), quality teaching was the most important single factor affecting student learning. Quality teaching was defined as what the teacher does in the classroom, which is about student learning or student success (Goe, 2007). Teacher efficacy, instructional delivery, active teaching and enthusiasm for the subject being taught were some of the things which make a quality instruction/teacher.

Martin and Dowson (2009) explained that interpersonal relationships between students and teachers can be instrumental in helping improve student success. Students often responded positively to teachers who care about them (Martin & Dowson, 2009). Perhaps a friendly good morning or salutation helped made a student's day. Encouraging words or a belief that a student can perform motivated a student to work harder or perform better in their studies. Ozden (2008) indicated that there is a relationship between teacher pedagogical content knowledge and student success. Student can experience academic success when they feel safe, important and wanted by the classroom teacher.

The combination of skills such as essential knowledge, commitment and disposition made up a portion of these pedagogical standards. These items are only a portion of what makes a quality teacher. Strong subject matter makes a difference too..

Darling-Hammond and Bransford (2005) and Lyon and Weiser (2009) reported that teachers possess strong subject matter knowledge and a basic understanding of how people learn and develop along with content knowledge. Pacing involved the speed at which an instructor teaches his subject area. Pacing included the arts of regulating the flow or speed of instruction to meet the needs of all students (Brophy, 1982). Instruction of specific subject matter to diverse students, managing the classroom, assessing student performance, and using technology in the classroom were also crucial in education today (Brophy et al, 1982). Students are technologically inclined and instruction should be designed to meet their instructional needs leading to student success. Paper and pencil assessment are appropriate when needed; however, a written assessment is not always a true measure of a student's ability. Teachers should use varying assessment instruments such as contest, or assessment using technology.

Downey, Prase, Paston, and Steffy (2003) described 50 strategies that can close the achievement gap. One of the many methods includes equality in instructional and the use of instructional materials. School districts should make sure all schools have adequate amount of textbooks and materials to assure student success. This should be performed regardless of race or socio-economic levels of the students being served. Ensuring class sizes are balanced based upon ability levels.

Katz and Stack (2008) conducted a study to determine when an English exam or English learners exam should be administered. A written examination is not the only way a student performance can be evaluated but, practical examinations, projects and other methods of assessment can be employed to determine a student's mastery or ability to perform. According to Haycock (2005), a coherent curriculum may be used to help assure every teacher teaching a specific class may be using the same materials or textbooks used by another instructor of the same subject.

Teachers and school administrator can learn about differentiated instruction, instructional methodologies and other research based learning methodologies through staff development activities. Parrish (2007) reported on an instructional design known as aesthetics of instructional design. In this design, instruction has a beginning, middle and an end, the student is a leader in their education, learning activities are the themes of instruction, context is the major factor in the immersion of instructional situation and instructors are leaders or main characters for instruction. Instruction begins with the introduction of the subject materials, in the middle students may manipulate information or find ways to comprehend the materials and finally the assessment would be the final phase of instruction to determine the learner's knowledge. The student being the leader of their education places the responsibility of the learning on the student to learn in a way that best suits for them. Teachers have to be taught these varying methodologies of teaching for them to be successful. Teachers may gain this valuable knowledge through staff development. Hacker (2007) indicated staff development as an effective tool in training school staff on new technologies, instructional and assessment methods. Staff

development can be accomplished on site at schools or other facilities to deliver training in curriculum development, classroom management.

Teachers can attend staff development sessions and complete assignments, participate in peer assessments, or peer instruction activities to assess or improve instructional methods which can lead to student success. An example of a school or teacher improvement model that can be performed through staff development, which is a collaborative model called the active team/active mentor philosophy (Glatthorn, Jones, & Bullock, 2006). This model is about the work of team and mentor to cooperatively improve the school and develop the new teacher. New teachers have to develop skills and process that cannot be taught in teacher education programs (Glatthorn et al., 2006). New teachers can quickly become overwhelmed by classroom management issues, district policy they may not understand, or everyday school operations. Providing new teachers with a mentor or mentoring team can help new teacher get through a difficult year (Glatthorn et al., 2006). This model can be very effective to grooming quality instruction which in turn can make a quality instructor (Glatthorn et al., 2006).

Heneman III, Kimball, and Milanowski (2006) indicated there was a relationship between teacher self-efficacy and student success as a teacher must believe they can teach the subject material but also that they are have vast knowledge of the subject matter. If a teacher does not believe they have content knowledge of a subject being taught, then that teacher will not deliver quality education to the student (Heneman et al., 2006). Poor quality instruction can result in poor student performance. Teachers that have mastery of the subject matter they are instructing will instill confidence in the students

(Heneman et al., 2006). When students believe the instructor is an expert in the subject matter being taught then students will be motivated to learn and perform (Heneman et al. 2006). Every now and then a teacher or district may decide to put in place an exam exemption policy, which allows students to exempt a semester or final exam. Jennings and Beveridge (2009) examined the academic benefits of students being exempt from exams. Based upon the results of the study, students scored higher when they were required to take the exams. Jennings and Beveridge (2009) also stated that over inflated passing rates were possible which affected African-Americans and Hispanics students. Students exam exemptions may help improve achievement if properly administered by setting a grading criteria and sticking with it.

Differing Methodologies Relevant to this Study

Previous studies on CATE have employed various research designs. Choi (2009) conducted a qualitative study that examined the perceptions of former high school students in college level Information Technology (IT) programs by using a grounded theory design. This methodology was chosen due to the bottom-up approach of emerging themes from collected data. Data were gathered through a qualitative interviewing process conducted with 28 undergraduate students, who have taken one or more IT classes. The interview data were analyzed using the grounded theory approach. The result of the study indicated that college students perceived that they were very competent in dealing with IT primarily due to their continued exposure to computers since youth. Choi's (2009) study was similar to this study in data collection will be performed through interviews, both studies are studying the perceptions of the participants and they are of

the qualitative nature. This study's qualitative design, processes and analysis was described by Creswell (2007) as the processes included interviewing participants, and the grounded theory approach for data collection to name a few parameters.

