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ENROLLMENT OF STUDENTS WITH DISABLITIES IN CAREER AND TECHNICAL EDUCATION

An Abstract of a Thesis

Submitted

In Partial Fulfillment

Of the Requirements for the Degree

Specialist in Education

Cory C. Johnson

University of Northern Iowa

July 2011

ABSTRACT

The enrollment patterns of students with and without disabilities in Career and Technical Education (CTE) were examined. Data were collected from the transcripts and Individualized Education Plans (IEP) of 27 students with disabilities and the transcripts of 27 students without disabilities from three school districts at the end of their senior year. The data were analyzed using descriptive statistical analyses to describe differences between the enrollment patterns of students with and without disabilities as well as between students with different types and severity of disability. Overall, students in special education earned more CTE credits than students in general education. Additionally, subgroup analyses indicated that students with less severe disabilities earned more CTE credits than students with more severe disabilities and students with behavior goals earn more CTE credits than students who only have academic goals. In addition, findings regarding non-CTE credits and credit completion are described. Implications for practice are discussed.

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Cory C. Johnson

Entitled:

Enrollment of Students with Disabilities in Career and Technical Education

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CHAPTER 1

INTRODUCTION

"The ultimate goal of special education [is] successful transition from school to the community" (Benz & Halpern, 1993, p. 197). Despite this goal there continues to be a discrepancy between the post-school success of students with and without disabilities. Schools must provide a free and appropriate public education (FAPE) and develop transition plans and programs that "promote the movement from school to postschool settings" and "provide appropriate and genuine supports and services" for students with identified disabilities (Etscheidt, 2006, p. 32-33). Research has shown that one of the most effective ways to achieve the goal of successful transition is to incorporate career education with employment as part of the child's elementary, middle school, and secondary education programs (Repetto, 2003; Wehman, 1998).

Transition planning is an essential and legally mandated component of an appropriate education for students with disabilities with the purpose of maximizing their success once they leave the educational system. Career and Technical Education (CTE) is an essential component of effective transition planning leading to successful transition outcomes and employment for students with disabilities. Sitlington, Clark, and Kolstoe (2000) defined three categories of CTE skills that should be provided as part of a comprehensive special education program: general employability skills, occupational skills, and vocational skills. General employability skills refer to "general work skills such as following directions, on-task behavior, concern for quality of work, concern for work rate, recognizing and correcting errors or problems, attendance and punctuality, and

ability to take instruction and criticism" (p. 34). Occupational skills include the skills to find, obtain, and maintain employment, basic academic skills, and the ability to adapt to the work environment and demands. Vocational skills are career specific skills that prepare a student for employment in a specific area or field and can be divided into eight areas: agriculture, business, health, marketing, family and consumer sciences, trade and industry, technical skills, and technology and industrial arts (Gordon, 2008). Research supports the importance of providing the various types of general and special education CTE programming to students receiving special education.

The inclusion of Career and Technical Education programming in the curriculum for students with disabilities has been shown to lead to improved rates of graduation and more successful transition outcomes. While the types of programming needed vary based on a student's individual needs, students with disabilities should have access to a variety of CTE programming that fit their individual interests and needs and allows for inclusion in the general education curriculum and classroom. Appropriate goals and programs should be included in the student's Individualized Education Program (IEP) as determined appropriate by the IEP team.

CHAPTER 2

REVIEW OF THE LITERATURE

The Need for Career and Technical Education

There are five primary factors that promote the inclusion of effective CTE in the IEP of students with disabilities. First, federal law requires the inclusion of educational programming to promote successful transition to adult life and guarantees access for students with disabilities to CTE and other general education curricula. Second, despite the value of employment for all people, there is a large discrepancy between the unemployment rates of persons with and without disabilities. Third, there is research suggesting CTE can improve employment outcomes. Fourth, CTE programming has been shown to decrease dropout rates, which promotes successful transition. Fifth, all students need to develop skills that will help them transition into adult life; students with disabilities especially benefit from curricular programming that provides direct instruction and practice of these skills.

Legal Requirements

There are many pieces of federal legislation that pertain to CTE and special education transition services including legislation in the areas of special education, rehabilitation, civil rights, vocational-technical education, workforce training, and educational reform (Sitlington, et al., 2000). A few of the most influential pieces of legislation will be highlighted.

The Smith-Hughes Act of 1917 (PL 347), the earliest piece of relevant legislation, grew out of a need to provide students with the skills required to be prepared for life after

school in the changing employment landscape at the turn of the 20th century (Pulliam & Van Patten, 2007). The Act provided recognition of the importance of vocational training as a part of a student's educational program by providing federal funding for the development of vocational training programs in public secondary schools (Pulliam & Van Patten, 2007; Sitlington et al., 2000). The Vocational Education Act of 1963 (PL 88-210) expanded the definition of vocational education to include business and cooperative work-study programs, ensured access to CTE in all communities, and provided funding to be used to guarantee people with disabilities access to CTE (Brolin & Loyd, 2004; Gordon, 2008). The amendments to this Act (PL 90-576) in 1968 further extended funding for students with disabilities, requiring states to develop CTE programs designed to meet the unique needs of students with disabilities (Brolin & Loyd, 2004).

While this law provided funding for programs, specific protections for students with disabilities were not enacted until 1973 when the Rehabilitation Act (PL 93-112) was passed. The Rehabilitation Act, often referred to as the first civil rights law for persons with disabilities, resulted in the provision of many protections for people with disabilities. The protections included the guaranteed provision of accommodations and modifications to allow students with disabilities equal access to the general education curriculum, including CTE (Brolin & Loyd, 2004; Sitlington et al., 2000). The Education for All Handicapped Children Act of 1975 (PL 94-142), referred to as "the Bill of Rights for children with disabilities" (Brolin & Loyd, 2004, p.18), further solidified the mandates of the Rehabilitation Act of 1973 and guaranteed all students FAPE with access to special education services designed to meet the individual needs of students with

disabilities. This legislation assured students with disabilities access to an appropriate and adequate education (Brolin & Loyd, 2004). The Carl D. Perkins Vocational Education Act of 1984 helped improve educational services and opportunities for students with disabilities by providing federal funds to improve access to CTE (Gordon, 2008). These laws changed the way in which students with disabilities were educated and drastically improved their educational opportunities.

The early legislations' effectiveness in promoting CTE programming as a part of transition planning can be seen in a 1984 report in which Conway (as cited in Sitlington et al., 2000) "reported that the number of students with disabilities participating in vocational education programs increased 95% between 1976 and 1982" (p. 53). Despite these early improvements in enrollment, there continued to be a need for improved educational programming to support successful transition for students with special needs.

More recent pieces of legislation have continued to provide protections and guarantee adequate services for students with disabilities. Most notably, the Individuals with Disabilities Education Act of 1990 (IDEA; PL 101-476) reemphasized the mandate of providing FAPE with access to appropriate curriculum and special education services to meet the needs of individual children with disabilities. IDEA focused on transition outcomes (Etscheidt, 2006) which highlighted the importance of monitoring post-school activities and employment. In 2004, IDEA was reauthorized and the focus was changed to "the child's academic achievement and functional performance" and "assist[ing] the child in meeting the child's post-secondary goals" (20 U.S.C. S. 1414(c)(5)(B)(ii); Etscheidt, 2006). The 2004 reauthorization also re-emphasized the importance of

students' access to, and progress in the general education curriculum, as well as preparing students for successful transition (Guy, Sitlington, Larsen, & Frank, 2009; Kochhar-Bryant, Shaw, & Izzo, 2007). This shift should prompt educators to more closely analyze the curriculum that has been designed and implemented to promote desired academic progress and transition outcomes, including enrollment in general education CTE classes.

The law also provides guidelines for implementing an appropriate educational program. IDEA 1990 required the inclusion of transition planning in the Individualized Education Program by age 16 in order to guarantee access to a curriculum that is designed to meet the child's individual needs (Brolin & Loyd, 2004). In 2006, the federal definition of transition services was reauthorized as "a coordinated set of activities" that are "based on the individual child's needs, taking into account the child's strengths, preferences, and interests, and includes…the development of employment and other post-school adult living objectives" (34 C.F.R. S. 300.43(a)). This definition further emphasizes and codifies the necessity of including programming in a student's plan of study that will prepare the individual to successfully transition into adult employment. Career and Technical Education has been shown to improve the acquisition of employability skills as well as employment outcomes for students with disabilities.