Curtis (2009) conducted a mixed methods study which examined a correlation between high school students taking CATE courses and dropout rates. This case study was conducted to determine if there are were correlations between CATE course participation based on three diploma types: College Prep, Tech Prep, and the diploma type including both College Prep and Tech Prep requirements. Curtis (2009) assessed if and how these correlations affected academic achievement and the likelihood of dropping out of high school. The study utilized quantitative research processes to determine if and how these correlations affect academic achievement and the probability of students dropping out of high school. Qualitative research methods were used in an effort to find ways to improve current CTE courses and programming specific to the case study setting. The sampling method used for the research included the researcher randomly selecting a class of high school students entering high school. The students attended high school during the 4 years 2003-2007 during this period of time the aforementioned students were involved in the case study to determine if there was a correlation to students taking CATE courses and the probability of dropping out of school. The study findings indicated there was a correlation to students taking CATE courses and the dropout rates of students. Students who have taken CATE courses were less likely to drop out than students who had taken no CATE courses. This study is non-conventional to my study as

it involves both a mixed methods process which includes a case study which occurs over a specific period of time.

McCaskey (2009) conducted a descriptive quantitative study to identify the teaching styles and learning strategy preferences of secondary CTE teachers. McCaskey (2009) examined variables relating to teaching-learner activities for teachers with various educational backgrounds. In addition, McCaskey (2009) examined the relationship between teaching styles, demographic variables and the relationship between learning strategies and demographic factors CATE teachers. Sampling included members of the Illinois Association of Career and Technical Education (IACTE). Many of the participants were female between the ages of 20 and 73 with highest percentage of being between the ages of 51 and 55. Participants involved in this study were members of the Illinois Association of *Career* and Technical Education (IACTE) at the time of the study. Demographic data revealed most respondents were female and age varied between 20 to 73 years with the highest percentage of responses being between the ages of 51-55.

Two standardized instruments and a questionnaire assessment were employed to address research questions in the study. The Principles of Adult Learning Scales (PALS) was the first instrument utilized which assisted in identifying the teaching style of an instructor. The second standardized method is known as (ATLAS) Assessing the Learning Strategies for Adults which assesses adult learning styles. The finding of the study placed the participants in one of three categories of teaching styles: Problem solvers (46.3%), engagers (33.9%) and navigators (19.8%) in order as reported

(McCaskey, 2009). This study was non-conventional to mine as this study employs a descriptive quantitative design using an online assessment tool.

According to Sinclair (2006), who utilized an experimental quantitative research design in which he compared three instructional methods for delivering CAD Instruction for continuing education students, and established a comprehensive cognitive profile matrix of continuing education students taking CATE courses. The independent variable was the instructional method and the dependent variables were the academic achievement scores and satisfaction levels of students. No significant correlation existed between the achievement and learning styles of the students. The results indicated that overall academic achievement within the subject of CAD was equal for all cognitive profile categories.

Ernst (2006) used a quantitative research design to survey technology teachers in North Carolina. This study's purpose was to assess the degree of instructor usage of effective instructional elements in a classroom environment for individuals with specific learning disabilities enrolled in high and low achieving North Carolina CATE programs (Ernst, 2006). The sampling included 45 special needs teachers identified as having low and high achieving students with learning disabilities. Ernst (2006) concluded the demographic variables were gender, years as a technology educator, and years as a high school technology educator as significant differences between groups. The study found that 4 effective instructional elements.

According to Ratzlatt (2007), who employed qualitative research design, the perceptions of high school students with learning disabilities towards self-determination

in CATE courses were positive. The sample was four high school students who were interviewed to determine their levels of self-efficacy in CATE courses (Ratzlatt, 2007). This study was similar in that both are qualitative studies utilizing interviews to obtain the perception of participants.

Copeland (2008) employed a mixed methods study in which 81 CATE Center directors rECC ived an e-survey. This study's purpose was to examine the issues and implementation of high school reform efforts in the 81 *careers* and technology schools in the Pennsylvania. The sampling population included 81 CATE Center Directors with 79 directors responding to the study. Copeland (2008) collected data from 81 CATE Center directors and found there is a lack of communications between CATE schools and their school districts. Copeland (2008) also found that comprehensive CATE schools were more actively engaged in school reform than shared-time CATE schools. Copeland's study, unlike mine, did not employ a qualitative process and uses an email survey to collect data.

Tolan (2008) utilized a two phase exploratory sequential mixed methods design to study the experience of technology educators participating in Project lead the Way. In phase 1, a qualitative design was used where teachers were asked to describe their rationale for working in CATE, their career experiences. In Phase 2, technology teachers described their CATE Career choices and rationale for their choices. The independent variables of gender and technology teaching entry point were used. In this study, 65% of the participants entered the technology teaching profession changing careers from industry or other teaching disciplines. Findings about gender in the technology teaching

profession indicated factors that attracted participants into the technology teaching field, and paths taken to enter into the technology career vary when compared to other teachers. This study differs from my study in that it employed a sequential mixed method design in various phases.

Landon (2009) utilized a mixed methods study design such as open ended questions and a Likert scale survey. Landon (2009) designed the study to identify: high demand occupational skill requirements; current training services; changing trends based on technology, competition, and workforce composition; and the need for partnerships. Landon (2009) found that of the 22 workforce development leaders surveyed 19 listed healthcare as the highest in-demand occupational need in their area. Following healthcare, technology was also considered a high demand skill training area. This study differs from my study in that it utilized a mixed methods approach using a survey.

Fletcher (2009) used a descriptive and inferential statistical research design. This study was to investigate the relationship between high school curriculum tracks and student achievement outcomes through the consideration of degree attainment and occupational earnings. Three questions were analyzed in which a multinomial logistic regression analysis was used to analyze the first two questions and a multiple regression analysis was used for the third research question (Fletcher, 2009). Fletcher (2009) found the Carl D. Perkins Vocational and Applied Technology Education Act of 1990 not satisfactorily achieving its objectives in terms of CATE students achieving their postsecondary degrees. Fletcher (2009) found that CTE students were outperforming students in other educational tracks in terms of occupational earnings.

A quantitative study of 58 CATE teachers was conducted by Davis and Davis (2007) to determine their perception of their personal computer knowledge and skills. The instrument used for data collection in this study was a Likert scale type instrument. Participants were selected from a group of prospective CATE teachers (Davis and Davis, 2007). The study findings indicated there were no significant differences in gender (Davis & Davis, 2007). The study did show a difference between perceived competencies with participant's age groups (Davis & Davis, 2007). This study differs from my study in that it used a Likert scale instrument for data collection while I utilized participant interviews. Buehl and Fives (2009) conducted a quantitative study in which open ended questions were analyzed to determine the beliefs of teaching knowledge. The finding of the student concluded that participants held numerous beliefs regarding six teaching theories (Buehl & Fives, 2009). The sample for this study included 53 upcoming and 57 practicing teachers (Buehl & Fives, 2009).