Other legislation has had a direct impact on educational programming designed to develop occupational skills for students with disabilities. The Job Training Reform Amendments of 1992 (PL 102-367) promoted the placement of disadvantaged youth and youth with disabilities in job training and employment programs (Brolin & Loyd, 2004). Similarly, the School-to-Work Opportunities Act of 1994 (PL 103-239) promoted

partnerships between schools and employers, requiring that all students have the opportunity to participate in a school-to-work program to acquire knowledge, skills, abilities, and information to promote successful post-school transition (Brolin & Loyd, 2004; Gordon, 2008). This Act, in conjunction with the Goals 2000: Educate America Act of 1994 (PL 103-227), was implemented to improve the nation's education system and educational outcomes for all students (Brolin & Loyd, 2004). Additionally, the Carl D. Perkins Vocational and Applied Technology Education Act, passed in 1990, was designed to engage students in activities to prepare them for the workforce, integrate academic and vocational education, and create collaborative relationships between schools and employers (Eisenman, 2000; Gordon, 2008). Together, these legal mandates promoted the integration of academic and occupational education and guaranteed equal access to vocational and school-to-work activities for students with disabilities (Eisenman, 2000; Gordon, 2008). These laws, spanning over 90 years, recognize and promote the important role of CTE in the development of crucial skills that are beneficial for all students, especially those with disabilities.

While the legislation has provided guidelines for programming and increased access to services, unresolved concerns regarding access to CTE have resulted in Due Process hearings in which families and schools have taken legal action to resolve disputes. These cases have resulted in additional protections and have clarified inconsistencies and confusion in the law, lending further support for the importance of CTE. In one such ruling, the administrative law judge concluded that school districts are "required to provide job experiences that [are] based on [the student's] individual needs,

taking into account his preferences and interests" (Wisconsin Dells School District, 35 IDELR 145). In another case, it was established that simply graduating from high school is not an adequate measure of educational benefit and the appropriateness of an education. It was ruled that the school was "required…to identify and provide those services that would prepare the student to have a realistic chance at achieving their goal" (Caribou School Department, 35 IDELR 118). These decisions emphasized the importance of providing individualized transition oriented services for students with disabilities in order to assure the provision of FAPE and the fulfillment of appropriate transition related goals. Research supports the importance and effectiveness of CTE in obtaining these goals and promoting successful transition.

There have been many legal advances in the areas of CTE and special education transition programming. Over the past 100 years, the field of CTE has been developed and recognized as an integral part of a student's educational experience. In the past 35 years, the right to FAPE, including participation in CTE programming, has been extended to all students. Despite these legal advances and the codification of transition practices, the research shows progress is still needed to promote successful transition outcomes for all students.

Employment Outcomes

The benefits of employment for individuals with disabilities include opportunities to learn new skills, develop social and professional relationships, contribute to an organization, and gain financial stability, self-confidence, self-esteem, and independence (Bateman, 1996; Carter & Lunsford, 2005; Wehman, 1998). Furthermore, Repetto (2003)

contended that "employment and quality of life are intertwined" (p.79) because employment provides financial and emotional support which promotes independent living, recreational activities, the development of personal identity, and the formation of interpersonal relationships. For all individuals, including those with disabilities, work and the related rewards are an important part of a person's individual development, the development of a healthy individual and social identity, and promotes inclusion in the community.

Unemployment. Postsecondary employment data for people with disabilities are discouraging. Shortly after the passage of PL 94-142, the Education of All Handicapped Children Act of 1975, 78.6% of adults with disabilities were unemployed (Wehman, Kregel, & Seyfarth, 1985). The unemployment rate among this population was 55% during the first National Longitudinal Transition Study (NLTS) in 1987 and 46% during the second NLTS study in 2000 (Fabian, 2007). Another 2000 study by the National Organization on Disability found only 32% of all people with disabilities were employed either full- or part-time compared with 81% of people without disabilities. In 2010, 14.8% of persons with disabilities were unemployed as compared to 9.4% of persons without disabilities (United States Bureau of Labor Statistics, 2011a). While there are some inconsistencies in the data, the overall trend shows improvement since 1975. It is clear, however, that people with disabilities continue to be employed at a much lower rate that those without disabilities.

Underemployment. In addition to concerns regarding unemployment, data has shown that people with disabilities who are employed often lack adequate employment.

One study found competitive employment rates for individuals with disabilities three to five years after exit from school to be 57%, while 69% of individuals without disabilities were competitively employed (Blackorby & Wagner, 1996). Among adults with disabilities who are employed, 68% are employed part-time (Rabren, Dunn, & Chambers, 2002). Luftig and Muthert (2005) contended that up to 75% of people with disabilities are either unemployed or underemployed. Additionally, students with disabilities are two times less likely than non-disabled peers to be employed or engaged in post-secondary education (Benz, Yovanoff, & Doren, 1997). While there is some variance between studies and the data shows improvement in the employment outcomes for people with disabilities since the passage of PL 94-142, there is a large discrepancy in the employment rates of people with and without disabilities. These findings point to a need for transition planning and services beyond the provision of a traditional free and appropriate public education to provide individuals with disabilities with the skills needed for successful competitive employment.

Some studies show an additional discrepancy in employment rates between people with different types of disabilities. Luftig and Muthert (2005), for example, studied the transition outcomes of 36 adults with disabilities who graduated from an inclusionary high school that emphasized CTE. Almost 81% of the graduates were employed, a much higher percentage than national data would predict, indicating the effectiveness of the school's programming. There were still significant differences, however, between disability types. They found that 94% of students with learning

disabilities reported that they were employed while only 68% of students with developmental disabilities were employed.

CTE's Effectiveness in Improving Employment Outcomes

Many studies support the importance of CTE and work experience for students with disabilities while in high school. In one of the first studies of its kind after the passage of PL 94-142, Hasazi, Gordon, and Roe (1985) investigated the factors affecting employment outcomes for students with mild and moderate disabilities who graduated between 1979 and 1983. They found evidence suggesting that educational experiences, vocational experiences, mode of exit from high school (i.e. graduation, age-out, dropout, certificate of completion), vocational education, and work experience during secondary education influenced the successfulness of employment outcomes.

Similarly, Wagner (1991) found enrollment in vocational education during the last year of high school was significantly related to transition outcomes. After controlling for extraneous factors including demographic and disability characteristics, Wagner found that students with disabilities who were enrolled in CTE during their last year of high school were more likely to attend a post-secondary vocational training program and more likely to be competitively employed two years after exit from school. This study also found positive relationships between enrollment in CTE and overall school performance. These two findings emphasize the effectiveness of CTE in promoting school and post-school success.

Job cooperative programs, also known as school-to-work programs, are one of the CTE program options that lead to successful employment outcomes (Benz et al., 1997;

Steere, Wood, Pancsofar, & Rucker, 1993). Students who participated in work experience programs as part of their secondary program were 13.9 percentage points more likely to be competitively employed than students who did not receive CTE in their final year of high school (Wagner, 1991). Rabren and colleagues (2002) found that students employed at the time of exit from high school were 3.8 times more likely to be employed after transitioning to adult life and 87% were still employed one year later (Rabren et al., 2002). Another study showed benefits for students with severe disabilities. This study indicated these students were 1.8 times more likely than their peers to be employed after graduation if they held at least two paid jobs while in high school (Benz, Lindstrom, & Yovanoff, 2000). These studies show the important role that job cooperative and work experience has in promoting successful transition. Despite these statistics, only about half of all students with disabilities (Benz & Halpern, 1993) and 11% of students with Emotional and Behavioral Disorders (Carter & Wehby, 2003) participate in school-sponsored work experience programs. This should prompt educators and transition professionals to consider the role of work experience programs in their students' transition related curriculum.

In addition, Benz and colleagues (1997) identified four skills and characteristics that make all students two to three times more likely to be competitively employed one year after exit from school:

1. Having two or more work experiences during the last two years of high school.
2. Exiting school with high social skills.
3. Exiting school with high job search skills.

4. Having no continuing vocational instruction needs one year out of school (p. 158).

These findings suggest that CTE is a crucially important component of a transition-focused education. Students who are enrolled in CTE while in high school are more likely to successfully transition after graduating and obtain employment during and after high school. Educators should provide appropriate general employability, occupational, vocational, and cooperative employment programming for students with disabilities as part of their educational program.

CTE and High School Completion

High school dropout is unarguably linked with employment outcomes. In 2010, 14.9% of high school dropouts were unemployed compared 10.3% of high school graduates without a college education, 8.4% for individuals with some college, and 4.7% for individuals with at least a 4 year degree (United States Bureau of Labor Statistics, 2011b). According to the United States Department of Education, 26.2 % of students with disabilities drop out of high school (26.3 % in Iowa; Planty et al., 2008). Other researchers estimate 20 to 50 percent of students with disabilities drop out (Bateman, 1996; National Organization on Disability, 2000) as compared to approximately 10% of all students nationally (National Center for Educational Statistics, 2009). Additionally, research indicates that youth who drop out are 16.6 percentage points less likely to be employed two years after leaving school (Wagner, 1991). The disproportionate rate at which students in special education drop out of school is alarming and may provide some explanation for the discrepancy in employment outcomes.

Career and Technical Education can help promote educational persistence and reduce dropout rates in order to reduce these discrepancies. Corbett, Clark, and Bank (2002) concluded, "Greater amounts of participation in vocational education while in secondary school are associated with lower rates of dropping out" (p. 367). Wagner (1991), after controlling for other factors, also concluded that students who were enrolled in CTE courses had significantly lower rates of absence and a significantly lower chance of dropping out. In a study of the Oregon Youth Transition Program, a comprehensive program designed to prepare students with disabilities for meaningful employment, Benz and his colleagues (2000) found that students who participated in the program for at least one year were 1.9 times more likely than their peers to graduate from high school. They also found that students who had at least two paid jobs during high school were 2.29 times more likely to graduate, and students who met at least four of their transition goals were 2.17 times more likely to graduate. Comprehensive educational programs designed to meet the specific individual needs and goals of students with disabilities are crucial in promoting school completion and successful transition.

In a review of risk barriers to successful transition, Murray (2003) recommended "opportunities for employment during high school" (p. 22) to help students overcome personal, social, and institutional barriers; such barriers would typically increase the likelihood of the student dropping out of high school. Bateman (1996) contended that dropping out is often the result of poor academic performance, low levels of engagement and attendance, and the perception that school is unimportant. Enrollment in a CTE program with an engaging, practical curriculum would be an important educational

component for students at risk for dropping out, especially those with special education needs.

Development of Work Readiness Skills

Edgar (1988) identified a common philosophy in vocational education, "certain general work skills can be taught [and] people can acquire specific job or technical skills that will increase their employability" (p. 5). Several authors have identified specific competencies and characteristics needed for successful postsecondary transition. Effective instructional methods have also been identified. Carter and Lunsford (2005) discussed the need for direct instruction of vocational, social, academic, and self-determination skills in order to increase competence and foster successful transition. The curriculum that is implemented should integrate academic and occupational learning (Eisenman, 2000) and should include career exploration and counseling, integrated academic and occupational instruction, a variety of work experiences (Benz et al., 1997), and an introduction and orientation to careers, resumes, applications, interviewing, and job maintenance skills (Bateman, 1996). Increasing skills in these areas, which are traditionally within the CTE curriculum, can improve school performance and successful post-school outcomes.

The Secretary's Commission on Achieving Necessary Skills (SCANS), which was formed in 1990 by the United States Department of Labor, examined the changing needs of employers and the implications for education. SCANS identified five skill areas in which all students need to be competent in order to be prepared for the world of work:

1. Managing resources including time, money, materials, facilities, and personnel.

2. Interpersonal skills including teamwork, training, customer service, leadership, and conflict resolution.
3. Acquiring, using, and communicating information.
4. Understanding systems-level inter-relationships.
5. Working with a variety of technology, applying appropriate technology to tasks, and troubleshooting (Secretary's Commission on Achieving Necessary Skills, 1991).

Career and Technical Education with highly qualified teachers is likely the best place for students to receive instruction to promote career readiness. Teachers in these areas are certified to provide instruction in general employability, occupational, and vocational curricula to develop the skills that SCANS (1991) identified as necessary for successful transition outcomes.

While research suggests that students who acquired work readiness skills while in high school have more successful post-school transition outcomes, studies have also shown that many students with disabilities lack the vocational skills necessary to maintain productive employment. Students with disabilities exhibit fewer career readiness skills, less confidence in their general employability skills, and are more unsure about their employment related goals and expectations than their peers without disabilities. In a study of 194 special and general education students, Ochs and Roessler (2001) concluded that students with disabilities had significantly lower career decision making self-efficacy beliefs, career outcome expectations, intentions to engage in career exploration, and levels of vocational identity. The authors stress the need for accurate

career assessments during the instructional and transition planning process and intensified CTE programming.

Employers also indicate skill deficits in their young employees with disabilities. Carter and Wehby (2003) conducted a study of 47 adolescents with Emotional and Behavioral Disorders who were employed while attending high school to determine whether or not their perceptions of their job performance were the same as their employers'. Employers rated work performance significantly lower than students across skill domains, with 73% of the discrepancies occurring in work performance and general work behavior domains. The poorest performance ratings also occurred in these domains. Additionally, when asked about the importance of different skills, employers consistently rated the importance of each skill domain higher than the students, with work performance and general work domains rated as most important. While there is an obvious need for skills acquisition, these students, on average, had taken only one vocational class and 89.4% had not participated in school-sponsored job training programs. This study suggests a need for instruction in work readiness skills so that students with disabilities develop general employability and occupational skills.

Parents of students with disabilities also report deficits in their children's employability skills. A survey of parental attitudes completed by Benz and Halpern (1993) compared parents of students with disabilities and parents of students without disabilities showing a perceived need for increased levels of CTE instruction. When comparing the number of parents who reported that their children's skills were sufficient, there was a difference of at least 10% on all measures, with fewer parents of students

with disabilities reporting sufficiency. In addition, parents of students with disabilities consistently rated their children's skills lower than parents of students without disabilities. Parents perceive students with disabilities to be most deficient in job awareness and job search skills. Approximately half of the parents rated their student's skills in job awareness as usually sufficient and 29% rated them as hardly ever sufficient. Similar ratings occurred in the area of job search skills. The largest discrepancy in ratings were regarding relationships with employers, with 79% of parents of students with disabilities rating their child's skills as usually proficient in this area, while 94% of the general education population received the same rating. Eighty percent of parents of students with disabilities perceived their children's work habits as sufficient compared with 94% of other parents.

In the same study, Benz and Halpern (1993) also surveyed teachers about students' with disabilities achievement of specific vocational skills including job awareness, job search skills, work habits, and relationships with supervisors. Across all categories, approximately 50% of students were rated as performing vocational skills well with little assistance with the remainder of students needing assistance or unable to perform each of the specified skills. Some skills, however, had significantly lower levels of competence including creating resumes (28%) and accepting criticism (37%). The skills with the highest level of competence were identifying the benefits of work and work behaviors (67%). In general, the highest proficiency rates were in job awareness and work habits and the lowest were in job search and relating to supervisors. CTE focused in these areas is needed to provide students with these necessary skills.

Factors Affecting Transition Outcomes

In addition to CTE, a number of factors have been found to influence employment outcomes. These include race (e.g. Fabian, 2007), gender (e.g. Benz & Halpern, 1993; Benz et al., 1997; Fabian, 2007; Heal & Rusch, 1995; Lindstrom, Benz, & Doren, 2004; Rabren et al., 2002; Sitlington, Frank, & Carson, 1992), socio-economic status (e.g. Fabian, 2007), type of disability (e.g. Benz & Halpern, 1993; Benz et al., 1997; Lindstrom et al., 2004; Sitlington et al., 1992; Rabren et al., 2002), academic achievement (e.g. Benz et al., 1997; Heal & Rusch, 1995), ethnicity (e.g. Blackorby & Wagner, 1995; Heal & Rusch, 1995), and urban or rural setting (e.g. Rabren et al., 2002). In general, research suggests that employment outcomes are most favorable for white, upper-middle-class individuals who have learning disabilities as opposed to some other type of disability.

Gender

Gender differences in outcomes have been identified in several studies. Using a national sample, Wagner (1991) found evidence that males are 12.8 percentage points more likely than females to be competitively employed two years after high school. Similarly, Blackorby and Wagner (1996) reported the rate of competitive employment two years after exit to be 52% for males and 31.5% for females. More recently, in a small regional sample, Rabren et al. (2002) concluded that males who had exited high school within the past five years were 2.3 times more likely to be employed than females. In a review of the literature, Doren and Benz (2001) identified six reasons for this discrepancy including lower enrollment in CTE, marriage and parenting responsibilities, family

income, underutilization of social and professional networks, lower self-esteem and career aspirations, and differences in services obtained from vocational rehabilitation services. Despite these findings, current figures from the United States Bureau of Labor Statistics (2011a) show that 15% of women with disabilities are unemployed compared to 16.4% of men.

Type of Disability

Employment rates have also been shown to differ by disability type. Rabren et al. (2002) concluded students with Learning Disabilities were 2.1 times more likely to be employed than those with other disabilities. Blackorby and Wagner (1996) also reported disability type to be a primary factor influencing the rates of competitive employment with 16.7% of people with multiple disabilities, 37% of individuals with a mental disability, and 70.8% of adults with learning disabilities holding competitive jobs three to five years after leaving school. While these differences are likely due to differing levels of functional, cognitive, social, and behavioral abilities and performance, more information is needed to fully understand the discrepancies

Size of Community

Studies investigating the influence of urban and rural settings have had conflicting conclusions. Wagner (1991) found a difference of 10.1 percentage points in favor of rural settings, while Rabren et al. (2002) found a difference of 23.1 percentage points in favor of an urban setting. These results may reflect a difference in the availability of resources within a specific community or region. More research in this area is warranted.

Race

Race has been shown to be another factor that influences employment outcomes. For example, Blackorby and Wagner (1996) found that the employment rate for students who had been served in special education differed by race. Among Whites, 60.8% were competitively employed three to five years after leaving school as compared to 50.5% of Hispanic and 47.3% of African Americans. Heal and Rusch (1995) included ethnicity in their discussion of individual characteristics and competencies that they predicted to influence post-school employment along with gender, living skills, and academic skills. This disparity may reflect broader social forces including discrimination and racism, as well as differences in opportunities as a result of socio-economic status.