Easton-Brooks and Davis (2009) conducted a quantitative study which consisted of the Value Added Model. This study was to examine the varying effects of teacher qualifications on the reading achievement of African American and European American students from kindergarten to third grade (Easton-Brooks & Davis, 2009). The finding of the study was that students with a certified teacher during their early school years scored higher in reading than students who did not have a certified teacher (Easton-Brooks & Davis). The analysis used a two-stage process to determine whether teacher qualifications were associated with initial reading at kindergarten and with growth in reading, and

narrowing performance gaps between African American and European American students at different socioeconomic classes.

Furtak and Ruiz-Primo (2008) conducted a quantitative study with a sampling from six middle school science teachers and their students. The sample included randomly selected teachers and classes. The student class sizes ranged from 20 to 31 students. The study was of an experimental type. The study used two formative assessments: (a) Reflective Lessons Type I consisted of four formative assessment prompts (Graph, Predict-Observe-Explain, Short-Answer, and Predict-Observe) and (b) Reflective Lessons Type II were concept maps to check student's understanding of a specific lesson unit (Furtak & Ruiz-Primo, 2008). The findings of the study were that students had higher adherence levels in Reflective Lesson Type 1 than Reflective Lesson Type 2. Gimbert, Bol, and Wallace (2007) performed a mixed methods study with a comparative design. The findings of the study indicated a significant difference with preference towards an alternative preparation for teacher on two measures of student achievement as well as the use of standard-driven instructional strategies (Gimbert, Bol, & Wallace, 2007). Data were collected from standardized state assessments and district data assessments (Gimbert, Bol, & Wallace, 2007).

Koppick and Humphrey (2006) performed a mixed methods study in which a case study of 16 low performing schools was conducted across three states. The objective of the study was to learn more about National Board Certified Teachers' motivations, roles and activities in schools (Koppick & Humphrey, 2006). The study consisted of a sampling of board certified teachers. The participants came from six states with the

largest number of National Board Certified Teachers (Koppick & Humphrey, 2006). The study showed that National Board Certified Teachers are less likely to be working in the schools that serve poor, minority, and low-performing students than in schools that serve more advantaged students (Koppick & Humphrey, 2006). This has a negative effect on low performing schools due to the best teachers preferring to teach at more affluent schools which can have a negative effect on student achievement (Koppick & Humphrey, 2006). School district may place incentives to draw national board certified teachers to teach in low performing schools.

Summary

The main focus of this study was on determining why CATE help students achieve their career or post-secondary education goals. Vocational education has been the forerunner for providing job training since the 14th century (Nagle, 2001). CATE was created to address the issues of providing basic, employment, and technical skills to prepare high school students for the career goals of their choice (Hughes et al, 2002). CATE was seen as a lesser form of education for high school students who cannot perform well in traditional education setting (Mndebele & Diamini, 2008). CATE helps high school students see the relevance of education to employment Stone III (2004). Harvey (2001) and Stone III (2004) indicated that CATE can help prevent student dropout by providing hands on training that could makes the connection to real life experience.

In Section 3, the methodology for this case study is presented. It includes a description of the methodology and the research design. Settings, participants, treatments

are also presented in Section 3. Instrumentation, data collection processes, and analysis methods are summarized. My role in the collection of data and analysis and methods used to protect participants' rights.

Section 3: Research Method

A case study was utilized. In-depth structured interviews were conducted with 10 high school graduates who took CATE courses in 2010-2011 school years. The participants were invited to participate in face-to-face interviews that focused on understanding the perceptions of the participants of CATE courses. The findings shed further light on how to enhance CATE courses for careers of high school students who have taken CATE courses. Next I discuss the research design and explain why a case study research design was selected.

Research Design

A case study was selected because this research design involved the researcher exploring in depth the perceptions of CATE courses participants (Creswell, 2003). I utilized a case study design to understand the perceptions of 10 CATE course graduates of the impact of those courses on their career goals (Creswell, 2007).

According to Baxter and Jack (2008), qualitative studies afford researchers the opportunities to explore a phenomenon in context using a variety of data sources. As expected of qualitative researchers, I needed to connect the interview data of my study to the findings (Yin, 2009). I ensured that the research and the evidence that was collected would address the research question that guided this study. My case study was designed to contribute to understanding a group of 10 graduates of CATE courses.

Other research methods were considered. The grounded research design was not selected because this design includes an abstract theory of a process, action or interaction grounded in the views of participants in the study (Creswell, 2003). The

phenomenological method was considered but not selected because phenomenological research method identifies the "essence" of a human experience. I did not select this research method because the essence of a human experience may involve emotions, thoughts, opinions, or physical attributes (Hatch, 2002).

The phenomenological research design involved a study of a small number of subjects extensively and over a prolonged period of time to obtain patterns and relationships (Hatch, 2002). In my study, I did not examine human feelings, mental, emotional or physical attributes over a prolong period of time to gather data from participants. Therefore, this research design was not selected. The objective of this study was to understand whether CATE was instrumental in preparing high school students for a secondary education or assisting them to reach a career goal.

This case study design allowed me to collect data through interviews using open-ended interview questions with the participants. A set of prescripted, open-ended questions was utilized during the interviews to obtain information about the topic. The qualitative case study designed was appropriate for this study because this design supported the case for the mobilization of stakeholders at the research site for successful careers of high school graduates whom have taken CATE courses (Merriam et al., 2002). Individual interviews were conducted at the research site. The interviews were audio taped and later transcribed for final analysis.

Research Question

The research question that guided this study was as follows: What are the perceptions of high school graduates of a CATE program?

Context of the Study

Between 2010 and 2011, there were 945 high school students enrolled in ECC. There were 107 freshman, 298 sophomores, 337 juniors and 203 seniors. Racial composition of the school included 106 Caucasians, 762 African-Americans, 14 Hispanics, and 62 high school students of other nationalities. More than 85% of the high school students at this site were identified as socioeconomically challenged. Dollars spent per pupil was $4,838, which was the same across the board as in April 2010.

At the time of this study, there were 16 CATE instructors at the school, which included 3 Caucasians, and 13 African-Americans. Four teachers held advanced degrees, including Masters, Masters + 30, and doctoral degrees. Ten teachers held continuing contracts, and the teachers' attendance rates were at 95.4%. The average teacher salary was $48,436 (Career and Technology Centers at Work, 2010*)*. The school district had 12153 students enrolled, 50.03% male and 49.97% being female. There were 18.752% Caucasian high school students, 76.93% African-American students, .954% Asian American students, 2.81% Hispanic students, and .065% Indian/Alaskan students. The district served 1918 students with disabilities and, 266 Limited English proficient students. The district provided free or reduced priced lunches to 8431 students.

Protection of Human Participants

Participants in this case study were CATE students who were 18 years of age or older and who consented to participate in the study. Each participant rECC ived a consent form, which was signed before the interviews. Participants were informed of their rights to withdraw from the study at anytime and provided them with the appropriate

documents to sign. This case study did not involve any type of medical, physical, or emotional experiments, and thus no risk to the participants existed. Furthermore, there were no risks in regards to employment, personal, financial or type of risk. Interview data were extracted, placed on compact disk, and locked in a file cabinet. Participants were coded as Participant 1 (P1), Participant 2 (P2) and so forth during the interviewing phase and reporting of the findings.

The participants had the right to withdraw from the study at anytime. All documents required by law and the IRB of Walden University were completed and will be kept on file for at least 5 years.

Role of the Researcher

My role in this study was that of a researcher. I conducted the interviews for this research study. In order to accomplish the researcher-participant relationship, I informed each participant of her or his rights to participate in this study. No compensation was provided to the participants. During this research study, the participants were not my students. These participants had already graduated from ECC; therefore, no authoritative role existed between the participants and I. I was not employed by the ECC.

Population and Sample

In this case study, participants were selected based on these selection criteria: Each participant had(a) had taken a CATE course, (b) was at least 18 years old, and (c) signed a consent form agreeing to participate in the study. The interviews were conducted in a comfortable place selected by the participants.

The participants were invited by the ECC Guidance Department to participate in this study. Only the participants who met the selection criteria were invited by the administrator responsible for research at the research site. The guidance director invited 40 CATE students because they met the selection criteria. Of the 40 potential participants, 10 agreed to participate in the interviews and signed a consent form. Those 10 CATE students were interviewed three times for1 hour per interview. Each participant was asked the same interview questions. An interview protocol was utilized (Appendix A) during the face-to-face interviews. I recorded the interviews with the permission of each participant. I transcribed and coded the interviews (Czarniawska, 2004).

Data Collection and Instrumentation

All high school graduates who had taken CATE courses at the research site and were at least 18 years old were eligible to participate in this study. The interviewing process started upon approval from Walden's IRB # 07-05-11-0074809 and the study site administrator. Data were collected from 10 graduates of CATE courses via face-to-face interviews in a comfortable place for the participants. I recorded each one-hour-interview using a digital recording device using a laptop computer. All interviews were conducted as scheduled and no interviews were cancelled or postponed. Audio data were transcribed concurrently over a period of 5 business days with follow-up audio replays and several written drafts for accuracy. Data were saved on my laptop and a thumb drive. Each participant was asked to sign a consent form.

Data Analysis

When the interviews were transcribed, the analysis process consisted of reading through the data to obtain a general sense and meaning of the information (Creswell, 2003). Transcripts were analyzed to provide a detailed description of the setting and individual with an analysis of the themes (Stake, 1995; Wolcott, 1994).

I reviewed each interview question to get the main idea while reading and coding transcripts. I grouped the code words around a particular concept in the data, called categorizing, and reduced the number of code words with which to work (Merriam et al., 2002). The code theme/category identified the most descriptive wording for the topic (Creswell, 2003, p. 192). I reviewed each interview transcript line by line and I assigned a code to represent themes (Merriam et al., 2002). I used codes such as CATE + (positive), CATE - (negative), and CATE (neutral) (Baxter & Jack, 2008; Janesick, 2004; Yin, 2009) for the data analysis. An example of coding is found in Appendix D. I utilized member checking to ensure the accuracy of rich, thick, detailed descriptions (Creswell, 2003). Member checking helped me support the transferability of a solid framework based on the participants' responses and researcher's interpretation (Merriam et al., 2002), which was used in the second interview.

The data analysis consisted of the following steps: First, participants were assigned a code to ensure their confidentiality. The code started with: CSP (case study participant) followed by a number to identify the fist participant such as CSP1, the second participant as CSP2, and so forth. Second, I obtained permission from each participant to record their interview; responses were coded as CSP 1-R1, CSP 2-R1 and

so forth (Case Study Participant 1 Response 1, Case Study Participant 2-Response 1) and coding was assigned to each participant's responses; Third, the participants were invited to two additional interviews to ensure the accuracy and validity of the data rECC ived as the researcher may ask the participant to provide additional information for clarification; Fourth, I then transcribed each participant's responses, placing them in categories such as R1, R2 and R3, which included the respective responses from all participants; Fifth, I typed all responses using Microsoft word; Sixth, I analyzed all data looking for commonalities such as patterns, themes, and relationships; Seveth, I utilized Atlas ti-6 analysis software to perform an analysis on the data; and Eighth, I analyzed the data and ran a computerized data analysis using the Atlas ti-6 software for the final data analysis.

Discrepant Data

I considered discrepant data by searching the data set for data that contradicted the potential findings. Upon examination of all data collected, I found no discrepant data as all participants indicated that their input was exactly what I had recorded and interpreted by using member checking.

Evidence of Quality

I consulted with a panel of experts in the CATE field to evaluate the interview protocol and provide me with their feedback. The panel of experts consisted of two CATE teachers, two principals of schools offering a CATE program, and two professors with expertise in qualitative research. This process allowed these experts to examine my interview protocol (Creswell, 2007). Based on the feedback from the panel of experts in the CATE field, I revised the interview protocol. The panel suggested that I ask questions

specific to CATE and their classroom experiences. After I revised the interview protocol, I gave a copy of the revised interview protocol to the same panel of experts for further feedback. No revisions were suggested by the panel of experts. As a result, I utilized the interview protocol (Appendix A). The experts assisted me in ensuring the questions were clear and, concise, and addressed the overarching research question in this case study. In this study, I transcribed interview data from the recorded interviews. Documents and records included invitations to participate, letters of acknowledgements, interview appointments, and documents requesting usage of the interview facilities, sign in sheets, consent letters and all raw data that I collected upon IRB approval.