Academic Skills

Benz and colleagues (1997) also included academic skills as an important factor in predicting post-school success, finding that students in special education programs who have high levels of academic achievement are two to three times more likely to be employed than students with lower academic skill levels. While attainment of academic skills is likely affect employment outcomes, these results may also reflect a difference in motivation and ability.

Rabren and colleagues (2002) formulated a model to predict post-school employment. They found that setting, gender, disability type, and employment status at the time of exit from high school were the variables that most affected transition outcomes. Using these factors, they developed a model that could correctly predict employment status 76% of the time. While many of the factors that have been shown to

affect post-school outcomes are outside of the school's influence, encouraging enrollment in effective educational programming and curriculum to provide students with career readiness, academic, and life skills is not only within the school's realm of influence, but also part of their ethical and legal obligation to their students. The CTE classroom and related experiences are places in which children can develop these skills.

Career and Technical Education to Promote Successful Transition

Programming for Successful Transition

Providing work-related skills to promote a successful transition to adult life is an appropriate and important part of public education (House of Representatives Report 101-544, 1990). Successful transition programs should include a focus on employment and vocational preparation with at least part of the instruction provided in the general education CTE classroom (Bateman, 1996; Levinson, 2008). In addition, CTE programs have the "benefit of a hands-on, applied learning environment focused in a skill-oriented curriculum" (Harvey, 2001, p. 112). Furthermore, Guy and colleagues (2009) determined that 73.2% of employment preparation courses were housed within general education CTE programs. The inclusive nature of this sort of programming helps maintain placement in the least restrictive environment (LRE) as mandated by federal and state law and promotes the development of authentic workplace skills in a setting that promotes active engagement in a practical curriculum.

Despite the findings that promote enrollment in CTE courses, many students with disabilities are not receiving CTE programming while in high school (Wagner, 1991); only one-third of individuals with disabilities who need job training receive it (National

Council on Disability, 2003 as cited in Kochhar-Bryant, et al., 2007). In a 3-year study of a regional sample, Benz and Halpern (1993) found a discrepancy between the students who need vocational instruction and the students who receive it. They found that 72% of students needed some type of vocational instruction during their last year of high school. It was determined that 90% of the students received the instruction needed if the needs were minimal; however, if the needs were more substantial, requiring a greater amount of CTE programming, only 30% received the necessary education. Approximately two-thirds of students with mental disabilities received both instruction and work-experience programming and 25% of students with learning disabilities received neither during their last year of high school. The authors concluded that students who most needed the programming were the least likely to receive it.

In addition, students with disabilities are not enrolling in CTE courses and, therefore, are not receiving adequate instruction to improve their employability skills. Carter and Wehby (2003) reported that, on average, high school students with Emotional and Behavioral Disorders had taken 1.1 vocational courses with 27.7% having not taken any. More CTE instruction is necessary to improve career readiness for students with disabilities, which will promote school completion and successful transition and employment outcomes. While the acquisition of these skills is considered necessary for all students, educators must pay special attention to these factors when teaching students with disabilities. Legal mandates requiring the inclusion of transition planning in the IEP (PL 101-476), along with the previously described employment and work-readiness gap, make enrollment in CTE especially important for students with disabilities.

Recommendations for Effective CTE Programming

Studies have suggested that for CTE programming to be successful, it must be individualized to meet each student's needs. Sitlington and colleagues (1992) completed a study of 938 adults who had been identified with a learning disability (LD), mental disability (MD), or behavior disorder (BD) and had graduated from high school in the State of Iowa. Mixed results were found regarding the influence of CTE on the outcomes of students with different types of disabilities. The study found that the amount of vocational training was not a significant factor when predicting employment outcomes of students with LD, but did predict outcomes for students with BD and MD. A student's employment status during high school was, however, found to be a predictive factor for students with LD and MD, but not BD. No outcome differences were found with regards to specially designed vocational training or work experience. Similar findings are described by Corbett and colleagues (2002) who found that occupationally specific vocational education had an insignificant relationship with career outcomes while other types of vocational training, including generic vocational education and on-the-job training, appeared to have a positive impact for students with BD in Florida. Collectively, these studies suggest a large amount of variability in the vocational needs of students with different types of disabilities as well as variability in the effectiveness of different types of CTE in meeting the various needs. While most, if not all, students would benefit from CTE, they may not need the same curricular components.

In an early article reviewing best practices in transition planning, Cobb and Hasazi (1987) included integration in secondary vocational education as a key component

of effective transition planning. The authors not only advocated for inclusion in regular vocational education programs, but also for cooperative education (school to work) programming and co-taught classrooms with vocational and special education teachers. Additionally, they argued for the inclusion of paid work experience and a job-seeking skills curriculum, saying that the final goal of transition is "employment in integrated work sites" (p. 16). In a similar review of best practices, Edgar (1988) promoted the strengthening of vocational education programs for students with disabilities. A school-to-work program should include career exploration, integrated academic and occupational instruction, and a variety of structured work experience placements that teach broad, transferable skills (Sitlington et al., 2000). The development of an effective school-to-work program is a collaborative process requiring dedication from, and cooperation between families, teachers, and local employers (Brolin & Loyd, 2004).

While variability exists based on the needs of individual students and communities, the research shows that CTE is an effective, appropriate, and necessary part of a transition-focused curriculum. Harvey (2001), Benz and colleagues (2000), and the National Secondary Transition Technical Assistance Center (2009) have suggested a number of factors that can help create a secondary education experience that engages students and provides a program that meets the individual learning needs and interests of each student promotes successful transition:

1. Providing career awareness training that includes a focus on career opportunities and transition goals that are interesting and realistic for the student.

2. Enrollment in appropriate CTE courses and programs including coursework, vocational education, work study, and paid work experience programs.
3. Active participation from students and parents in the transition planning process.
4. Development of a realistic transition plan with attainable outcome-oriented goals, in which CTE programming is considered an appropriate intervention and placement.
5. Creating goals that foster competence in functional academic, community living, personal-social, vocational, and self-determination skills.
6. Including CTE teachers on the transition team.
7. Promoting collaborative relationships between Special education and CTE teachers to support the educational and transition needs of individual students.
8. Providing authentic community experiences.
9. Integrating students into the general education environment.

Implementation of these recommendations may help develop educational programs that lead to higher attendance rates, higher rates of graduation, improved academic success, and more successful transition outcomes.

CHAPTER 3

METHOD

Evidence suggests that enrollment in CTE courses promotes successful transition from school to post-school living for students with disabilities. This study seeks to measure the number of CTE credits earned by students with disabilities as compared to students without disabilities to determine whether or not a discrepancy exists in CTE programming between the two samples. The data also allows for comparison between more specific subsets of the sample of individuals with disabilities.

Participants

The sample consisted of 27 students with disabilities and 27 students without disabilities from three school districts. All students were in the final semester of their senior year in high school. All of the students with disabilities were categorized primarily as Entitled Individuals. Most of the students with disabilities, 70.4%, had a weighted enrollment factor (WEF) of '1'; 11.1% had a WEF of '2' and 18.5% had a WEF of '3'. Due to the small sample size, the latter two groups were aggregated. Sixty-three percent of the students with disabilities had only academic goals, 18.5% had only behavior goals, and 18.5% had both academic and behavior goals. Twenty-two students had academic goals, of these 81.8% had goals in reading, 36.4% had goals in writing, and 18.2% had goals in math; some students had multiple goals. These descriptors are described in greater detail in the following section. No additional demographic data was collected to allow for further description of the general education comparison group.

Each individual was assigned a number in the coding process and a master list matching each individual with their identification number was held by a confederate in the local education agency (LEA). At the request of LEA administrators, parents were contacted by the LEA to allow them the opportunity to exclude their student's records from the study, providing passive consent for inclusion.

Procedures

Individualized Education Plans and transcripts for each student were reviewed and coded using the described coding process. Both documents are existing school records; no additional data was collected as part of this study. The existing data sets were analyzed and coded, without personal identifiers. The reviewer recorded the weighted enrollment factor, disability category, type of goal(s), and percent of time removed from general education as indicated in the most recent IEP. Using the student's transcript, the reviewer coded the number of credits attempted and earned in each of the curricular areas.

The student's weighted enrollment factor (WEF) is found on page 'A' of the IEP. This factor is used to measure the level of service being provided to the student and is used by the State Department of Education to determine the amount of funding to be provided for the individual student. The WEF is determined by considering the number of goals, need for curriculum modifications, need for specially designed instruction, intensity of support required, and the use of assistive technology, instructional associates, and specialized transportation. Students are weighted as Level 1, 2, or 3. Students with a WEF of 1 require the lowest intensity of services and students with a WEF of 3 require

the greatest intensity (Iowa Area Education Agencies, 2009). Disability category can also be found on the 'A' page of the IEP (Iowa Area Education Agencies, 2009) and are shown in Table 1.