Another method used in this study was member checking (Creswell, 1998). Member checking contributed to the credibility of my findings by minimizing investigative bias (Stake, 1995). Responses were recorded and presented to the participants for their review and feedback (Creswell, 1998). This process ensured that the responses recorded were the participants' true feelings, expressions, thoughts, and ideas (Creswell, 1998). The use of digital recording ensured all the information was recorded for transcription. The Atlas ti-6 program was used in coding of the interviews. These aforementioned processes helped to improve the reliability of the study. After member checking was completed, the participants reviewed my notes for verification purposes. This process was completed before data analysis began.

Summary

In Section 3, the rationale for selecting the case study was addressed. In the introduction, I provided an overview of the proposed study, which includes the purpose

of CATE and its history. I also discussed the current status of CATE courses at the Echo Career and Technology Center. I discussed the data collection and analysis procedures. In section 4, I presented the finding of the study.

Section 4: Findings

Introduction

The purpose of this chapter is to present the findings. I sought to provide school and district office administrators with findings that may help with the improvement of CATE programs. I collected data by interviewing 10 CATE students following the interview protocol (Appendices A and B). I reviewed the interview data that I transcribed and color coded the interview data. Data will be maintained for a period of 5 years; after that time, data will be destroyed. The findings will be made available to central office administrative personnel and school board members in the School District to review upon request.

Data Generation, Collection, and Recording

CATE students have access to resources offered by Skills USA, which is an organization serving more than 300,000 students and instructors annually in state and territorial associations and ensures a skilled workforce by helping students develop skills. All high school graduates at the research site have taken CATE courses and have been at least 18 years old when they participated in this study. Ten students agreed to participate in this study by signing a consent form.

The interviewing process started upon approval from Walden's IRB # 07-05-11-74809 and the study site administrator responsible for research. Data were collected between July 5, 2011 and July 11, 2011 and were audio recorded during each interview with each participant who was asked the interview questions (Appendix A) about their perceptions of CATE courses. I transcribed each participant's audio taped responses and

via member checking I verified my understanding of their statements. Open coding of the interview data was utilized to identify and categorize emergent themes. Data were collected concurrently with follow-up audio replays for accuracy and were saved on my laptop and on an external driver without the participants' identifying information. Collected data will be kept in a secure, off site location to which, only I have access. The transcribed interview data were color coded for analysis by using Atlas Ti-6 software. All data will be available upon request to administrators at the research site.

Participants' Perceptions of CATE Courses

The participants reported positive perceptions of CATE in regards to instructional satisfaction, preparation for college and career goals, satisfaction, and training in basic, social, job and communications skills (see Table 1). The first interview question asked: "Please describe your learning experience when you attended Echo Career Center?" All participants indicated that they have learned technical skills and spoke about the teaching methods used by instructors such as audible and visual by utilizing some of the multiple intelligences (Gardner, 1999). CSP6 stated, "I learned things I could not learn at a regular high school. I'm about to go to college and make money, I love money, I can see a profit in this learning experience, it's like a business." CSP7 described his learning experience as a good experience. CSP6 participant stated," "I learned things that most people don't learn that would help me with college or whatever." CSP7 agreed with other participants by indicating hands on learning, and letting students get involved in training were great ways to assure student success. CSP4, CSP6, and CPS7 reported that relevance in education can make a difference in student success as they reported making money with

the skills learned in CATE classes. CSP8 said, “Hands-on made learning easier than using only books.”

Table 1

CATE: Learning Perceptions

Participant	CATE (+) Positive	CATE (-) Negative	CATE (+/-) Neutral
CSP1	1	0	0
CSP2	1	0	0
CSP3	1	0	0
CSP4	1	0	0
CSP5	1	0	0
CSP6	1	0	0
CSP7	1	0	0
CSP8	1	0	0
CSP9	1	0	0
CSP10	1	0	0
Totals	10	0	0

The participants agreed they learned a vast variety of technical skills (see Table 2). CSP9 explained the acquisition of automotive electrical skills used to install car stereos, amplifiers and other items. CPS3, CPS4, and CSP8 spoke about learning communications skills needed to talk to customers and other stakeholder. CSP1 and CSP7 indicated the acquisition of job skills which will assist student in how to dress,

prepare for interviews, interview etiquette, and various positive work ethics. CSP6 and CSP10 explained the use of problem solving skills used in troubleshooting operations. CSP1, CSP2, CSP3, CSP4, CSP5, and CSP9 indicated improved English and mathematics skills obtained in CATE courses paralleled those used at their home school. Technical skills acquired by students helped them to earn money almost immediately as stated by CSP4 and CSP6. Improved interpersonal and intrapersonal skills were picked up by CSP 2 and CSP9 who reported that CATE courses helped to overcome shyness and provided the tools to go ahead and perform the job. More importantly, to ask fellow technicians questions about problems they may have not encountered.

Table 2

CATE: Perceptions of Skills Acquisitions

Participant	CATE (+) Positive	CATE (-) Negative	CATE (+/-) Neutral
CSP1	1	0	0
CSP2	1	0	0
CSP3	1	0	0
CSP4	1	0	0
CSP5	1	0	0
CSP6	1	0	0
CSP7	1	0	0
CSP8	1	0	0
CSP9	1	0	0
CSP10	1	0	0
Totals	10	0	0

The participants' enrollment perceptions were listed in Table 3. The participants' overall perceptions of CATE were listed in Table 4. All participants reported positive perceptions of CATE. CPS1 and CSP3 indicated that CATE was very important and these two participants attended school every day and CATE helped them prepare for college. CSP4 explained how CATE can help student become entrepreneurs. CPS 5 indicated that CATE courses help a student learn skills they would not otherwise obtain

in regular high schools. CPS6 described CATE as a land of opportunity that gives high school students a chance to prepare for college ahead of time. CPS6 stated, “CATE is very motivational.” CSP7 indicated, “I feel that everyone should take these courses because it can help you further your career. It will give you a good head start on the career you want." CSP8 and CSP9 agreed with CSP7 in that CATE can help students wanting to learn a technical skill. CSP6 stated, “Students should take CATE courses if they choose.”