Goals are found on page 'D' of the IEP. Each goal is numbered and aligned with state and district standards and benchmarks. The student's present level of performance in the goal area is summarized along with the inclusion of numerical baseline data. A measurable annual goal is stated and, for individuals age 14 and older, the IEP indicates whether the goal is related to the post-secondary expectation of living, learning, or working (Iowa Area Education Agencies, 2009). The reviewer coded the goal(s) and post-secondary expectation area as shown in Table 2.

The percent of time removed from general education is calculated on page 'F' of the IEP. This number represents the amount of time that the student receives services outside of the general education environment in settings that are only available to individuals with disabilities. It does not include placements in community or work experience programs or other community-based placements unless the services are provided in a community program which serves only individuals with disabilities. It is electronically calculated by dividing the number of minutes spent in special education by the total number of minutes in school (Iowa Area Education Agencies, 2009).

When analyzing transcripts, the Secondary School Course Classification System: School Codes for the Exchange of Data (SCED Codes; National Center for Educational Statistics, 2007) was used to determine the content and subject alignment of each course (i.e. math, science, business & marketing). The SCED Code system has been adopted by

Table 1

Iowa Disability Category Codes

Disability Category	Code
Autism Spectrum	AT
Behaviorally Disordered	BD
Communication Disability	CM
Deaf-Blindness	DB
Deafness	DF
Eligible Individual	EI
Hearing Impaired	HI
Head Injury	HJ
Learning Disability	LD
Mental Disability	MD
Other Health Impairment	OH
Orthopedic Impairment	OI
Physical Disability	PD
Speech Language	SL
Severely Disabled	SP
Visual Impairment/Blindness	VI

(Iowa Area Education Agencies, 2009, p. 64)

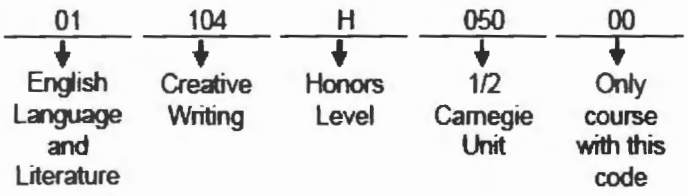
Table 2

Goal Codes

Type of Goal	Code
Math	Math
Reading Fluency	Rdg
Reading Comprehension	Comp
Writing	Writ
Speaking	Spk
Motor	Motor Skills
Behavior	Beh
Communication	Com
Study Skills	SS
Speech Language	SL
Daily Living	DL
Social	Soc
Living	L
Learning	Le
Working	W

the State of Iowa Department of Education and all secondary schools are required to assign a state code to each course (Iowa Department of Education, 2009). The codes

contain data identifying the subject area, course title, course level, Carnegie Unit, and sequence as shown in Figure 1.



(National Center for Education Statistics, 2007, p. 3)

Figure 1. SCED Coding System Example

For this study, the first two digits of the code were used to identify the subject area alignment. The researcher recorded all credits that appear on the transcript including both CTE and non-CTE courses. Table 3 shows the two-digit code for each of the content areas with CTE course areas in italics. An additional subject area code was added by the researcher and is shown in Table 3, Miscellaneous CTE. Miscellaneous CTE includes courses that were coded as "miscellaneous" using the subject area designation portion of the SCED Code but are considered to be CTE courses using traditional definitions of CTE (i.e. Gordon, 2008) including work experience and family and consumer science coursework.

The Carnegie Unit, which measures the amount of 'seat time' in the course (National Center for Educational Statistics, 2009, p. 3), was used to determine the number of credits earned in each subject area. For example, a person with three courses in business and marketing (SCED Code 12), each with a Carnegie Unit of .5 (SCED

Code 050), was assigned 1.5 business and marketing credits on the data collection form. Using this same process, the researcher separately recorded the number of credits attempted but failed or otherwise not completed.

Table 3

SCED Subject Area Codes

Subject Area	Code	Subject Area	Code
English Language Arts	01	*Manufacturing*	*13*
Mathematics	02	*Health Care Sciences*	*14*
Life and Physical Science	03	*Public, Protective, and Government Service*	*15*
Social Sciences and History	04	*Hospitality and Tourism*	*16*
Fine and Performing Arts	05	*Architecture and Construction*	*17*
Foreign Language and Literature	06	*Agriculture, Food, and Natural Resources*	*18*
Religious Education and Theology	07	*Human Services*	*19*
Physical, Health, and Safety Education	*08*	*Transportation, Distribution, and Logistics*	*20*
Military Science	*09*	*Engineering and Technology*	*21*
Computer and Information Sciences	*10*	Miscellaneous	22
Communication and Audio/Visual Technology	*11*	*Miscellaneous CTE*	*22**
Business and Marketing	*12*		

Italics added; National Center for Educational Statistics, 2009, p. 11)

Analysis

The data were analyzed using descriptive statistics to measure the differences in credits earned in each subject area between students with and without disabilities. Box and whisker plots were used to examine the distribution of data. Differences between students with different types or severities of disabilities were also analyzed based on goal areas and WEF. In order to protect individual identity, the data for the three LEAs is reported in aggregate form. Cells containing fewer than five were collapsed and combined with similarly defined cells.

CHAPTER 4

RESULTS

CTE Credits Earned by Students With and Without Disabilities

Descriptive analyses of the data show some positive trends in the sample. In these three districts, students who are entitled to special education services (n=27) completed, on average, 8.8 credits of CTE coursework during their high school education as compared to 7.3 credits for general education students (n=27). Figure 2 shows the distribution of Total CTE credits earned for entitled students (EI) and general education students (GE). Means and medians are similar for both groups (EI median=9; GE median=7.75) with minimum, maximum, and quartile values consistently higher for EI compared to GE. There is also a larger discrepancy between the 1st and 3rd quartiles for GE (4.75 credits) than for EI (3.5 credits) indicating a larger variance of earned CTE credits among general education students.

The number of CTE credits earned represents 32% of the total credits earned for students with disabilities (average total credits=27.29 credits) and 26% for general education students (average total credits=27.99). Figure 3 illustrates the distribution of total credits earned for EI and GE. Overall, the distributions are similar with similar means and medians for both groups (EI median=26.5; GE median=27.5). There was, however, a greater difference between the median and 1st quartile for EI than GE indicating greater variance in credits earned for EI, especially with regards to the variance of scores below the median. The difference between the first and third quartiles was 4.5

credits for EI and 3.5 credits for GE indicating a larger overall variance of total credits earned among students with disabilities despite greater extremes for GE.

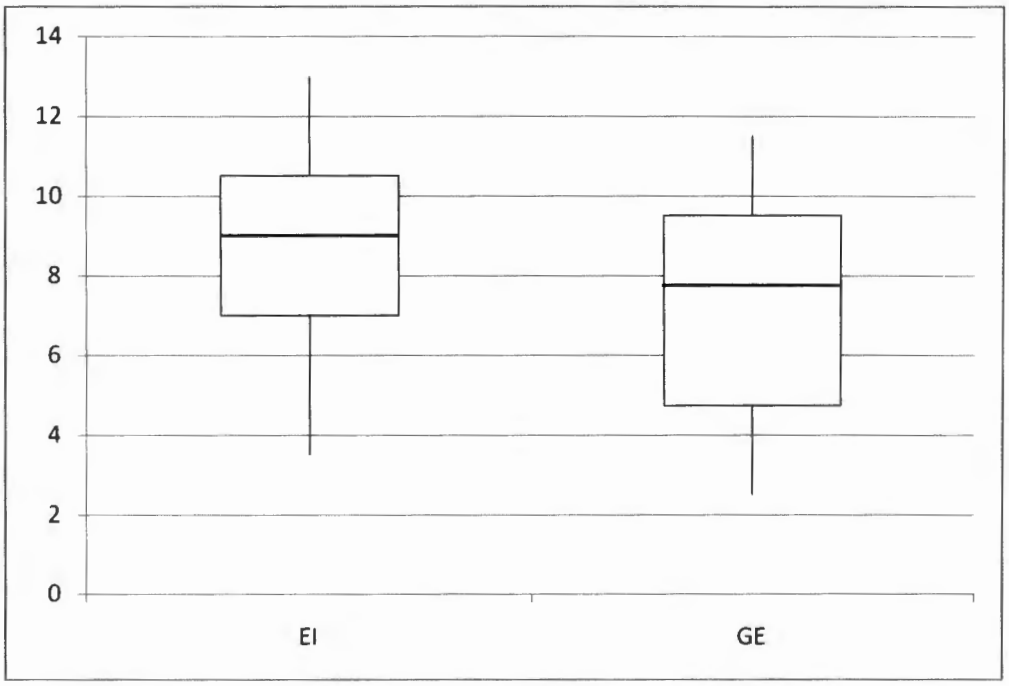


Figure 2. Distribution of Total CTE Credits Earned by Entitled and General Education Students

Table 4 shows the mean and median number of credits earned in each CTE category for EI and GE. Students who are entitled to special education services completed more courses, on average, in the areas of communications and audio/visual technology; manufacturing; architecture and construction; agriculture, food, and natural resources; human services; transportation, distribution, and logistics; and miscellaneous programs including family and consumer science and work experience than their peers in general education. General education students were more likely to complete coursework

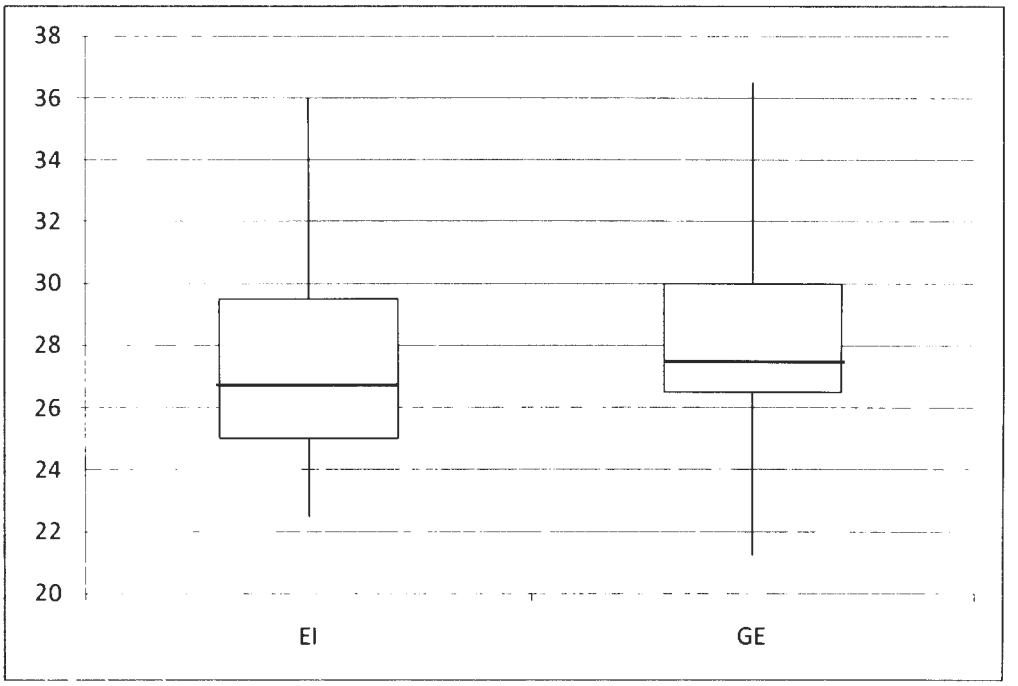


Figure 3. Distribution of Total Credits Earned by Entitled and General Education Students

in physical, health, and safety education; computer and information sciences; business and marketing; and engineering and technology. When medians are compared, no differences appear between the two groups except in the area of Miscellaneous CTE where students with disabilities earned more credits than their general education peers.

Table 4, along with the other tables in this chapter, also indicate floor effects and positive skew in the data. There are numerous instances of means of zero with small medians as well as standard deviations which are greater than the mean. This is due largely to the small sample size and the small number of credits earned in certain subject areas. For these reasons, medians are primarily used to analyze the data in this study.

Table 4

Mean Credits Earned in CTE Content Areas by Entitled and General Education Students

Content Area[a]	EI			GE		
	Mean	Med	SD	Mean	Med	SD
08 Health	2.95	3.00	0.48	3.05	3.00	0.47
10 Computer	0.13	0.00	0.22	0.30	0.00	0.44
11 Audio/Visual	0.14	0.00	0.22	0.09	0.00	0.20
12 Business/Marketing	1.11	1.00	1.17	1.46	1.00	1.57
13 Manufacturing	0.89	0.00	1.27	0.72	0.00	1.05
17 Architecture/Construction	0.54	0.00	0.91	0.30	0.00	0.54
18 Agriculture	0.69	0.00	1.22	0.44	0.00	0.95
19 Human Services	0.02	0.00	0.10	0.00	0.00	0.00
20 Transportation	0.17	0.00	0.44	0.06	0.00	0.21
21 Engineering	0.13	0.00	0.26	0.48	0.00	0.81
22[b] Miscellaneous CTE	2.02	1.50	1.84	0.37	0.00	0.53

[a]Content area designations are based on the SCED Code system (National Center for Educational Statistics, 2007). CTE areas that had an average enrollment of '0' for both entitled and general education students were not included in this chart. [b]Miscellaneous CTE includes courses that were coded as "miscellaneous" using the subject area designation portion of the SCED Code but are considered to be CTE courses using traditional definitions of CTE (i.e. Gordon, 2008) including work experience and family and consumer science coursework.

Tables displaying means and standard deviations are, however, shared in order to provide a comprehensive picture of the results and for use in analyzing portions of the study where they are meaningful, primarily those areas with higher numbers of credits earned.

CTE Credits Earned by Weighted Enrollment Factor

This study also sought to describe differences in CTE completion amongst special education populations based on type and severity of disability. The results indicate that students in these districts who had more severe disabilities completed fewer CTE credits. Students who had weighted enrollment factors of '2' or '3', indicating higher levels of education need, completed an average of 8 CTE credits compared to 9.1 credits for individuals with a weighted enrollment factor of '1'. Means also indicated a discrepancy in total CTE credits between the two groups with a median of 9.5 credits for individuals with less severe needs and 7.5 credits for students with more severe needs. Figure 4 shows the distribution of total CTE credits earned by students with weighted enrollment factors of '1' (WEF 1; n=19) and weighted enrollment factors of '2' and '3' (WEF 2, 3; n=8). Students with more severe needs had less variance in the total number of CTE credits completed while students with less severe disabilities were more likely to complete more CTE credits despite a greater variance and lower extreme.

Table 5 shows the mean and median number of credits earned in each of the CTE content areas for each of the WEF categories. Comparing means, students with more severe needs completed more credits in the areas of business and marketing, and miscellaneous programs while students whose disabilities are less severe earned more credits in all other CTE areas. Comparing medians, differences were only found in the

areas of business and marketing, and miscellaneous CTE in which students with more severe needs earned more credits and in the area of manufacturing where students with less severe needs earned more credits.

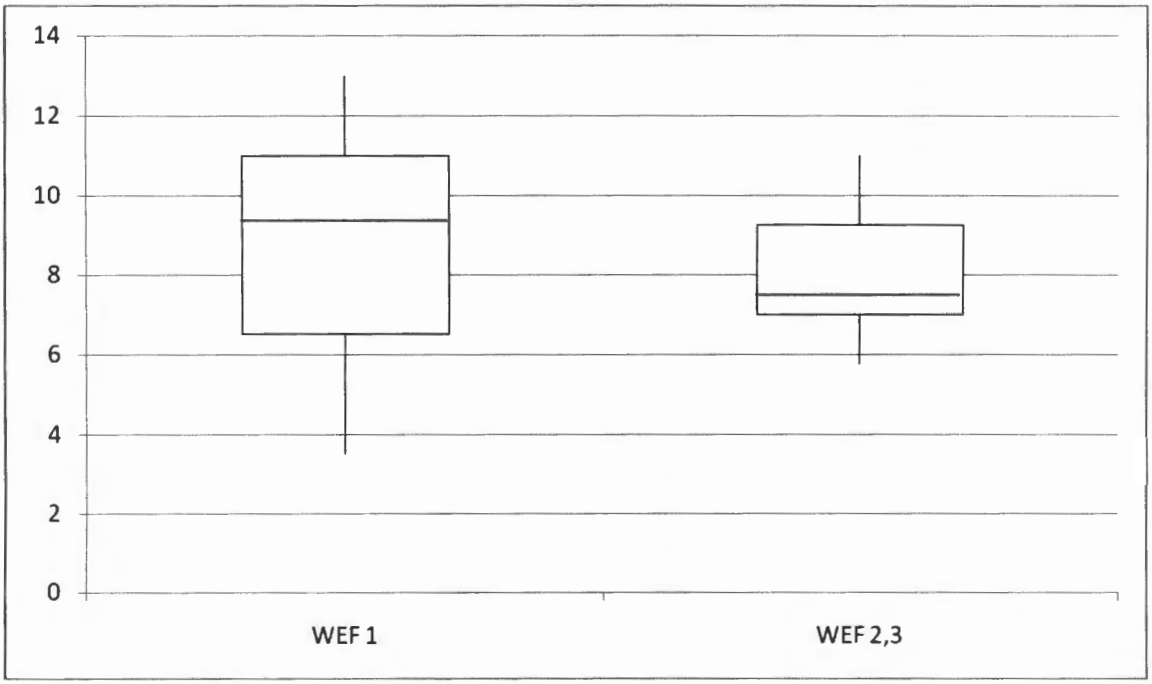


Figure 4. Distribution of Total CTE Credits Earned by Entitled Students Based on Weighted Enrollment Factor

CTE Credits Earned by Goal Type

Differences were also found between students with different types of IEP goals. Subgroups were divided into students with only academic goals (n=17), students with only behavior goals (n=5), and students with both academic and behavior goals (n=5).