Table 3

CATE: Enrollment Perceptions

Participant	CATE (+) Positive	CATE (-) Negative	CATE (+/-) Neutral
CSP1	1	0	0
CSP2	1	0	0
CSP3	1	0	0
CSP4	1	0	0
CSP5	1	0	0
CSP6	1	0	0
CSP7	1	0	0
CSP8	1	0	0
CSP9	1	0	0
CSP10	1	0	0
Totals	10	0	0

The participants indicated instructional satisfaction in regards to rECC iving instruction to meet their individual educational needs to help them become successful in CATE courses (Table 4). Basic, communications, job, and customer service skills were acquired by students taking CATE courses as demonstrated by 100% of the students questioned during the interviews. The participants also stated that CATE also helped them prepare for college as the CATE curriculums provided hands on training which gave student real life experience with learning.

Table 4

CATE: Overall Perceptions

Participant	CATE (+) Positive	CATE (-) Negative	CATE (+/-) Neutral
CSP1	1	0	0
CSP2	1	0	0
CSP3	1	0	0
CSP4	1	0	0
CSP5	1	0	0
CSP6	1	0	0
CSP7	1	0	0
CSP8	1	0	0
CSP9	1	0	0
CSP10	1	0	0
Totals	10	0	0

All participants reported that they were satisfied with their overall learning experiences. CSP9 stated CATE will help students to further their learning to college and earn a degree. CSP1, CSP2, CSP3, CSP4, CSP7, and CSP8 explained taking CATE courses due to a recommendation from another student or family member. CSP6 reported taking a CATE course based on prior experience from a CATE mini course taken during a summer session and found the course to be cool. Some students also reported rECC iving a paid cooperative position or earning money using their newly acquired skills which provided additional experience with pay.

Themes

All participants reported they have had positive learning experiences with CATE and have developed technical skills such as computer maintenance, carpentry, and barbering skills. All participants also reported they have had hands on practical experiences and that their perceptions of the teachers' instructional methodologies were very positive. Specifically, the participants acquired technical, academic, job, communications, interpersonal, and intrapersonal skills. The participants' rationale for enrolling in CATE courses was based upon the recommendations from their friends, who have had previously taken CATE courses including some family members. The participants reported that school administrators should allow students to take CATE courses. Themes emerged that included positive CATE learning experiences, skills developed while taking CATE courses, rationale for enrolling in CATE courses, and overall perceptions of CATE.

Evidence of Quality

I consulted with professionals in the CATE field to evaluate the interview protocol and provide feedback, known as external auditing, which allowed me with the experts in this field to examine the process and product (Creswell, 2007). I also pilot tested the interview protocol with a panel of experts in CATE programs. The panel of experts assisted me in ensuring the questions were clear, concise, and addressed the overarching research question in this case study.

In this study, I transcribed the interview data from the audio recorded interviews. Documents and records included invitations to participate, documents requesting usage of the interview facilities, sign in sheets, consent letters and all raw data that I collected upon IRB approval. Responses were recorded and presented to the participants for their review and feedback, which ensured that the responses recorded were the participants' true feelings, expressions, thoughts, and ideas (Creswell, 1998). The Atlas ti-6 program was used in coding of the interviews data. Once member checking was completed, the participants reviewed my notes for verification purposes and this process was completed before data analysis.

Discrepant Cases

In this case study, there were no discrepant or nonconforming cases as indicated in the findings. I searched the data set for data that contradicted the potential findings by following Hatch's (2002) suggestions and found no discrepant cases (Merriam & Associates, 2002). The participants were consulted for clarification of their responses and no discrepant data emerged to contradict the overall findings (Hatch, 2002).

Practical Applications of the Findings

The findings were in line with the findings of researchers cited in Section 2 of this study, and also generated new knowledge that can be added to the body of literature on CATE pertaining to students' perceptions and benefits of CATE. Specifically, the findings reinforced many of the findings on students' learning experiences, skills acquired, overall perceptions, and rationale for taking CATE courses. According to literature cited in Section 2, CATE classes provide students with the opportunity to learn by using many of the multiple intelligences as described by Gardner (1999). Students may have used multiple intelligences to work on school activities (Muncy, 2006).

School districts should be encouraged to maintain the offering of CATE courses at the high school level. School districts and school building administrators should use the findings of this study when applying for funding for CATE education. CATE courses prepared high school students with education to career options (McNalley & Harvey, 2001). Jones (2006) asserted that jobs of the future would require personnel with high tech education. Murray (2007) reported that congress has allotted millions of dollars for advanced technology education designed to assist students in obtaining jobs in the future job market. CATE courses helped students reach their career goals (Gray, 2004) and were preparing high school students for the challenges of adulthood (McNalley & Harvey, 2001).

CATE courses assisted students in achieving success academically as noted by Silverberg et al. (2004) who indicated that students taking CATE courses made substantial academic progress in reading and mathematics. CATE education helped in the

development of academic and technical skills for at risk students, reducing dropout rates and dependence on social programs (Ainsworth & Roscigno, 2005; Maxwell & Rubin, 2000). CATE education can help improve the economy of a state or nation by providing needed skills to put more people to work.

The practical uses of the findings include the following: Parents and guidance counselors can work together to encourage students to enroll in CATE courses. School and district administrators can promote CATE by disseminating the results to other teachers, and school board members to request addition allocations of human and capital resources to promote CATE programs through advertisements on radio, television, and other media. Community leaders can lobby local, state, and federal legislators, and state departments of education for increased CATE funding for CATE courses to be used as alternatives to the development of basic academic and technical skills. Business and industry leaders can lobby for co-op programs and other initiatives for training and employing students. Teachers should encourage students to take CATE courses. Students should ask to enroll in CATE courses to help them become more successful in school. Finally, school principals should discourage counselors from talking students out of taking CATE courses due to their academic status.

Summary

In Section 4, I presented the findings. Themes emerged and included CATE learning experiences, skills acquired while taking CATE courses, rationale for enrolling in CATE courses and overall perceptions of CATE. All participants reported acquiring

technical skills for career goals. In Section 5, I will present interpretations of the findings and list suggestions and recommendations for further research.

Section 5: Discussion, Conclusions, and Recommendations

Discussion

The purpose of this study was to understand the participants' perceptions of the impact of CATE courses on career goals. A qualitative case study research design was employed. Data were collected by interviewing 10 participants. The findings of this study indicated that the CATE participants expressed positive perceptions of the impact of CATE courses on career goals.