Table 5

Mean Credits Earned in CTE Content Areas by Entitled Students Based on Weighted Enrollment Factor

Content Area[a]	WEF 1			WEF 2, 3		
	Mean	Med	SD	Mean	Med	SD
08 Health	2.97	3.00	0.46	2.91	3.00	0.57
10 Computer	0.16	0.00	0.24	0.06	0.00	0.18
11 Audio/Visual	0.17	0.00	0.24	0.06	0.00	0.18
12 Business/Marketing	1.03	0.50	1.37	1.31	1.25	0.53
13 Manufacturing	1.18	0.50	1.40	0.19	0.00	0.37
17 Architecture/Construction	0.61	0.00	0.94	0.38	0.00	0.88
18 Agriculture	0.89	0.00	1.37	0.19	0.00	0.53
19 Human Services	0.03	0.00	0.15	0.00	0.00	0.00
20 Transportation	0.24	0.00	0.51	0.00	0.00	0.00
21 Engineering	0.18	0.00	0.30	0.00	0.00	0.00
22[b] Miscellaneous CTE	1.63	1.00	1.62	2.94	3.25	2.11

[a]Content area designations are based on the SCED Code system (National Center for Educational Statistics, 2007). CTE areas that had an average enrollment of '0' for both entitled and general education students were not included in this chart. [b]Miscellaneous CTE includes courses that were coded as "miscellaneous" using the subject area designation portion of the SCED Code but are considered to be CTE courses using traditional definitions of CTE (i.e. Gordon, 2008) including work experience and family and consumer science coursework.

Students who had only academic goals earned an average of 8.54 CTE credits while students with only behavior goals earned 9.30. Students who had both academic and behavior (mixed) goals addressed on their IEP earned an average of 9.05 CTE credits. Medians show a similar trend with 8.5 credits for students with only academic goals, 10.5 credits for students with only behavior goals, and 9.25 for students with both types of goals. Figure 5 shows the variance in total CTE credits earned for each goal type. As shown, there was little difference in variance between students with only academic goals and students with both academic and behavior goals. Students with only behavior goals, however, showed a larger variance as well as a greater median than the other two categories.

The mean and median numbers of credits earned by each subgroup in each of the CTE areas are shown in the Table 6. Comparing means, differences between student with academic goals and students with behavior goals appear to be most prominent in the areas of agriculture, food, and natural sciences; and miscellaneous CTE, including work experience and family and consumer science, in which students with only behavior goals earn more credits than their peers with only academic goals. Differences were also prominent in the areas of physical, health, and safety education; and business and marketing in which students with only academic goals earn more credits. Students with both academic and behavior goals earn more credits than their peers in manufacturing; and architecture and construction.

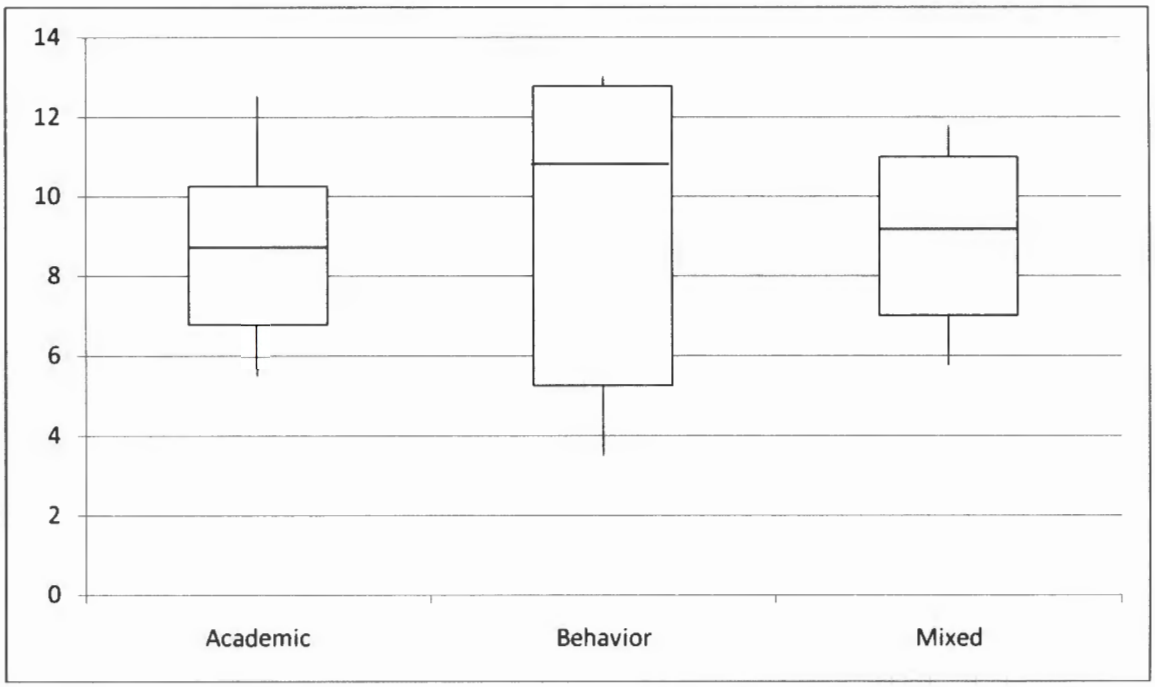


Figure 5. Distribution of Total CTE Credits Earned by Entitled Students Based on Goal Type

Comparing medians, students with only behavior goals earned more credits in computer and information sciences, agriculture, and miscellaneous CTE while students with both types of goals earned more credits in audio/visual technology, manufacturing, and architecture and construction. Students with only academic goals had a higher median number of credits in business and marketing while students with only behavior goals earned fewer health credits than the other two subgroups.

Overall, subgroup analyses indicate that students with less severe disabilities earn more CTE credits than students with more severe disabilities and students with behavior goals earn more CTE credits than students who only have academic goals. The average

Table 6

Mean Credits Earned in CTE Content Areas by Entitled Students Based on Goal Type

	Academic			Behavior			Mixed		
Content Area[a]	Mean	Med	SD	Mean	Med	SD	Mean	Med	SD
08 Health	3.13	3.00	0.40	2.45	2.25	0.51	2.85	3.00	0.38
10 Computer	0.09	0.00	0.20	0.03	0.50	0.27	0.10	0.00	0.22
11 Audio/Visual	0.09	0.00	0.20	0.15	0.00	0.22	0.30	0.50	0.27
12 Business/Marketing	1.26	1.00	1.32	0.60	0.50	0.65	1.10	0.50	1.08
13 Manufacturing	0.76	0.00	1.30	0.80	0.50	0.91	1.40	1.00	1.55
17 Architecture/Construction	0.44	0.00	0.92	0.30	0.00	0.45	1.10	1.00	1.14
18 Agriculture	0.59	0.00	1.34	1.00	1.00	0.79	0.70	0.00	1.30
19 Human Services	0.00	0.00	0.00	0.10	0.00	0.22	0.00	0.00	0.00
20 Transportation	0.24	0.00	0.53	0.10	0.00	0.22	0.00	0.00	0.00
21 Engineering	0.12	0.00	0.28	0.20	0.00	0.27	0.10	0.00	0.22
22[b] Miscellaneous CTE	1.82	1.50	1.70	3.30	4.50	2.17	1.40	0.50	1.78

[a]Content area designations are based on the SCED Code system (National Center for Educational Statistics, 2007). CTE areas that had an average enrollment of '0' for both entitled and general education students were not included in this chart.
[b]Miscellaneous CTE includes courses that were coded as "miscellaneous" using the subject area designation portion of the SCED Code but are considered to be CTE courses using traditional definitions of CTE (i.e. Gordon, 2008) including work experience and family and consumer science coursework.

and median number of CTE credits earned by each subgroup previously discussed is summarized in the Table 7.

Table 7

Mean and Median Number of CTE Credits Earned by Subgroup

Subgroup	Gen Ed	EI	L1	L2, 3	Academic Goals	Behavior Goals	Mixed Goals
Mean	7.27	8.78	9.09	8.03	8.54	9.30	9.05
Median	7.75	9.00	9.50	7.50	8.50	10.50	9.25
SD	2.77	2.57	2.69	1.74	2.09	4.01	2.31

Non-CTE Credits Earned by Students With and Without Disabilities

As described in the methods section, data regarding the number of credits earned in non-CTE areas as well as the number of credits that were attempted but not earned were also recorded. A cursory review of this data along with anecdotal notes taken during the data coding process revealed potential notable differences between students with and without disabilities based on these variables. In order to explore these differences in more detail, these data were also analyzed using the same methods as the previously described data.