Interview data were recorded, transcribed, and coded. The participants reported having positive perceptions of their learning experiences taking CATE courses and indicated that the instructors used various instructional methods, helped students develop technical and job-related skills relevant to their career or academic goals. The participants reported that they developed new or improved their academic and technical skills while taking CATE courses. Specifically, the participants reported improvement in their math, language arts, communications, job, interpersonal, and intrapersonal skills. The findings revealed CATE courses provided hands-on learning experiences for the participants. For example, one of the participants reported, "CATE is a land of opportunity." Another participant said, "CATE should be made available to any students with technical career goals." The participants reported being encouraged by relatives and friends to take CATE courses.

Interpretation of Findings

The participants reported having positive perceptions of their learning experiences by taking CATE courses. They also indicated that the instructors used various

instructional methods to teach participants skills relevant to career goals. Participants noted that CATE helped them with their career goals, college preparation, and they noticed improvement in skills such as math, language arts, communications, job skills, and interpersonal and intrapersonal skills. Finally, participants described CATE courses as interesting, hands-on, and "a land of opportunity." They reported rECC iving recommendation from friends or relatives to take CATE courses. The findings revealed that the participants reported having positive hands-on experiences by utilizing their senses of sight, touch, smell, and hearing. The findings also revealed that the participants improved their interpersonal and intrapersonal skills. One participant stated that his fears of communication were diminished. Another participant reported working in teams with colleagues to master technical skills. The participants utilized problem-solving skills to troubleshoot or construct a project. The instructors of the participants helped them to succeed in class by utilizing lectures, chalkboard instruction, drill and practice sessions, peer instruction, teacher guided demonstrations, individual and group projects, and problem solving activities (Tomlinson, 1999).

The findings should encourage district administrators and other stakeholders to lobby for increased support for CATE programs that help students connect academic and technical skills to real-life job-related activities (Plank et al., 2005) and to stay in school (Gray, 2004). The findings are in line with Muncy (2006) who reported that CATE students may have used multiple intelligences during CATE courses to prepare students for jobs and college (Carducci, 2006). The findings are also in line with the assertion that interpersonal skills were very effective in getting students to work in groups for project-

based learning (ClanLin, 2008) and technology integration activities (Page, 2006) to enhance both teaching and learning (Buckenmeyer, 2010) and promote student success (About & Looney, 2009).

The findings are also in line with those of Shearer and Luzzo (2009) who reported that multiple intelligences can promote career development, and with those of Ellis et al. (2008) that differentiated instruction is about the process of ensuring students learn (Levy, 2008; Williams, 2007). The findings are also in line with those of Kolodinsky et al. (2006) who described how a job fair was used to improve the self-efficacy of students to improve their interests in varying careers because the jobs of the future would require personnel with high tech education (Jones, 2006). Porfeli et al. (2008) asserted that CATE should be made available to all students. As a result, the findings are also in line with the assertions of Association for Career and Technical Education (2010) that CATE provides students with real world applications and employment skills because otherwise many students may not be able to make the connection between basic skills and real life education (Hood, 2005).

CATE courses can help sstudents enhance technological and academic skills. According to Weaver (2005) and Johnson and Londt (2010), CATE can be used to help students become interested in high tech learning. According to Caron (2010), Feng et al. (2010), and Ewers (2010), teachers should focus on integrating technology into the curricula. Haskell and Haskell (2010) asserted that students in CATE are helped to achieve their career goals by rECC iving technical and academic skills. CATE can help

school district decrease dropout rates by increasing student attendance and completion rates in accord with the No Child Left behind Legislation (Cassidy, 2007).

The participants of this study were males. According to Dakers et al. (2009), female students are underrepresented in CATE education. The findings can help female students take CATE courses by enhancing the curriculum for female students to participation in CATE courses (Miliszewska & Moore, 2010). The findings are in line with the assertions of Dalley-Trim et al. (2008) that CATE courses are interesting and students are provided with hands on training and with the assertions of Cassidy (2007) that CATE helped students stay in school. According to an article in Career and Technical Education (2010), CATE provides real world applications relevant to students. According to Jokic et al. (2009), Huang and Cho (2009), and Hunter (2009), school stakeholders can help students succeed through both lecture and demonstration (Stichter, 2009). In CATE courses, students have the autonomy to be creative about their learning and as a result students are motivated (Jankowska & Atlay, 2009) because CATE teachers focus on student success (Goe, 2007). The findings are in line with those of Martin and Dowson (2009) who explained that interpersonal relationships between students and teachers can be instrumental in helping improve student success. Ozden (2008) indicated that there is a relationship between teacher pedagogical content knowledge and student success. CATE courses have helped the participants achieve their career or post-secondary education goals. Via this research project, I have determined that CATE courses have helped students improve their learning.

Summary of Research Themes

All 10 participants reported having positive learning experiences taking CATE courses. The participants reported favorably of the instructors' instructional methods. Participants also reported acquiring numerous skills while taking CATE courses to include technical and academic skills. Participants reported positive overall perceptions of CATE and believed in preparing themselves for career goals or entering college. Hands on training were an important part of CATE, and as a result, students stayed in school. Each participant stated registering in CATE courses on the recommendation of friends or family members. All participants stated CATE courses are beneficial to students.

Comparison: Literature Review to the Research Findings

According to Plank et al. (2005), CATE helped students stay in school by connecting academic and technical skills to real-life job related activities, learning with occupationally related tools and equipment. Plank et al. (2005) also indicated that CATE provided students with motivation to stay in school and to have a variety of career choices. Research finding indicated that CATE did provide participants with real-life job-related training.

One of the main purposes of CATE was to prepare students for adulthood. Participants indicated by their responses to Interview Question #3 that CATE courses helped prepare them for college or the job market. Gray (2004) signified CATE improves student enrollment, and improve student attendance in school, this was evident by participant's responses in Interview Questions #2 and #3. Harvey (2001) and Stone

(2004) also stated that CATE helped prevent student dropout by providing hands on training. In addition, CATE provide training in basic, technical and job skills all of which could help students achieve their post secondary education and career goals as described by participant's responses in interview questions #2 and #3. Fields (2008) stated that high school students joining the workforce can help generate revenues to improve a nation's economy. Participants' responses indicated that they desired to go into the military, college, start a career or even start their own businesses.

Participants' responses to interview question #1 showed that students taking CATE courses showed marked academic progress in basic skills which lined up with Silverburg, Warner, Fong, and Goodwin (2004). Participants in the study also indicated positive perceptions of CATE due to effective instructional strategies utilized by their instructors. The overall comparison of the results of this research study and the literature review indicated that both display a high degree of correlation which confirms the positive perceptions of CATE by the participants and the benefits of CATE in the literature review.

Implications for Social Change

Based upon the findings of this study, CATE courses helped students achieve their career goals. Implications for social change include an awareness of the benefits of CATE courses for students, employers, and society. The findings indicated that CATE courses provided students with hands on practical applications where CATE instructors strived to meet the needs of CATE students indicating that CATE students have been prepared for career opportunities. The findings also indicated that CATE students

graduated from high school because students developed technical skills, academic skills, and motivation to stay in school.

Another implication for social change is that CATE provides students with an alternate form of education which could help them complete high school. This opportunity for completion in turn could help administrators and school district to meet the Annual Yearly Progress indicators as outlined by the No Child Left behind Act of 2002. School districts, schools, and teachers are evaluated based on student attendance, student success, and student completion rates. CATE courses helped students stay in school. Students would have the opportunity participate in a technical education at a 2-year college, which would be much cheaper than its 4-year counterpart. Completion of a 2-year college program could help students get job training, which may lead to "stable" employment. Local and state governments could benefit from less law enforcement intervention and possibly a decrease in the amount of money spent on the cost of incarceration.

As more students successfully complete CATE, federal and state funding could possibly decrease as more CATE students would be working contributing to revenues for local, state and federal governments. Businesses can hire CATE graduates for technical jobs. CATE students can continue their college education. Parents of CATE students can advocate for CATE as an alternative form of education. Teachers and school administrators can make better placement decisions of high school students who will benefit by enrolling in CATE to stay in school. Community and businesses should

continue to provide coop and job training opportunities for CATE graduates to compete in the global economy. Policymakers should continue to support and fund CATE.

Recommendations for Actions

The recommendations for action are as follows: I intend to circulate the findings to building and district level administrators to request school counselors to consider placing students in CATE courses when nECC ssary; Second, education stakeholders can lobby state and federal legislators to increase CATE funding through the Carl D. Perkins Act; Third, education stakeholders should continue to support local career and technology centers; and Forth, school district administrators should create articulation agreements with 4-year colleges to accept credits from technical colleges for the purpose of providing additional educational opportunities. School district and building level administrators should consider applying for credit approval for students taking CATE courses.

Recommendations for Further Studies

Other researcher in this area could replicate this study on a state and national level to determine more students' perceptions of CATE. Educators may wish to replicate this study using a quantitative research design to investigate CATE effectiveness on career goals. Researchers may wish to interview teachers of CATE regarding the benefits of CATE. Skills USA may conduct a mixed-methods study to shed further light on this topic.

Reflection

My experiences in conducting this research study were positive. This case study provided me with the opportunity to strengthen my research skills. I have been employed as a career and technology education teacher for 24 years. The findings motivated me to be willing to conduct further studies and continue my career as a CATE instructor. This case study has encouraged me to conduct other studies on a national level for educational entities such as Skills USA.

Conclusion

The purpose of this study was to understand the perceptions of the participants of the impact of CATE courses on career goals. A qualitative case study research design was employed. Data were collected by interviewing 10 participants. The findings of this study indicated that the CATE participants expressed positive perceptions of the impact of CATE courses on career goals. The participants reported having positive perceptions of CATE in reference to skills acquired, learning experiences, overall perception and rationale for taking CATE courses.

The participants reported favorably of the instructors' instructional methods. Participants reported positive overall perceptions of CATE and believed in preparing themselves for career goals or entering college. Based upon the findings of this study, CATE courses helped students achieve their career goals. Implications for social change include an awareness of the benefits of CATE courses for students, employers, and society. The findings indicated that CATE courses provided students with hands on practical applications where CATE instructors strived to meet the needs of CATE

students indicating that CATE students have been prepared for career opportunities. The findings also indicated that CATE students graduated from high school because students developed technical and academic skills. Another implication for social change is that CATE can provide students with an alternate form of education which would help them complete high school. This in turn would help administrators and school district to meet the Annual Yearly Progress indicators as outlined by the No Child Left behind Act of 2002. Based on this research study, CATE does assist students in achieving their career goals and helps school to improve attendance, graduation rates.

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Appendix A: Interview Questions

The following script will be used to start the interview process: “Good Morning, I am a doctoral student at Walden University. I am conducting a study to determine the perceptions of CATE by students of the Echo Career Center. I would like to inform you that you may discontinue your participation in this study at anytime. Participation in this study will in no way affect your current employment. Your identity will be kept confidential. There will be no compensation for participation in this study

Please respond to the following questions:

(1) Please tell about your learning experiences when you attended the Echo Career Center?

(2) What skills have you learned while taking CATE courses?

(3) What are your perceptions of CATE?

(4) What influenced your decision to take a CATE course in high school?

Curriculum Vitae

Darryl Terrence Middleton

Education

Expected 2011	Walden University, Minneapolis, MN Doctorate of Education (EdD) Concentration-Teacher Leadership
2001	The Citadel Masters of Education Concentration – Secondary School Administration
1999	Southern Illinois University Bachelor of Science Concentration – Workforce Education and Development
1990	Trident Technical College Associates of Science Concentration – Vocational Technical Education

Professional

July 2007-Current Experience — School District
Electronics Instructor/Skills USA Advisor

- Teach Cisco Computer Networking
- Teach Mobile Electronics
- Teach Skills USA Curriculum
- Mentor students

July 2001-July 2007 — School District
Assistant Principal

- Assist principal in everyday school operations
- Transportation supervisor
- Certified Teacher Evaluator

July 1997-July 2001 — School District

- Career and Technology Education Instructor
- School Bus Driver
- Middle School Basketball Coach
- Military Drill Instructor
- Student Mentor

July 1993-July 1997 School District

- Career and Technology Education Instructor
- School Bus Driver
- Middle School Basketball Coach
- Assistant Football Coach
- Assistant Baseball Coach

July 1989-July 1993 School District

- Career and Technology Education Instructor
- School Bus Driver
- Student Mentor

Certifications
High School Principal
Secondary Supervisor
District Office Supervisor
Career Center Director
Electronics
Cisco Networking SOHO
Cisco Networking Small to Medium Business
Cisco Networking Medium to Enterprise
Cisco Switching and Routing in the Enterprise Network
Cisco IT Essentials
Cisco Instructor Certification

Awards
Nominated Teacher of the Year, Career Center
Outstanding Instructor 2007, 2008, 2009, 2010
Nominated Skills USA Advisor of the Year