The data reveals some important inconsistencies regarding the number of credits earned in non-CTE course areas. While it is encouraging that students with disabilities earn 32% of their credits in CTE as compared to general education students who earn

26% in CTE, it is also important to note the impact on credits in traditional academic areas. Students with disabilities earn 68% of their credits in traditional academic areas (language arts, math, social studies, and science), fine arts, and foreign language, while students in general education earn 74% of their credits in these areas. Table 8 summarizes the mean and median number of credits earned in each of these non-CTE areas for students with and without disabilities. Notable differences appear in the areas of life and physical science; fine and performing art; and foreign language and literature in which students with disabilities earn substantially fewer credits than their general education counterparts.

Important differences in these areas also appear within subgroup analyses. The researcher observed that no students with disabilities were enrolled in instrumental music courses during high school. In addition, students with disabilities earned relatively few fine and performing arts credits in music; most documented credits were earned in art courses. In the area of foreign language and literature, no students who had only behavior goals were enrolled in courses and only one student with both behavior and academic goals was enrolled in a course during high school. In addition, only one student with a WEF of 2 or 3 had enrolled in a foreign language course; almost all of the relatively few foreign language credits earned by students with disabilities were earned by students who only had academic goals and who had a WEF of '1'.

Table 8

Mean Credits Earned in Non-CTE Content Areas by Entitled and General Education Students

Non-CTE Content Area[a]	EI			GE		
	Mean	Med	SD	Mean	Med	SD
01 English/Language Arts	4.33	4.00	1.34	4.04	4.00	0.65
02 Mathematics	3.11	3.00	0.63	3.63	3.50	0.75
03 Life & Physical Science	2.50	2.50	0.77	3.72	3.50	0.66
04 Social Studies & History	3.23	3.00	0.66	3.11	3.00	0.47
05 Fine & Performing Arts	1.66	1.25	1.72	3.83	3.00	2.98
06 Foreign Language & Literature	0.46	0.00	0.93	2.28	2.00	1.26

[a]Content area designations are based on the SCED Code system (National Center for Educational Statistics, 2007). Non-CTE areas that had an average enrollment of '0' for both entitled and general education students were not included in this chart.

Courses Failed by Students With and Without Disabilities

Thus far, data analyses have only included the number of credits earned by students with and without disabilities; it is also important to consider the number of students who failed a course during high school. Table 9 summarizes the percentage of students in each subgroup who failed at least .5 credits during high school. The data indicates that more students with disabilities are failing coursework during high school than general education students, 11% for students in general education compared to 37% for students with disabilities. This problem appears to be especially significant for

students who have behavior goals, whether only behavior goals or both behavior and academic goals, 60% of whom failed at least .5 credits during high school. It is also noteworthy that fewer students with more severe needs failed courses than students with a WEF of '1'.

Table 9

Percent of Students Failing Courses

Subgroup	GE	EI	L1	L2, 3	Academic Goals	Behavior Goals	Mixed Goals
Failed Any Course	11%	37%	47%	13%	24%	60%	60%
Failed Any CTE Course	4%	30%	37%	13%	24%	60%	20%
Failed Any Non-CTE Course	11%	33%	42%	13%	24%	40%	60%

Note. Percentages presented in the table represent the percentage of students in each subgroup who failed at least .5 credits in the specified content area.

CHAPTER 5

DISCUSSION

CTE is recommended as a component of a transition-focused education for students with disabilities. Research indicates that individuals with disabilities often lack occupational, vocational, and employability skills and have difficulty maintaining employment and independent living. The studies previously discussed indicate that completion of CTE programs are associated with improved transition outcomes for students with disabilities and are a crucial component of a transition-focused education. This study sought to determine whether or not CTE enrollment patterns were similar for students with and without disabilities in these three districts.

Overall, students in these districts who are entitled to special education services earn more CTE credits than their peers in general education. This is true for both total CTE credits earned, with EI earning a higher mean and median number of total credits, and percentage of total credits earned. This finding is consistent with the best practice recommendations presented earlier in this study which support the inclusion of CTE in the curriculum for students with disabilities in order to promote post-secondary success.

While the data indicates that students with disabilities, on average, earn more CTE credits than their general education peers, it is important to note that students with more severe disabilities have the fewest CTE credits earned when compared to other students with disabilities. In addition, the median number of credits earned by these students is, in fact, lower than the median number earned by general education. Students in these districts with weighted enrollment factors of '2' or '3' earned the fewest credits

when compared to others with disabilities and fewer than general education students. This is troubling because individuals with more severe needs are less likely to attend and graduate from college or technical schools, and are more likely to be unemployed (National Organization on Disability/Louis Harris & Associates, Inc., 2004). It is reassuring to note that the students with more severe needs are earning approximately the same number of credits as general education students, not significantly fewer.

While CTE is an important and valuable part of the transition focused program for students with disabilities, and indeed all students, educators must also take care to ensure adequate preparation in non-CTE areas. The data from this study indicates that students with disabilities are generally uninvolved in the fine and performing arts, and foreign language, and earning significantly fewer credits in science courses. These curriculum deficits may be limiting the prospects for individuals with disabilities. This may be partially due to the fact that students with disabilities are taking more CTE courses than their general education peers and, therefore, have fewer opportunities to schedule non-CTE electives.

The data also indicates a discrepancy regarding successful completion of coursework showing that more students with disabilities in these districts failed courses than their peers without disabilities. This is a somewhat troubling trend as one purpose of special education is to provide appropriate accommodations and modifications to allow students with disabilities access to a free and appropriate public education and success in the least restrictive environment (Iowa Administrative Rules of Special Education 41.116(4) (a) (1)). This finding may indicate that students with disabilities are not

receiving appropriate accommodations or modifications to allow success in general education. It may also be an indicator of the increasing discrepancy in the academic skills of students with and without disabilities as they progress through their educational career as described by the Center on Education Policy (2009).

As identified in Chapter 2 of this study, CTE is a crucial component of the transition focused program of study for students with disabilities in our secondary schools. Consistent with these recommendations, this study indicates that, in these districts, students with disabilities generally earn more CTE credits than their peers without disabilities. It is important, however, to consider other aspects of the program including the quality of transition plans, membership of IEP teams, content and methods used in the CTE coursework, and the relationships between IEP goals and identified transition needs and services which were not explored by this study.

Limitations

The primary limitation of this study is the small, relatively homogeneous sample. The research was conducted using students from three school districts located in rural areas located within the same state. In addition, it represented data from one graduating class. The research is also limited by the small sample size of 54 students.

The sample of student involved in the study lends suspicion to statistical analyses and makes generalization impossible. This is especially true for subgroup analyses in which some sample sizes were less than 10. As described in the results section, many standard deviations are greater than their associated means indicating a large positive skew in the data with many students earning few credits. For this reason, both means and

medians are used to provide a more accurate representation of the data. This research can be viewed as a valid representation of this population, but generalization of the results is discouraged without future research and replication.

Additionally, the differences between the mean and median credits earned in some of the academic areas suggest a positive skew in the data as well as a floor effect. This reflected a finding that many students took no courses in these areas and some students inflating the mean score by taking a relatively large number of courses.

Need for Future Research

This study and past research indicate multiple directions for future research needs. Most importantly, in order to verify the findings of this small scale study, replication is required. Future replication using larger samples from a more diverse set of school districts will determine whether or not the findings from these districts are representative of the trends in the broader population. A larger data set will also allow for more complex and accurate statistical analysis, and generalization.

Despite the limitations, this study provides a foundation for future research by describing an efficient and effective procedure for studying involvement in CTE programming and comparing students with disabilities to students without. This is a procedure that can be used at a local level so that districts can better inform their own practices, at a state level to inform policy, or by a researcher to provide scholarly information to the field.

The results of this study suggest other areas for which further study is needed. For example, further research should focus on explaining the differences in CTE involvement

between students with and without disabilities. It is reasonable to assume that the differences are a result of any combination of influence from peer groups, educators, parents, social and economic factors, a desire for more applied and 'hands-on' educational programs, or a variety of other factors. Related to this, further exploration regarding the differences in the number of credits failed by students with and without disabilities is warranted. Future research may explain not only the differences found between students with and without disabilities, but also differences found within subgroups.

This study indicated that students with disabilities in these districts are taking more CTE credits than their peers without disabilities. The large number of CTE courses may limit these students' opportunities to enroll in other types of elective coursework including fine arts and foreign language. While this study assumes that students with disabilities should earn a similar number of CTE credits when compared to students without disabilities, it is unclear whether or not earning more credits is necessary or how many credits are ideal. Further research could further inform programming for students with disabilities and determine whether CTE credits may be more beneficial or important for students with disabilities than other types of electives.

Additionally, future research may need to explore other components of the recommendations discussed in Chapter 2 of this study. This may include the quality of transition plans and programming, IEP team processes related to transition, and transition related IEP goals. In addition, study may be needed to further determine which types of

CTE, with regards to both subject matter and method of delivery, are most effective and meaningful for students.

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